



Costs and benefits of language policy: how to measure them

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Costs and benefits of language policy: how to measure them*

by

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1. Introduction

The topic of this chapter is how to measure the costs and benefits of language policies using applied economic analysis. This is of interest since little has been done in this area, yet language policy is one public policy amongst others and thus in competition with others for both public funding and for the deployment of public regulatory powers mobilizing private spending to attain public policy goals (see also Wickström and Gazzola in this handbook). Thus, language policy advocates and makers can gain from engaging central decision makers using an economic approach. A correct assessment of the benefits and costs of language policies is central both in the programming or design phase and in the evaluation phase. The chapter presents the most important techniques and methods to assess the benefits and the costs of language policy, and it provides five practical examples of application, that is, language acquisition policy aimed at providing schooling in maternal language of a minority group¹; language acquisition policy aimed at teaching a second language; public provision of services in minority language; state regulated private provision of services in a given language; and public provision of signage.

2. Key issues,

The key general issues in public policy analysis are: (i) the choice of the method of analysis, (ii) the choice of a time period, and (iii) the choice of a geographic area. In the case of language policies, one must also examine (iv) existence value, and (v) endangerment. Let us examine these five issues in turn.

(i) Analysis of public policy can be done using one of three tools: impact, cost effectiveness or cost-benefit-analysis:

- a) Impact analysis examines if a policy has an impact measurable in changes of a specific metric such as the number of viewers of a TV program or web videos in a specific language.
- b) Cost effectiveness analysis examines the average cost of obtaining a unit of given impact. Thus, one has to spend a certain amount of money ($X\$$) to attain an audience of Y viewers of a TV program or web video in a specific language.
- c) Cost-benefit analysis uses the same costs but transforms the outcome into \$, thus reaching Y viewers is worth $Z\$$ for the policy maker.

While impact analysis and cost effectiveness analysis are useful tools, they do not permit comparisons between various policies such as vaccination, road safety and minority language support since their outcomes are measured differently. Only cost-benefit analysis allows such comparisons; this makes it the preferred policy analysis tool of economists.

(ii) One must select the geographic area examined. If the costs are incurred by government W , national or sub national, does one limit the impact analysis to the residents of country/region/city W or does one include the spillovers in other countries/regions/cities? Web broadcasts can be consumed anywhere in the world. Thus, a broadcast in language A in W where A is a minority language may be consumed by speakers of A in other countries. The decision to include geographic spillovers (also referred to as externalities, see Wickström and Gazzola in this handbook) in the analysis will modify the benefits but not the costs of the policy.

(iii) One must also specify the time period accounted for. Some policies have an immediate impact while others have a longer lasting one. Thus, weather warnings have a short life, road signs have a longer life and the acquisition of a language yields a lifetime asset. Hence, the time period examined should vary between policies. If it is longer than one year then the issue of discounting arises. Should future benefits of the same monetary value as present benefits be accounted for with a reduced value (discounted using a rate of discount/ interest) or not. Discounting means that future benefits are worth less to today's decision makers/society than current benefits. This is an ethical choice for some but for most economists the fact that the real (net of inflation) interest rate is usually positive implies that discounting should be used.

(iv) Some languages or language minorities are according to sociolinguists threatened with extinction; Mufwene (2016) raises the question as to why all should be preserved. One may need to carry out a contingent valuation (Carson, 2012) which is a technique to estimate the value of commodities or services when the price mechanism does not work. For some of these languages there may be no market value (which means that knowing them does not increase earnings or reduce prices paid for goods and services) but society may want to preserve them in the same way it preserves scenery in remote areas.

(v) For some languages the decline is most likely irreversible, for others it is reversible but at a very high unit cost per speaker/hour of use, and for some the decline is reversible at a reasonable² cost per speaker. Since public funds are limited how should public policy allocate funds among these languages³? Should this be equal per capita spending for existing or potential speakers? Alternatively, should more per capita be allocated for languages above a given threshold of survivability often linked to absolute size? Perhaps, more should be dispensed for languages not found elsewhere in the world (scarcity premium)? One possible answer is to use the method referred to as Priority Threat Management to allocate funds (Martin et al, 2018).

3 Development of literature

Economists began examining language issues and language policies in the mid-1960s with papers on language policies mainly inspired by debates in Canada and Québec on language laws; Gazzola et al (2016) and Grin (2016) review this literature extensively. The first papers examining the costs and benefits of language policies are simple calculations with hypothetical numbers for the economy as a whole. One of the first real world studies is by Vaillancourt (1978) drawing on the studies produced when Bill 101, Québec's language policy, was debated and adopted in 1977. A more systematic and comparative analysis is found in Grin and Vaillancourt (1999) where the cost-

effectiveness approach is used. More recent work by Coche and Vaillancourt (2009) Vaillancourt *et al* (2012) and Leