



On the political economy of minority rights.

Three ways to manipulate a minority: goals, rules, and border poles

BENGT-ARNE WICKSTRÖM

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On the political economy of minority rights. Three ways to manipulate a minority: goals, rules, and border poles*

BENGT-ARNE WICKSTRÖM[†]

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Abstract

Language rights for speakers of minority languages are analyzed as well-defined policy measures that are implemented in given jurisdictions. For the implementation of such rights in some countries, certain rules concerning the number and geographical distribution of the speakers of a minority language have to be fulfilled. We discuss, how a policy maker with a given attitude towards the minority can manipulate the policy to further his or her goals.

We first provide a normative background for this type of language policy, a benchmark, analyzing language policy on the basis of welfare economics, first discussing why language policy is but one type of public policy, then defining and discussing the benefit or “demand” side assuming that benefits are basically proportional to the number of beneficiaries of the planning measure. We then argue that the costs of a planning measure can be described as a function of two variables “number of beneficiaries” and “size of area of application”. This lets us analyze planning measures in a two-dimensional model fully characterized by the number of beneficiaries and their geographical distribution in the jurisdiction under consideration. Finally, we characterize the optimal size and extension of the jurisdictions where the language rights are to be implemented.

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[†]Andrássy-Universität Budapest
Email: bengt-arne.wickstroem@andrassyuni.hu

It is then shown, how the policy maker can manipulate the goals of the policy, the implementation rules, as well as the borders of the jurisdictions in order to achieve her or his political goals when they differ from the cost-benefit optimum.

1 INTRODUCTION

In order to sensibly discuss the effects of a politically motivated language policy, it is necessary to have a normative benchmark with which the policy outcomes can be compared. Our benchmark in this essay is (Pareto) efficiency. This can be modified into cost efficiency to take the policy maker's preferences for discrimination into account. Policy alternatives and actual policy observed will be compared to these benchmarks. We argue that the policy maker has several instruments at his or her disposal for manipulating, positively or negatively, the well-being of members of a minority. We will show that although a cost-efficient discriminatory policy is possible, taking the preferences for discrimination of the policy maker into account, the most common instruments as a rule do not lead to cost efficiency. We will argue that "efficient" discrimination might be politically unacceptable, whereas formally fair rules leading to inefficient indirect discrimination of comparable magnitude might be met with less political resistance.

We will first in this introduction discuss why language policy measures form a natural part of public policy. Then, we show how the efficiency benchmark relates to concepts of justice based on equal treatment, arguing that efficiency and equity in general are only possible with compensations payments from members of the majority to the those of a minority. This is hardly found in reality. Finally, we discuss how to make the benchmark operational with the help of simple cost-benefit analysis and how to incorporate efficient discrimination into this analysis.

1.1 THE TRADE-OFF BETWEEN JUSTICE AND EFFICIENCY

One may ask why language policy is a matter of public policy, at all. There are at least three types of answer to this question: market failure and efficiency, government as a legal monopoly, as well as justice and distribution. Throughout the essay, we take it for given that the policy measures discussed are implemented for the majority language, The question is if they should be implemented also for the minority language.¹

First, market failure is relevant, since many language-policy measures provide goods that are non-rival in consumption, typically the provision of official documents or street signs in a certain language. These are pure "collective" or "public" goods, and the market does not provide these goods efficiently. On the other extreme, we have goods that are (almost) perfectly rival in consumption, but display high fixed costs. Elementary education would be an example.² Here,

¹ In the first two reasons for public language policy discussed here, market failure and legal monopoly, the argument for public-sector provision is the same for the minority and the majority. The distribution argument is not. Here, the question is if the government should support the minority, in order to give it the same standard of living in the relevant areas, if the market does not do this. Elementary education might be such a good, see below. Also laws requiring information to be provided in a minority language on consumer-good packaging would fall into this category if the producers would not find such labeling profitable due to the market behavior of the minority. These latter cases are not relevant to this essay, since we will use efficiency as our benchmark; the distribution argument will hence play no rôle in our discussion beyond this introduction.

² Even under the existence of public education in the majority language, adding a school system in an additional language causes additional fixed costs due to the provision of educational material and increased administration. Compare the calculations in DESGAGNÉ and VAILLANCOURT (2016).

we talk of a “natural monopoly”, which is also an argument for government interference in the market. There are a number of intermediate cases between these two extreme ones that are all examples of cases where the market would fail. In general, if the costs of provision of a certain language-related good can be described by a concave function of the number of beneficiaries, the market fails to provide an efficient allocation.³

Second, there are a number of activities where the government enjoys a legal monopoly, such as national defense, taxation, judicial system etc. In many instances it follows that at least some information for the public about these activities is also a task of the government. Some such communications, like public announcements, are clearly non-rival in character and fit the first reason above. However, there is also information that is directed towards single individuals, like information about the taxes the individual should pay. Such communications cause costs that are more or less proportional to the number of letters (or mails) sent out. The cost structure is rival which would be an argument for a market organization of the provision of this type of information.⁴ However, due to the legal monopoly of the government, it is the authoritative source of certain information. Therefore, the language use in such communications is also an issue to be decided in the public sector.

Finally, government intervention can be justified on distributional grounds, if there is a goal of society that each citizen ideally should have the same access to public life using a language of his or her choice. As an example, consider elementary education. If it is left to the private sector, the fixed costs would have to be divided by the beneficiaries. A big majority would face relatively low *per capita* fixed costs, whereas for a small minority they could be rather high. Private schools in the minority language would be more expensive than in the majority language *per capita*. A government concerned with fairness or equal treatment of all citizens would then have to support schools in minority languages.

A condition for the (Pareto) efficient provision of any good, is that the relevant propensities to pay of the beneficiaries exceed or equal the relevant costs of provision.⁵ This can be reformulated: the average propensity to pay of the beneficiaries should exceed or equal the *per capita* costs of provision for everyone.⁶ In the case of non-rival goods (or, more generally, if the cost function is concave in the number of beneficiaries), this condition is more likely to be

³ For a detailed discussion of the market-failure argument, see WICKSTRÖM, TEMPLIN, and GAZZOLA (2018) or WICKSTRÖM, GAZZOLA, and TEMPLIN (2018).

⁴ In many cases, like providing information about tax regulations, private firms (in this case tax advisers) successfully compete with the government offices in providing good information – and in many languages.

⁵ Of course, if the goods resulting from the policy measures are complementary or substitutes, we would have to take this into account in finding the efficient allocation of language-policy measures, and the condition would only hold in a general equilibrium, which might not be unique. This, however, does not effect the points made in this essay and is therefore not taken into further explicit consideration.

⁶ For a perfectly non-rival good we get the Samuelson condition that the sum of individual propensities to pay equal or exceed the costs of the provision of the good. Since we treat the policy measures as discreet goods, we have to talk about discreet propensities, not marginal ones. The issue of the “size” of the good is mainly a practical issue. A government can only operate with a limited number of measure. Theoretically we could divide the measures in several smaller ones and in this way approach continuous goods. For instance, street signs in the minority language could be introduces on major avenues (measure 1), on big streets (measure 2) on smaller streets (measure 3), etc. That way the measure “street signs” has become more differentiated and comes in three or more sizes. How specific measures should be is an optimization problem *per se*. The more differentiated they are, the closer are we to a welfare optimum, but the higher are the administrative costs of the implementation.

met by a big group of beneficiaries than by a smaller one. In the case of a rival good without fixed costs in the provision, the condition is equally likely to be satisfied in small and large groups. Since most language-policy measures display a certain degree of non-rivalry or cause some fixed costs in the provision, many language-related goods can not be efficiently provided for small language groups. For which measures and for which groups this will be the case depends on the aggregate value the members of the language group attach to the measures, which in turn depends on the numeric strength of the group. If we define justice as equal treatment⁷ in the sense that every individual in a society should face the same rights and possibilities to use his or her preferred language in any given situation that can be regulated by public policy,⁸ then it is clear that an efficient language policy will cause disadvantages to smaller groups. This happens because many measures are not efficient if the number of beneficiaries is below a certain minimum level. A member of the majority would enjoy more measures than a member of the minority.⁹ This violates equal treatment with respect to language use.¹⁰ A (Pareto) efficient allocation of language rights will, hence, be unfair to the minority since the members of the majority will have more opportunities to use their language than members of the minority. The remedy would be to compensate the members of the minority for their disadvantage. If the compensations are big enough, this could lead to a situation that is both efficient and equitable. This is, however, rarely observed in reality. Our general benchmark is then (Pareto) efficiency without any compensation to members of the minority for unequal treatment caused by the smaller size of the minority in comparison to the majority.

The policy maker representing society might want to give some weight to equity or might want to discriminate against the minority, however. Even if he or she could estimate the average propensity to pay for a policy measure perfectly, the policy maker can decide to operate with a higher value (favoring the minority) or a lower value (discriminating against the minority). Substituting the preferences of the policy maker for the aggregated propensities to pay of the beneficiaries, we can define efficiency conditional on these preferences. We will then talk about *cost efficiency*. That is, a cost-efficient policy measure is an efficient measure for a given set of preferences of the policy maker, which does not necessarily reflect the preferences of the beneficiaries of the measure.

⁷ We note that equality is not a relevant concept, since in a situation with only one official language, we have formal equality. Everyone has the right to use this one language. This, of course, does not capture our concern that everyone be allowed to use the language of his or her choice. Our formulation catches the idea behind freedom from envy and fairness in the sense of FOLEY (1967) and VARIAN (1974).

⁸ For further discussions, see also WICKSTRÖM (2007), WICKSTRÖM (2010), and WICKSTRÖM (2015).

⁹ The situation is equivalent to the provision of any (discrete) collective goods. Assume that 80% of the population want good *A* and 20% good *B*, and that the cost of provision is the same. If the Samuelson condition will be satisfied for good *A* but not for good *B*, the only Pareto-efficient allocation is the provision of good *A*, but not of good *B*. From an equity point of view, this is unfair to those wanting good *B*. This unfairness could be reduced or eliminated through transfer payments from those preferring good *A* to those wanting, but not receiving good *B*. That is, a second-best policy under the restriction of no compensations is unfair; a first-best policy with compensations can be both efficient and fair. That the provision of good *A* is efficient remains unaffected by the possible compensations, however (unless some very strong income effects were to occur, which we neglect).

¹⁰ That perfectly equal treatment is impossible in the reality of modern societies should be obvious to anyone; just imagine having street signs in a city like Brussels in all preferred languages of Brussels's residents. The budget of the city would be exhausted and there would be nothing left for other desired public measures like street cleaning or the provision of hospital beds (ignoring the effects on the facades of the beautiful buildings). The opportunity costs, which also originate in the preferences of the residents, would be enormous.

In conclusion, fairness is not treated explicitly in this essay. The benchmark against which we evaluate actual policy is (Pareto) efficiency. Distributional considerations can only enter implicitly through the policy maker's choice of β , in which case we talk about cost efficiency. The distributional preferences of the policy maker can be both in favor of the minority and against it. A central argument is that policy rules adopted in reality generally lead to results that differ from efficiency, be it with or without distributional considerations. Further, the policy often results in allocations that are unfair in a different sense: different members of the same minority are treated differently without any plausible ground.

For the sake of completeness it should be noted that there are other approaches to linguistic justice than this “demand” (or preference) approach based on traditional welfare economics. A “need”-based approach is the use of “linguistic disenfranchisement”, the fraction of the population that is unable to communicate with the government in the official language(s), in many publications by Ginsburgh and coauthors, see for instance GINSBURGH, ORTUÑO-ORTÍN, and WEBER (2005) or GINSBURGH and WEBER (2005); a similar approach is also found in GAZZOLA (2016). These studies regard language just as a means of communication, thereby neglecting language as an important part of the human identity. We, on the other hand, look at the right to use a language of your choice as a good over the consumption of which the individual has preferences just like over the consumption of any other good.

1.2 OPERATIONALIZATION

The obvious tool to use in order to make the benchmark operational is cost-benefit analysis. In the literature on language planning and policy, the benefit side, or the “demand” for public policy, is well developed.¹¹ The costs of language policy, on the other hand, are often neglected.¹² We will in this essay assume the demand to be quantified by the political process to which both the majority and the minority population contributes.¹³ The essay investigates how a policy maker aware of the different cost structures of policy measures and with different preferences (*per capita* values attributed to the measure) based on the political process will act. The outcomes are compared to the benchmark. The focus is on the practical implementation that the policy maker finds expedient for the policy measures.

The policy can be both favorable and unfavorable to the minority. With one exception we will discuss cases where the minority language is always in the second place behind a dominant state language independent of the local situation. The exception is Finland where the minority and majority languages are treated symmetrically. We will concentrate on three instruments of the policy maker:

1. The purpose of the policy (the “goals”) is to improve the situation of members of the a minority compared to the absence of the policy. This is made operational through the definition of the *per capita* benefits of the policy and should ideally reflect the propensities

¹¹ See, for instance, GAZZOLA (2014), GAZZOLA and GRIN (2017), or GRIN (2003), and the references in those contributions.

¹² For a notable exception, see the work of François Vaillancourt and coauthors, for instance, VAILLANCOURT (1997), DESGAGNÉ and VAILLANCOURT (2016), or VAILLANCOURT (2018).

¹³ The mechanisms determining the policy demand defined in this way are taken as given in this essay. Of course, there are many interesting issues here; see, for instance, CORNEO and NEHER (2015) or BISIN and VERDIER (2017).

to pay of the affected individuals. However, as a rule these benefits are determined by the political process. This can lead to “too small” or “too large” values of the *per capita* benefits fixed by the policy maker, in turn making the minority better or worse off.¹⁴ The policy will be cost efficient, though.

2. The choice of implementation criteria (the “rules”) – for instance a requirement that the size of the minority or its fraction of the total population exceed certain critical values for policies to be implemented – as used by the policy maker necessarily leads to an approximate fulfillment of the benchmark case due to practical expediency even if the *per capita* benefits are optimally chosen. The consequence of the choice of rule can be good or bad in the eyes of a member of the minority, though. Further, the rules defining if a measure is to be implemented or not can consciously be chosen by the policy maker to be in favor of minority rights or not.
3. The structure of the jurisdictions (the “border poles”) within which the policy is implemented – given the implementation criteria – can be chosen so that it gives more or less rights to a minority, marginalizing or strengthening it.

We will show, how the three instruments – the goals, the rules, and the border poles – can be used by a policy maker to discriminate against – or in favor of – the members of a minority. Discrimination here means conducting a policy whose results are far removed from our ideal benchmark case. We illustrate the discussion with real examples from different European countries. We show, how the policies used in the cases considered lead to inefficient discrimination of (some members of) minorities. Of course, we cannot read the minds of the policy makers and, hence, do not know their intentions. The treatment of minorities is not the only concern of modern states and the policies might be motivated by other, totally different, concerns, and the discrimination of individuals belonging to a minority is simply “collateral damage”.

We will argue that the political determination of “too low” or “too high” individual benefits is overtly discriminating, but cost efficient, whereas the various rules and the structure of jurisdictions are formally non-discriminating, but inefficient and *de facto* discriminating. In a formal constitutional-political environment it is, hence, to expect that the latter two types of policies will be politically easier to motivate than the manipulation of politically determined benefits.

In the next section 2 we present an approach to language planning based on simple cost-benefit considerations and operationalize the benchmark case. In section 3 the three instruments considered are discussed. First, in subsection 3.1, the consequences of the determination of the *per capita* benefits are analyzed; then, in subsection 3.2, a sensible rule emerging from the benchmark case is compared to the “percentage” rule and to the “Finnish” rule. Finally, in subsection 3.3, it is shown how the policy maker can influence the rights of a minority through the drawing of jurisdictional borders or through migration policies. Section 4 concludes the essay.

¹⁴ In addition to the practical difficulties in measuring the propensities to pay – or the contingent evaluation – (see GINSBURGH, 2017) the concept is not well-defined. The Scitovsky paradox (see SCITOVSKY, 1941) or other path dependencies are more than likely to occur in minority policies, since many policy measures are either complements or substitutes. With our definition of how benefits are quantified – through political decisions – this is of no consequence, though.

2 AN ECONOMICS APPROACH TO LANGUAGE PLANNING

Efficiency is a key concept in economics. In any economic analysis, allocative efficiency plays a central rôle as a guide to choosing between possible alternatives. In this essay, as noted above, we will concentrate on this allocation, or efficiency, aspect, applying a cost-benefit approach to language policy.¹⁵ The “benefits”, however, are given by the political process and do not necessarily reflect the “well-being” of the members of the minority (however defined).

2.1 NOTATION AND TERMINOLOGY

We define a *language-planning measure* as the smallest unit of language policy.¹⁶ The cost of implementing the measure is c , and the number of its potential beneficiaries is n . The spatial size (area) of the jurisdiction of implementation is denoted by a . A *language policy*, of course, consists of several individual measures that can be bunched together into several *categories*. That is, there are three levels to the language policy. On the lowest level is the policy measure, on the next level are the categories each consisting of similar measures in some sense, and on the top level is the language policy consisting of several categories. In the laws of different countries, one can find terms like “official language”, “national language”, “working language”, and others. Each such definition can be seen as a category, a set consisting of several planning measures. The problem of finding an optimal set of categories and defining the measures that belong to each category is both interesting and complex.¹⁷ For our purposes, however, we can neglect this aspect and concentrate on the properties of one single measure.

The *per capita* benefit (expressed in monetary terms) of the measure is given by β . This is usually identified as the “propensity” (or “willingness”) to pay. The net benefit to society of introducing the measure in the jurisdiction under consideration is then the difference between gross benefits and the costs of providing the measure:

$$u := \beta n - c \tag{2.1}$$

The net benefit u is the basis for evaluating the planning measure. This makes comparisons of different measures and the setting of priorities possible. This is our benchmark.

2.2 COSTS

We first focus on the structure of costs. For each planning measure we require that the resulting goods be available to each beneficiary in the same way and then describe the costs as a function of the number of beneficiaries n and the area of application of the measure a . A perfectly non-rival good (for instance the use of the minority language in public decrees or on street signs)

¹⁵ See also WICKSTRÖM (2016).

¹⁶ Some examples of such measures are the use of a minority language in official documents, like in passports, on money bills, and in laws and decrees, the provision of bilingual street signs, the introduction of a right to receive public services in a minority language, the provision of education in a minority language, etc. We will only consider measures of this kind, where all measures considered are introduced for the majority language and the policy maker will have to decide on their introduction also for the minority language. There are a number of measures with the two languages in direct competition, for instance the number of performances in each language in the one and only National Theater or the number of hours allocated to each language in the one and only national broadcasting service. Such measure are not treated in this essay.

¹⁷ For a discussion of the aggregation problem, see WICKSTRÖM (2017).

will then only cause fixed costs and a perfectly rival good will give rise to a proportional (or affine, if there are fixed costs) cost structure. Health services or public education in a minority language, although not perfectly rival, are practical examples of goods that display a fairly high degree of rivalry. These goods as well as any other good displaying less than perfect non-rivalry (some positive economies of scale in consumption) will lead to a concave cost structure in the n -dimension.¹⁸

Also in the spatial dimension there can be different economies of scale. For a perfectly non-spatial good (for example the use of the minority language in public decrees or information provided in the internet or from a call center) the size of the jurisdiction doesn't matter for the costs. A perfectly spatial good (for instance, street signs in a minority language or home health services in a minority language), on the other hand, will give rise to a more or less proportional (or affine) cost structure. Again, these goods as well as goods displaying some, but less than perfect spatiality (some positive economies of scale in space) will lead to a concave cost structure in the a -dimension.

In general the intermediate cases with various degrees of economies of scale in the number of beneficiaries (n) and the size of the territory (a) (which includes the cases with fixed costs) seem to be most likely. We write the costs of a certain policy measure providing language rights of a certain quality to all beneficiaries as a (sufficiently differentiable) concave function $c(n, a) \geq 0$, defined for $n \geq 0$ and $a \geq 0$ and non-decreasing in n and a . Of course, concavity implies that $c(n, a)/n$ and $c(n, a)/a$ is non-increasing in n and a , respectively.

Let β be the *per capita* benefit of the planning measure. Then the planning measure has a non-negative benefit-cost difference if $\beta n - c(n, a) \geq 0$. It is convenient to make a change in variable, defining $\delta := n/a$, the geographical density of the minority population. The condition for the measure to be efficient now becomes:

$$\beta n \geq c\left(n, \frac{n}{\delta}\right) \quad (2.2)$$

2.2.1 The efficiency frontier

Expression 2.2 allows us to move the analysis to a very simple diagram in the $(n - \delta)$ -space. Each point in the diagram describes a possible jurisdiction characterized by a minority population of size n with geographical density of size δ . Expression 2.2 defines two areas of the diagram separated by a curve, the efficiency frontier, such that for jurisdictions whose characteristics are given by parameter values above and to the right of the efficiency frontier the measure is efficient and, correspondingly, for values of n and δ below and to the left it is not efficient. Due to the concavity of the cost function, the efficiency frontier can be easily characterized:

PROPOSITION 1 The efficiency frontier of a planning measure is either a constant value of n or of δ or it displays a trade-off between the number of beneficiaries of the planning measure n and their spatial density δ in the jurisdictions under consideration.

A proof is provided in the appendix.

¹⁸ For a more detailed discussion of the various types of goods resulting from language planning the reader is referred to WICKSTRÖM, TEMPLIN, and GAZZOLA (2018).

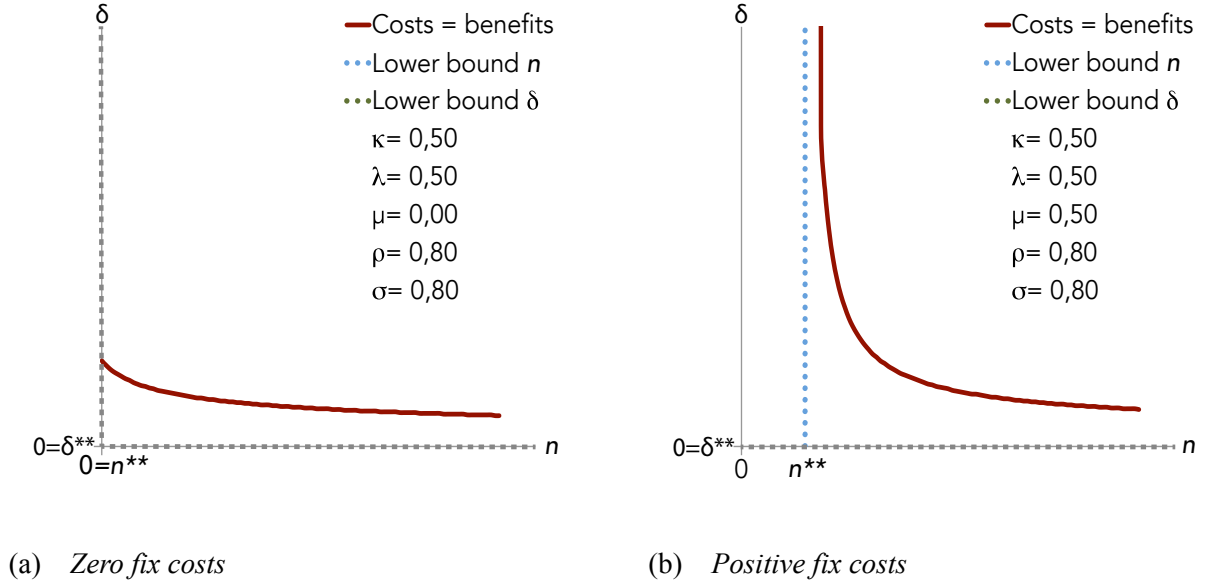


FIGURE 2.1 Efficiency frontiers, determining the characteristics of jurisdictions where the planning measures is efficient and inefficient

In figures 2.1a and 2.1b an example of the efficiency frontier is shown for a certain policy measure with and without fixed costs. In order to draw the diagrams, the cost function has been normalized with respect to β and specified as:

$$\frac{c\left(n, \frac{n}{\delta}\right)}{\beta} = \kappa [(1 - \rho + n)^\rho - (1 - \rho)^\rho] + \lambda \left[\left(1 - \sigma + \frac{n}{\delta}\right)^\sigma - (1 - \sigma)^\sigma \right] - \mu \quad (2.3)$$

This cost function seems to be the analytically simplest one that is additively separable in concave functions of n and a . The parameters ρ and σ are closely related to the concavity of the dependency of the costs on n and a . For a non-rival good $\rho = 0$ and for a rival one $\rho = 1$; similarly for a spatial good $\sigma = 1$ and for a non-spatial one $\sigma = 0$. The parameter μ captures the fixed costs and κ and λ the (relative) importance for the costs as function of the variables n and a ; κ is the marginal cost of an additional member of the minority if the planning measure provides a perfectly rival good, and λ is the marginal cost of an increase in the area of the jurisdiction in the case of a perfectly spatial good. In jurisdictions characterized by values of the total size n and geographical density δ of the minority population northeast of the efficiency frontier the planning measure is efficient, and in jurisdictions with n and δ to the southwest the measure is inefficient.

In the diagrams, the lower bounds on the variables n and δ are indicated by the asymptotic values n^{**} and δ^{**} of the variables n and δ . If n or δ lay below one of these values, of course, the planning measure cannot be efficient. Unless the fixed costs are zero, the lower bound of n is always positive. There is always a positive number of beneficiaries that has to be present in order for the language planning to be efficient. At least the fixed costs have to be covered.

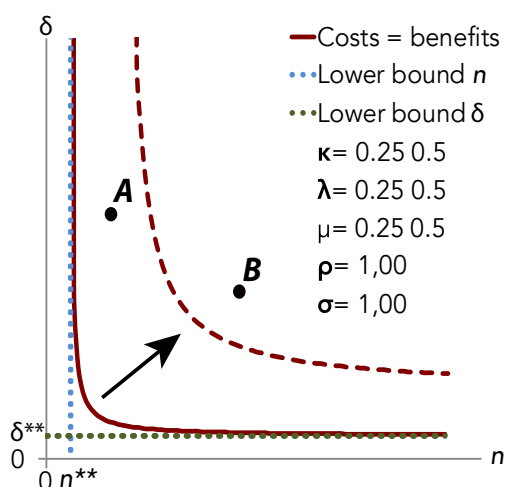


FIGURE 3.1 Planner reducing β by 50%

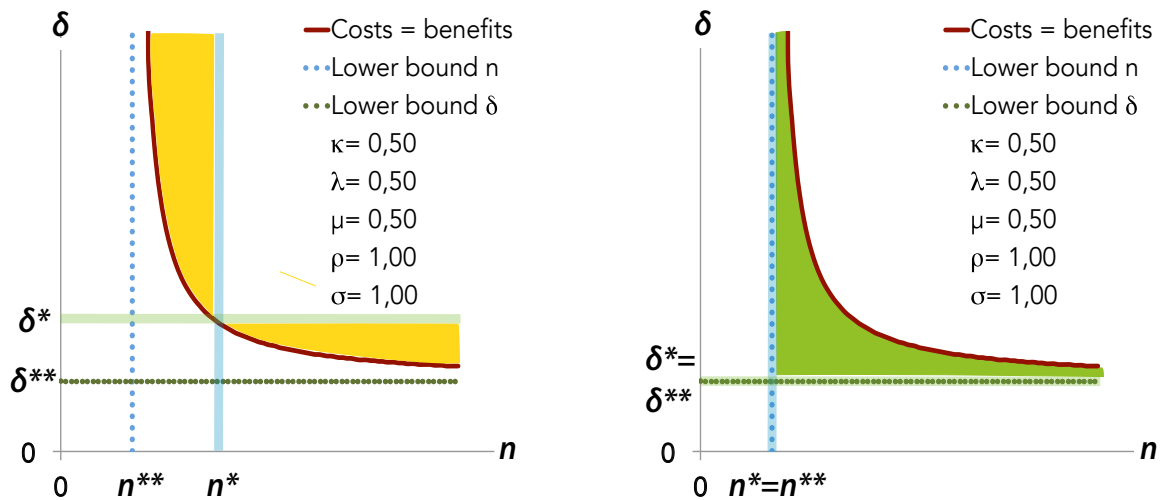
3 INSTRUMENTS OF THE PLANNER

We will discuss three instruments of the planner: the setting of the goals through the quantification of the *per capita* politically determined benefits of the minority, the choice of the decision rule for the implementation of the planning measures, and the choice of the population structure in the jurisdictions under consideration, which can be achieved by migration or changes in the borders.

3.1 CHOICE OF GOALS

As noted above, the costs are as a rule objectively measurable, whereas benefits are not. The planner can set the benefits virtually at will, specifying them as national goals. Motivations for not trying to reflect the preferences of the minority members (their propensities to pay) can be of many different kinds. It can be outright discrimination against a minority, it can be “nation building” favoring one ethnic group at the costs of another, it can be justified by reversing old privileges of members of the minority if they were the old rulers, etc.

The resulting efficiency frontiers will be further away from the origin if the politically determined *per capita* benefits are lowered. This is illustrated in figure 3.1. In the figure, the policy maker sets the benefits of the measure to half of the benchmark case moving the efficiency frontier in the northeast direction, thereby making the policy measure that would be sensible in the benchmark case for both community A and community B, not to fulfill the criterion for implementation in community A. Note that we can still talk about a cost-efficient policy, given the preferences as they are reflected in the *per capita* benefits used. The “politically acceptable” argument for this type of discrimination is, as mentioned above, an effort at nation building or



(a) Exclusion error

(b) Inclusion error

FIGURE 3.2 Types of error by two-parameter language planning

the like.¹⁹

Although it is cost efficient, it is also overtly discriminating in that it does not attempt to respect the intensities of the preferences of the minority population. Hence it is readily opening itself up to criticism from external sources. In most cases it is, hence, not politically expedient and a policy maker who wants to convey an impression of being non-discriminatory would probably like to avoid it, looking for formally non-discriminatory ways of discrimination.

3.2 DECISION RULES

Even if for every planning measure one could find the efficiency frontier and determine whether the minority-population density and the number of beneficiaries lay above or below the efficiency frontier in the jurisdictions under consideration, in most cases it is convenient to have rules-of-thumb for introducing planning measures. Our analysis above clearly implies that such rules could build on a combination of critical values of both variables, n and δ . The simplest rule would be that both the number of beneficiaries and the minority-population density reach some indicated values in the jurisdictions under consideration.²⁰ If the frontier shows a trade-off between n and δ , a combination of critical values can lead to inefficient results. If a planning measure that is efficient in a certain jurisdiction is rejected, we talk of an *exclusion error*,²¹ and if an inefficient measure is accepted, of an *inclusion error*.²² See figure 3.2. In figure 3.2, the

¹⁹ Compare the treatment of the Russian minorities in the Baltic states. After the fall of the Soviet Union, nation building activities of various intensities began in the newly created independent nations. In the Baltic states – with strong Russian-speaking minorities – these activities were especially intensive. As a consequence the rights of the Russian speakers with respect to the use of their language were curtailed. See, for instance, GALBREATH (2005).

²⁰ In some cases, the efficiency frontier will be vertical and in some cases horizontal. A correct critical value of n or δ , respectively, will in these cases give an exact criterion for efficiency of a given measure.

²¹ This is traditionally referred to as an error of type I.

²² This is traditionally referred to as an error of type II.

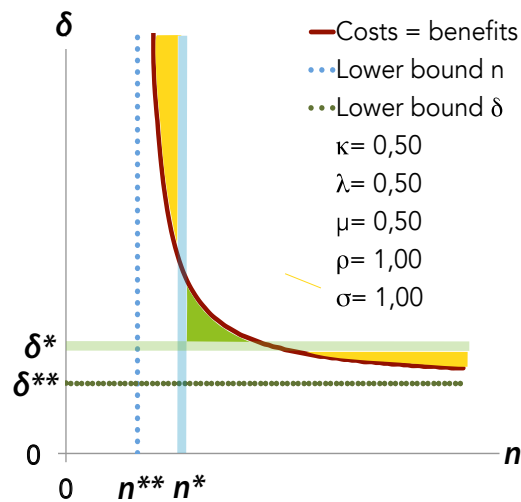


FIGURE 3.3 Minimal errors by two-parameter language planning

rule is that n^* and δ^* are the minimal values of n and δ that have to be reached in a jurisdiction for the measure to be implemented. In figure 3.2a, jurisdictions characterized by parameters in the shaded area are jurisdictions in which the measure would be efficient but not implemented – an exclusion error. Similarly, in figure 3.2b, jurisdictions characterized by parameters in the shaded area in this figure are jurisdictions in which the measure would be inefficient but implemented – an inclusion error.

However, a two-parameter rule fixing a minimum of n and a minimum of δ that jointly form a lower limit for the values of n and δ in the jurisdiction considered is probably the best compromise between the optimal benchmark in the form of the exact efficiency frontier and administrative ease of implementation. If the policy parameters, n^* and δ^* , are set too high, we risk an exclusion error, the policy being exceedingly restrictive; see figure 3.2a. On the other hand, if the policy is very accommodating with low values of the parameters, we can end up with an inclusion error, see figure 3.2b. If the errors occur in reality depends, of course, on whether the values of the parameters n and δ characterizing the jurisdictions are in the error zones.

A second-best rule could then be trying to minimize the sum of the potential errors of the two types, see figure 3.3. Again, here the shaded area below and to the left of the efficiency frontier represents inclusion errors and the shaded area above and to the right of the curve exclusion errors. A policy maker wanting to support the minority might give less weight to the inclusion error in this sum, and a policy maker wanting to disadvantage members of the minority would give more weight to the inclusion error than to the exclusion error. In this way, distributional arguments can be made operational in the cost-benefit analysis.

3.2.1 Minority rights in international law

On the general level, international conventions, like United Nations' declaration of minority rights (UNITED NATIONS, 1992), provide no specific rules or regulations. General expressions, like “(traditional) area of habitation” or “substantial number” of the speakers of a minority language, are used. Of course, one could interpret this as density and numerical strength of the

minority population in our sense, but this would stretch the matter a bit too far. Also, the motivation for providing language rights varies. In some cases “need” is the expression used, in other cases “demand”. Need here signifies that an individual only has the right to use his or her mother tongue in case he or she doesn’t sufficiently master the majority language; demand is related to the preferences of the individual irrespective of language skills. Applying the need definition to fully bilingual minorities, like most minorities in Europe, would mean the absence of minority-language rights to members of these minorities.²³

On the next level, we find national laws and regulations.²⁴ We can distinguish two different approaches. In many countries there are *ad hoc* specifications in the legal structure determining both which languages have an official status and in which jurisdiction.²⁵ In other countries there are specific rules determining when a minority language be given some official status irrespective of the jurisdiction. The most common such rule is that the minority make up a certain proportion of the total population in the jurisdiction.²⁶ Other specific rules exist. Finland is a good example. Here, rights are granted if the minority population in a jurisdiction exceeds 8% or 3000 individuals.²⁷

In the following we will analyze the implication of the percentage rule and the Finnish rule. We will see that both rules can lead to absurd results, favoring minorities in scarcely populated areas relative to minorities in densely populated jurisdictions. On the other hand, the Finnish rule is very favorable to minorities whereas the percentage rule opens up for manipulations disadvantaging minorities.

3.2.2 Percentage criterion

As we noted above, a percentage criterion applied in order to grant minority rights is common in many countries. The percentage rule has very different implications in urban and rural areas. It implies a critical value for the density δ of the minority population. Only the density matters; the numerical size n is without consequence. Also, the critical value of the density is different in different jurisdictions depending on the total population density in the jurisdiction.

Denote the percentage of the minority population by π and the total population in the area under consideration by N . Then $\pi = n/N$. Let $\Delta := N/a$ be the total population density. We

²³ For a good overview of international law and language rights, see DUNBAR (2001).

²⁴ An excellent source for the legal status of minority languages in the whole world is LECLERC (2019). Here, one can find the different laws and regulations in French translation and, in many cases, in the original language.

²⁵ In Austria, for instance, there is a decree, REPUBLIK ÖSTERREICH (1977), that regulates the official status of Slovenian in specified jurisdictions. Similar decrees exist for Croatian and Hungarian. In Slovenia the situation is similar. A law, REPUBLIKA SLOVENIJA (2006), regulates the use of Italian and Hungarian in certain given jurisdictions.

²⁶ In Slovakia and Romania, for instance, language laws regulate that the minority has to reach at least a fraction of 15% or 20%, respectively, of the total population in order to be granted minority rights; see SLOVENSKÁ REPUBLIKA/SZLOVÁK KÖZTÁRSASÁG (2012) and ROMÂNIA (2001). In Estonia, the constitution in § 51 states that a member of a minority has the right to address the local authorities and receive answers in the minority language if the minority exceeds 50% of the population in the local jurisdiction; see EESTI VABARIIK (1992). Of course, strictly speaking this is not a minority right on the local level, since it means giving rights to the local majority, which, however, nationwide is a minority.

²⁷ See SUOMEN TASAVALTA/REPUBLIKEN FINLAND (2003).

then find:

$$\delta = \frac{n}{a} = \frac{n N}{a N} = \frac{n N}{N a} = \pi \Delta \tag{3.1}$$

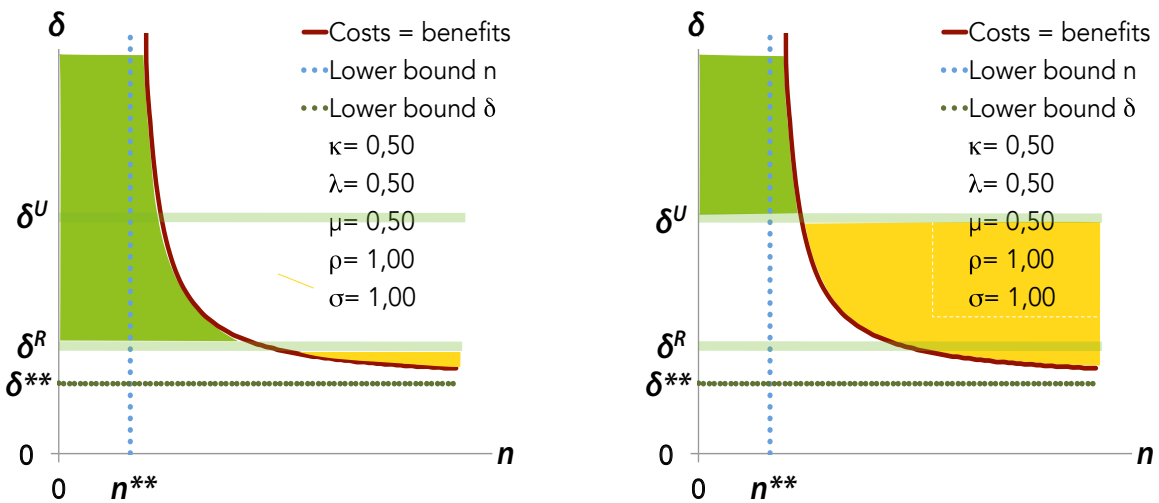
A critical percentage value π^* then implies a critical value of the density of the beneficiaries δ^C :

$$\delta^C = \pi^* \Delta \tag{3.2}$$

Δ varies and is higher in urban areas than in rural areas, $\Delta^U > \Delta^R$. Hence, for a given percentage criterion π^* , also the critical value of δ , δ^C , is higher in an urban than in a rural area, $\delta^U > \delta^R$. This is illustrated in figure 3.4 with inclusion errors represented by the shaded areas below or to the left of the efficiency frontier and exclusion errors by the shaded areas above and to the right of the frontier.

It is evident that the percentage criterion can lead to a large inclusion error in rural jurisdictions and to a large exclusion error in urban ones, see also the following example, section 3.2.4. That is, the rule is fairly generous to a rural minority in comparison to an urban population, where a large exclusion error can threaten the rights of the minority. Since in modern urbanized societies a large proportion of the population – also of the minority population – lives in urban areas, the percentage rule, although formally “neutral” will in many cases deny minority rights to many members of the minority.

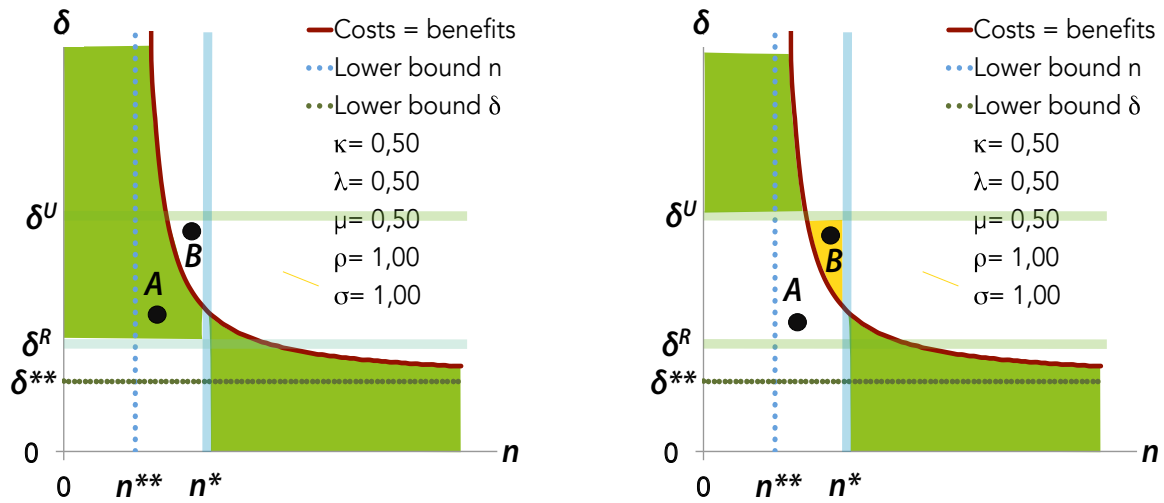
For a policy maker wanting to discriminate against a minority, the percentage rule is a very effective instrument in a modern urbanized society. However, it is a very inefficient discrimination instrument in comparison to lowering the politically determined average benefits of members of the minority community combined with a rule based on δ and n that respects cost efficiency. The percentage rule is formally neutral though, whereas using the determination of average benefits is explicit. Hence, the percentage rule is politically more easily acceptable.



(a) Low total population density (rural area)

(b) High total population density (urban area)

FIGURE 3.4 Errors by percentage-rule language planning



(a) Low total population density (rural area)

(b) High total population density (urban area)

FIGURE 3.5 Errors by “Finnish”-rule language planning

PROPOSITION 2 A percentage rule tends to benefit rural minorities in comparison to urban minorities in an inefficient manner. It can be seen as a redistribution in favor of rural minorities at the cost of urban minorities.

3.2.3 The “Finnish” rule

In Finland there is a double rule, combining the percentage rule and a critical-mass rule in n . Language rights are granted to a minority if its fraction is at least 8% of the total population of a county (*kunta/kommun*) or if its number reaches at least 3000 individuals, see SUOMEN TASAVALTA/REPUBLIKEN FINLAND (2003).²⁸ Since only one of the two criteria has to be satisfied for the policy to be implemented, this is, of course, a much more generous rule for the minority than the rule we have characterized as sensible. This is illustrated in figure 3.5. The occurrence of inclusion errors (jurisdictions in the shaded areas below and to the left of the efficiency frontier) is much more likely than with our sensible rule or the simple percentage rule. Inefficient absurd rankings cannot be excluded, however. The rural community A will in the illustration receive rights (the size of the minority to be sure is below the critical value n^* , but the density of the minority exceeds δ^R) although it is inefficient (below the efficiency frontier), an inclusion error, and the urban community B will be denied rights (the size of the minority is below n^* and its density also falls below δ^U) although it would be efficient (it is above the efficiency frontier) to provide it with rights, an exclusion error. In community B , however, the minority is both more numerous and has a higher density than the minority in community A . Giving rights to the minority in community A but not in community B can only be characterized as absurd.

²⁸ An important aspect is that the two national languages, Finnish and Swedish, are treated symmetrically and both formally have equal status at the national level. This can only be characterized as very generous, considering that the Swedish speakers make up 5.2% of the total population, see SUOMEN VIRALLINEN TILASTO/FINLANDS OFFICIELLA STATISTIK (2018).

<i>județ</i>	size (a)	number of inhabitants (N)	number of Hungarian speakers (n)	percent Hungarian speakers (π)	density of Hungarian speakers (δ)
Cluj-Napoca/ Kolozsvar	6 674	691 106	102 966	14.9	15.43
Sălaj/Szilágy	3 864	224 384	50 928	22.7	13.18

TABLE 3.1 Comparison of two jurisdictions in Transylvania (the size a is in km^2 and δ in individuals per km^2)

Source: Own calculations based on the 2011 census, INSTITUTUL NATIONAL DE STATISTICĂ (2011)

A politico-economic explanation for the Finnish language policy could be found in the history of the country. Finland was part of Sweden until the Vienna congress and then became a Grand Duchy in the Russian Empire until its independence in 1917. At independence, a big fraction of the *élite* of Finnish society was Swedish speaking. That is, the political influence of the Swedish speaking minority was considerable, and the members of this group were very powerful in formulating the constitution of Finland. Here then is an example of a minority being very influential and having an disproportional political influence. The preferences of the policy maker are then very favorable to the minority and very generous rules in favor of the minority are implemented.

3.2.4 An example

The city of Cluj-Napoca/Kolozsvar is the biggest city in the region *Nord-Vest* (a part of Transylvania) of Romania. This region has a considerable concentration of a Hungarian-speaking minority distributed on six administrative units (*județ*). Many of the members of this minority live in the city. Since the fraction of the Hungarian minority in it (and its associated *județ*) in the census of 2002 fell below 20%, the language rights of the minority in Cluj-Napoca/Kolozsvar were lost. In many of the surrounding areas, however, they are still in effect, for instance in Sălaj/Szilágy with an Hungarian population of about half of that in Cluj-Napoca/Kolozsvar. That is, where the minority has one of its highest numerical strength it has no rights and where it is numerically weak the members of the minority enjoy minority rights. In the region *Nord-Vest*, according to the 2011 census 31.4% of the Hungarian speakers (148 942 out of 474 134) live in areas where their language has no official status. See INSTITUTUL NATIONAL DE STATISTICĂ (2011).²⁹

In table 3.1 we are comparing the relevant parameters of the two mentioned jurisdictions

²⁹ All numbers in this example and in the one from Slovakia as well as the size of the minority in Finland are taken from census data and official statistics. The statistics in all three countries, however, is far from perfect. There is, for instance, no possibility to enter more than one language as mother tongue. The considerable number of bilingual individuals have to choose between their two languages. Dependent on the relative social status of the languages, this might lead to over- or underestimates of one or the other. In general, this is an important problem, but for our purposes here it is of no consequence.

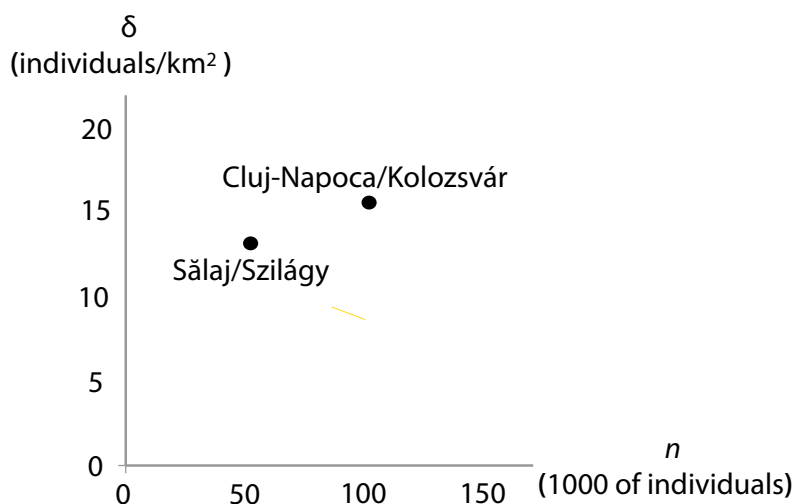


FIGURE 3.6 The characteristics of the Hungarian minority in two jurisdictions in Transylvania

and in figure 3.6 they are pictured in the $(n - \delta)$ -diagram. It is evident that if language rights are efficient in Sălaj/Szilágy they are also efficient in Cluj-Napoca/Kolozsvár, since the latter is further northeast in the diagram. Providing rights to Sălaj/Szilágy and not to Cluj-Napoca/Kolozsvár, the current Romanian policy, is clearly inefficient.

This is a very clear example of how the percentage rule can lead to absurd results. For a policy maker wanting to disadvantage a minority it is a useful and politically expedient instrument, however. Its formal neutrality disguises its real effects. The cost-efficient alternative – clearly stating the politically attributed benefits β – would be explicitly discriminating and, hence, – in most cases – politically impossible.

3.3 THE POPULATION STRUCTURE AND SIZE OF THE JURISDICTION

We have identified the relevant population structure of jurisdictions through the parameters n and δ . Each jurisdiction can be represented as a point in the $(n - \delta)$ -diagram. Due to migration or changes in the border of the jurisdiction, the location of this point might change. The efficiency frontier does not move, but the implications of the percentage rule might lead to different regions in the diagram for the implementation or rejection of the policy measure. That is, due to changes in the population structure of a jurisdiction, the location of the jurisdiction might be altered, but also the evaluation criterion, represented by different regions of the diagram, might change. We will look at both cases in this section and provide an example from Slovakia.

This is, of course, related to the issue of gerrymandering in political economy.³⁰ The general purpose of gerrymandering is to adjust the jurisdiction borders in order to benefit the incumbent government in upcoming elections. Typically, areas of a contested jurisdiction with a population unfavorable to the sitting government are moved to a jurisdiction, where the government anyhow has no chances of winning a majority, or pockets of an opposition-dominated jurisdiction with strong support for the sitting government are moved to a contested jurisdiction. This way the

³⁰ For a general overview and examples from the USA, see MCGANN, SMITH, LATNER, and KEENA (2016).

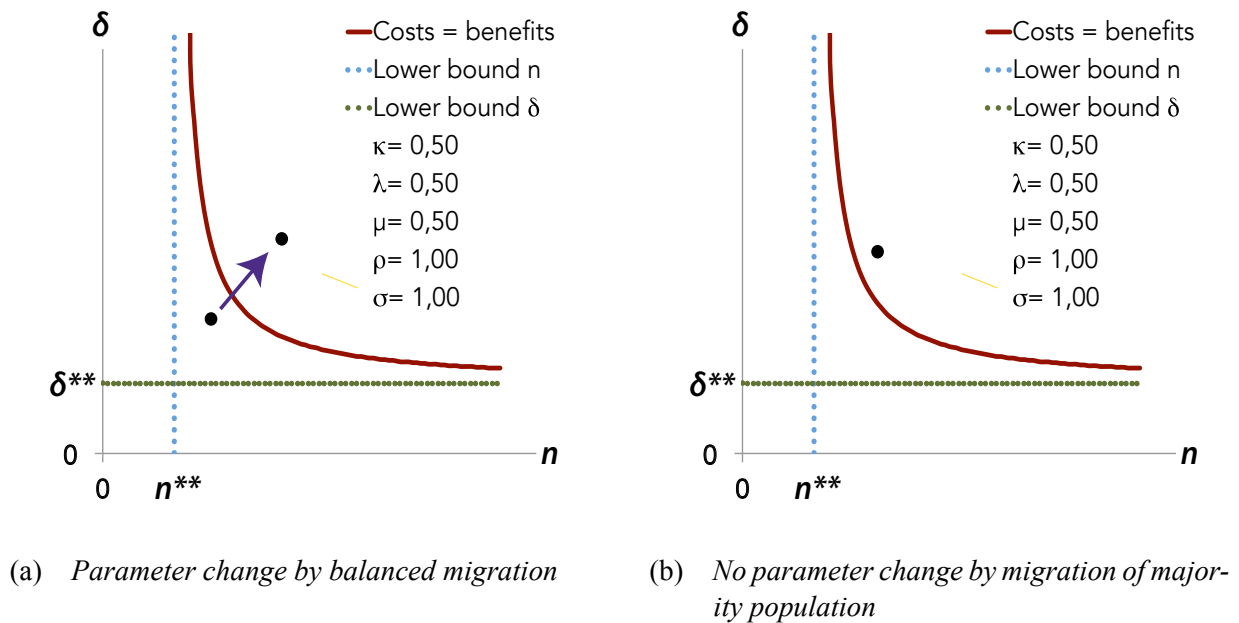


FIGURE 3.7 Effects of migration

reelection chances of the government in the contested jurisdiction are improved.

There is no principal difference between this kind of gerrymandering and changing the jurisdiction borders in order to improve or limit minority rights. Analyzing minority rights in this way, is just another example of gerrymandering.

3.3.1 Migration

We first look at migration into the area under consideration. Balanced migration with given proportions of the majority and minority population is illustrated in figure 3.7a. Here the proportions of the majority and minority of the migrant population equals the proportions in the jurisdiction before the migration. This type of migration will increase both the size and the density of the minority population, the point representing the jurisdiction in the diagram will move in the northeastern direction. At the same time, the size of the minority as a fraction of the total population will not change, so rights implied by the percentage rule will stay the same. From the efficiency point of view, some measures might become efficient that weren't before (like the measure represented in the diagram), or continuing being efficient if they were efficient before. In other words, a rule based on efficiency would be sensitive to the changed conditions, whereas the percentage rule is totally insensitive.

More common in reality, however, is an influx of only the majority population while the traditional minority population remains the same. This does not change the *relevant* population structure for the efficient decision making, since neither the number of beneficiaries, nor their density changes. However, the percentage of the minority population decreases and although we remain in the same point in the diagram, see figure 3.7b, the percentage rule will move the decision criterion to a higher critical value of δ making the implementation of policy measures less likely.

Given the percentage rule, a policy maker wanting to discriminate against a minority should

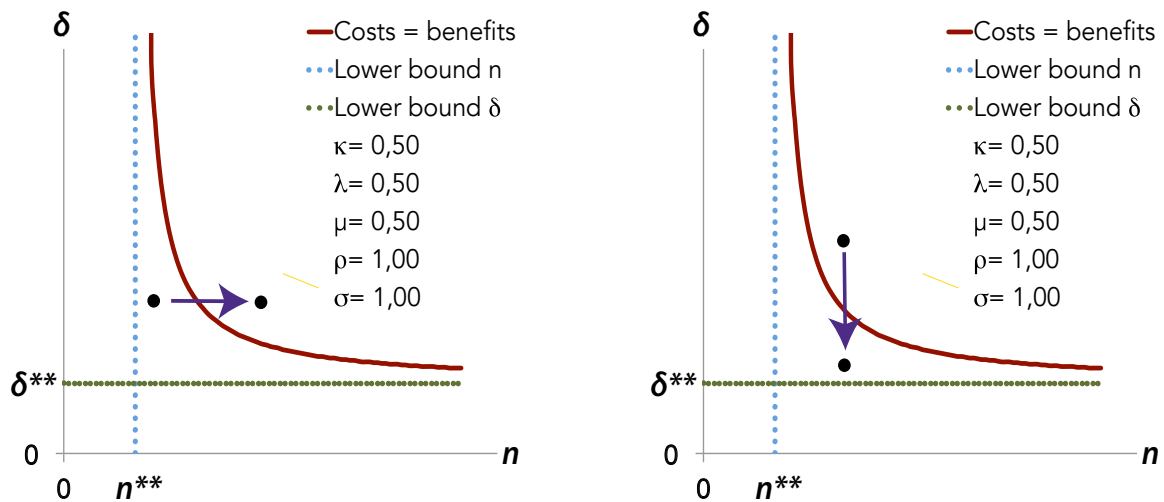
hence encourage migration of the majority population to the areas where the minority is strong. There are several examples of such policies in history. Mussolini, with the help of Hitler, tried this during the 1930's and 40's, see for instance STEININGER (2012). As a result the population majority in the city of Bolzano/Bozen in Südtirol/Alto Adige changed. Also in Transylvania through an accelerating industrialization under the regime of Ceaușescu the ethnic composition of Cluj-Napoca/Kolozsvár rapidly changed, see BRUBAKER, FEISCHMIDT, FOX, and GRANCEA (2006). It is interesting to note that with a rule depending only on δ and n such a policy would be without consequence for the language policy, and the policy makers would have less incentives to encourage this type of migration.

3.3.2 Changing the size of jurisdictions

The effect of joining two jurisdictions together or dividing a jurisdiction into two parts can be very different depending on the demographic characteristics of the jurisdictions. If the population structure in the two jurisdictions being joined is the same or if a homogeneous jurisdiction is divided, the density of the minority population does not change nor its fraction of the total population. Its size, however, is increased or decreased, respectively. Under the percentage rule, there is no change in the decision criterion, but under a rule based on efficiency, that is on δ and n only, the joining of the jurisdictions can be to the advantage of the minority, making an until now inefficient measure efficient, see figure 3.8a. Here two jurisdictions of the same demographic structure are joined. The numerical size of the minority is increased, but since the density of the minority in both jurisdictions is the same, it does not change in the new bigger jurisdiction. Also, since the fraction of the minority population is the same, it does not change either. In the $(n - \delta)$ -diagram the new jurisdiction is to the right of either of the two old smaller ones. In the situation in the picture the depicted measure, characterized by its efficiency front, which was inefficient in the smaller jurisdictions now has become efficient. The decision criterion based on the percentage rule is unaffected, however, whereas a criterion based on δ and n will reflect the new situation.

The more common case is that the minority is concentrated in one of the jurisdictions to be joined or in one area of the jurisdiction to be divided. In this case, illustrated in figure 3.8b, the number of beneficiaries remains constant, but their density decreases in the new bigger jurisdiction if two jurisdictions are joined. In addition, the fraction of the minority as part of the total population in the new jurisdiction will be lower than in the old, smaller ones. The depicted measure that was efficient (above the efficiency frontier) in the old smaller jurisdictions, is no longer efficient. That is, even with a decision criterion based on δ and n the measure should not be implemented any more; the merger of the jurisdictions disadvantages the members of the minority. Under the percentage rule the situation is even worse from the point of view of the minority population. Since the minority population as a fraction of the total population in the jurisdiction decreases, the critical value of δ necessary to fulfill the percentage criterion for implementing the measure will increase. That is, even if the measure stays efficient after the merger it might no longer fulfill the percentage-rule criterion. *In nuce*, the situation of the minority population is worsened in two ways: δ decreases and the critical value it would have to reach for the implementation of policy measures under the percentage rule increases.

Since an efficient policy measure in one of the old, small jurisdictions might not be efficient any more, (like in figure 3.8b) the joining of the two jurisdictions would not be efficient under even a perfect planning rule. Of course, dividing a heterogeneous jurisdiction can work in the



(a) *Parameter change by a uniform distribution of the minority*

(b) *Parameter change by a regional concentration of the minority*

FIGURE 3.8 Effects of merging jurisdictions

opposite direction. The example in section 3.3.3 shows this. A consequence of this discussion is that the efficient drawing of jurisdiction borders with respect to minority rights should follow the habitation patterns of the minority irrespective of how the majority population is distributed.

3.3.3 An example

Slovakia provides a good example of a country where the structure of the jurisdictions is to the disadvantage of a minority. There is a substantial Hungarian minority in Slovakia living north of the Danube, mainly in five jurisdictions (*kraje/kerület*) of which the capital Bratislava/Pozsony is one. The four *kraje/kerület* in addition to the capital with a substantial Hungarian population extend from the Danube relatively far into the center of the country.³¹ They, hence, have a population structure with a strong Hungarian presence in the south and very weak one in the north of the *kraj/kerület*. Each *kraj/kerület* is divided into a number of counties (*okresy/járás*). Looking at the population structure of the *okresy/járások* in each *kraj/kerület*, this difference between the north and the south of the *kraje/kerületek* becomes evident: In Trnavský kraj/Nagyszombati kerület, the two southernmost *okresy/járás* have a Hungarian population fraction of 78.5 and 36.1%, respectively, and none of the other five reaches even 0.5% (all numbers are taken from the 2011 census, ŠTATISTICKÝ ÚRAD SLOVENSKEJ REPUBLIKY, 2011). In Nitriansky kraj/Nyitrai kerület, the four southernmost *okresy/járás* have numbers in the range between 27 and 69% and the three northern ones 0.6, 1.1, and 6.6%. Similarly Banskobystrický kraj/Besztercebányai kerület has four southern *okresy/járás* with fractions between 23 and 43% and the other nine reach at the most 0.5%. Finally, Košický kraj/Kassai kerület has four *okresy/járás* with an Hungarian proportion between 13 and 31% and seven ones ranging from 0.1 to 4.1%.

The Slovak law gives certain language rights to some minorities, mainly regulating language use in dealing with the authorities. If the relative size of the minority reaches 15% of the

³¹ The additional three *kraje/kerület* are to the north of the country with a minimal Hungarian population.

Minority rights

<i>kraj/kerület</i>	number of <i>okresy/járások</i>	size (<i>a</i>)	number of inhabitants (<i>N</i>)	number of Hungarian speakers (<i>n</i>)	percent Hungarian speakers (π)	density of Hungarian speakers (δ)
Nitriansky/ Nyitrai	7	6 344	689 867	183 535	26.6	28.93
South	4	4 354	417 065	172 245	41.3	39.56
Noth	3	1 990	272 802	11 290	4.1	5.67
Ban- skobystrický/ Besztercebányai	13	9 454	660 563	79 830	12.1	8.44
South	4	3 876	245 712	78 314	31.9	20.21
North	9	5 578	414 851	1 516	0.4	0.27
New Southern	8	8 230	662 777	250 559	37.8	30.45
New Central	12	7 568	687 653	12 806	1.9	1.69

TABLE 3.2 Possible change in jurisdictions in southern Slovakia (the size a is in km^2 and δ in individuals per km^2)

Source: Own calculations based on the 2011 census, ŠTATISTICKÝ ÚRAD SLOVENSKEJ REPUBLIKY (2011)

total population in the area, these rights go into effect, see SLOVENSKÁ REPUBLIKA/SZLOVÁK KÖZTÁRSASÁG (2012).³² In only two *kraje/kerület* the Hungarian population reaches 15%: Trnavský kraj/Nagyszombati kerület and Nitriansky kraj/Nyitrai kerület. It is instructive to make the *Gedankenexperiment* of redrawing the borders of the *kraje/kerületek*. In table 3.2 we have rearranged two very heterogeneous *kraje/kerület* to receive two more homogeneous ones. The position of the old and new jurisdictions are displayed in the $(n - \delta)$ -space in figure 3.9. The change produces two new jurisdictions that are more even in their size and total population than the two old ones.

If it is efficient to provide rights to the minority in Nitriansky kraj/Nyitrai kerület, it certainly also would be efficient to provide these rights to the inhabitants of the new southern jurisdiction, since it is further to the northeast in the diagram. However, it is not evident that it is efficient to give rights to the minority in Banskobystrický kraj/Besztercebányai kerület, since it is located to the southwest of Nitriansky kraj/Nyitrai kerület. Even under the percentage rule, the new southern jurisdiction would be provided with rights. The redrawing of the map lets many more individuals enjoy rights for their language and it is also efficient to provide them with these rights.³³ As a matter of fact, of the 263 365 Hungarian speakers 250 559 (95.4%) would enjoy language rights as compared with the present situation with only 183 535 (69.69%).

³² Until 2012 the percentage was set at 20, but this was reduced in a amendment to the law in 2012.

³³ Specifically 78 314 of the 79 830 Hungarian speakers in Banskobystrický kraj/Besztercebányai kerület are better off and 11 290 of the 183 535 Hungarian speakers in Nitriansky kraj/Nyitrai kerület are worse off. We, hence cannot talk of a Pareto improvement, but in the cost-benefit sense it is a clear improvement.

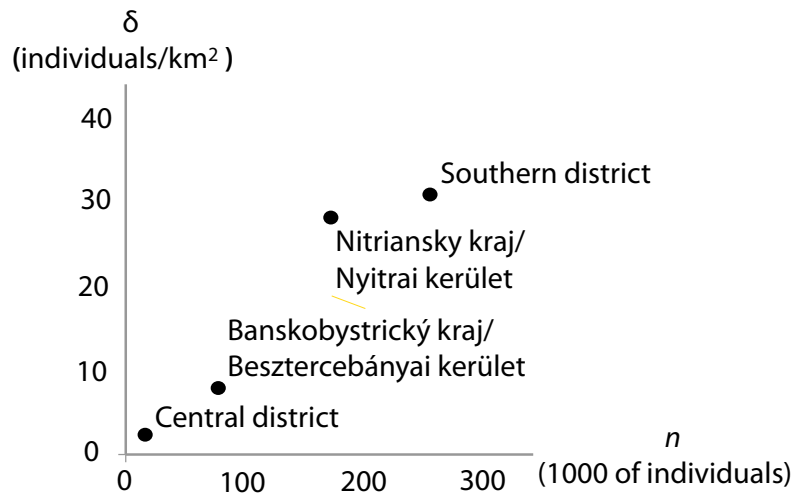


FIGURE 3.9 Reform of the jurisdictional structure in Slovakia

Hence, through the possibility of choosing jurisdiction borders, the policy maker has the power both to reduce the number of individuals enjoying minority language rights under a given rule and in addition to reduce the efficiency of the rights allocation as compared to our benchmark case. Our little example shows that this is not an esoteric theoretical point, but a phenomenon that can easily be found in the real world.

3.4 SUMMING UP

We collect the main insight from the discussion in formal statements:

PROPOSITION 3 For any planning measure, the efficiency frontier divides the jurisdictions into those where the measure is efficient and those where it is inefficient depending on the number of the beneficiaries (n) and their density (δ) in the jurisdiction,³⁴ such that if the measure is efficient in a jurisdiction, it is also efficient in all jurisdictions with the same or higher values of n and δ and, conversely, if it is inefficient in a jurisdiction, it is also inefficient in all jurisdictions with the same or lower values of the two parameters.

COROLLARY 3A A decision rule based on the fraction of beneficiaries as part of the total population – a “percentage” rule – cannot be an efficient rule.

COROLLARY 3B A migration of the majority population into jurisdictions populated by the minority does not justify any change in minority rights in

³⁴ Recall that the shape of the efficiency frontier is different for different types of goods resulting from the policy measure. For non-spatial goods it is vertical implying a critical value of n independent of δ that has to be exceeded for a measure to be efficient. For spatial measures, the frontier has a negative slope between zero and minus infinity. The steepness of the frontier is different depending on the degrees of spatiality and rivalry of the goods resulting from the policy measure.

the concerned jurisdictions, but the percentage rule leads to less rights for the minority.

COROLLARY 3C The creation of bigger jurisdictions through the merger of jurisdictions containing a minority population with jurisdictions without the minority will justify a decrease in minority rights if costs are at least partially spatial. As a result, even an optimal policy becomes less efficient.

COROLLARY 3D A federal structure with jurisdiction borders drawn according to the habitation patterns of minorities makes more efficient minority-rights allocations possible than a federal structure that is independent of those habitation patterns.

COROLLARY 3E If the minority population is concentrated to a limited number of jurisdictions, a more efficient implementations of minority rights is possible than in a situation with the minority spread over several jurisdictions.

4 CONCLUSIONS

The analysis above shows that policy makers wanting to manipulate the rights of a minority have several tools at their disposal. Fixing the politically decided benefits to society of granting different minority rights is simply a reflection of different social preferences and gives us criteria for a cost-efficient policy given those preferences. The other tools, the decision rule applied and the geographical structure of jurisdictions, influences the situation of minority populations by creating inefficiencies and inequalities in the distributions of rights.

From a constitutional point of view the latter tools are undesirable. The same discriminatory results could be achieved in a cost-efficient manner with a different decision rule and different jurisdictional borders simply by manipulating the politically determined average benefits to members of the minority of different policy measures. That this rarely occurs probably depends on the transparency of such a policy – saying in essence that one member of society has a lower value than another one is not politically *comme il faut*. The decision rule or the fixing of the administrative structure is, on the surface, “neutral” and treats everyone formally equally. It requires some analysis, though, to show that the results can be very damaging to some individuals. The political system at times is very expedient at letting a majority cause harm to a minority (or letting an influential minority create privileges for its own members) simply by taking advantage of indirect effects on differing individuals of the design of formally neutral policies.

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APPENDIX

A PROOF OF PROPOSITION 1

We have to distinguish two cases and, in the first one, four subcases:

1. Perfectly non-spatial case ($\frac{\partial c}{\partial a} = 0$): In this case the costs are a concave function of n only.
 - (a) If $\lim_{n \rightarrow 0+} \frac{c(n)}{n} > \beta > \lim_{n \rightarrow \infty} \frac{c(n)}{n}$, expression 2.2 will give us a finite critical value $n^* > 0$, such that the measure is efficient for n above n^* and inefficient below. That is, the efficiency frontier consists of a fixed value of n , a vertical line in the $(n - \delta)$ -diagram.
 - (b) If $\beta \geq \lim_{n \rightarrow 0+} \frac{c(n)}{n} \geq \lim_{n \rightarrow \infty} \frac{c(n)}{n}$, the measure is efficient for any size of the minority population, and the vertical efficiency frontier is at $n^* = 0$.
 - (c) If $\lim_{n \rightarrow 0+} \frac{c(n)}{n} \geq \lim_{n \rightarrow \infty} \frac{c(n)}{n} > \beta$, the measure is never efficient for any size of the minority population, and there is no efficiency frontier.
 - (d) If $\lim_{n \rightarrow 0+} \frac{c(n)}{n} > \lim_{n \rightarrow \infty} \frac{c(n)}{n} \geq \beta$, the measure is never efficient for any finite size of the minority population, and there is no efficiency frontier.³⁵
2. All other cases ($\frac{\partial c}{\partial a} > 0$): Define the efficiency frontier $\delta^e(n)$ implicitly by the identity:

$$\beta n \equiv c\left(n, \frac{n}{\delta^e(n)}\right) \quad (\text{A.1})$$

and take the derivative with respect to n :

$$\beta = \frac{\partial c}{\partial n} + \frac{\partial c}{\partial a} \left(\frac{1}{\delta} - \frac{n}{\delta^2} \frac{\partial \delta^e}{\partial n} \right) \quad (\text{A.2})$$

Rearrange:

$$\beta n = \frac{\partial c}{\partial n} n + \frac{\partial c}{\partial a} a - \frac{\partial c}{\partial a} a^2 \frac{\partial \delta^e}{\partial n} \quad (\text{A.3})$$

and substitute A.1 into this expression:

$$c(n, a) - \frac{\partial c}{\partial n} n - \frac{\partial c}{\partial a} a = -\frac{\partial c}{\partial a} a^2 \frac{\partial \delta^e}{\partial n} \quad (\text{A.4})$$

The left-hand side of expression A.4 is non-negative because of the concavity of $c(n, a)$ and $\frac{\partial c}{\partial a}$ is positive *ex hypothesi*. Hence, $\frac{\partial \delta^e}{\partial n} \leq 0$ ■

³⁵ The case $\lim_{n \rightarrow 0+} \frac{c(n)}{n} > \lim_{n \rightarrow \infty} \frac{c(n)}{n} = \beta$ would imply an infinite n^* because of the concavity of c .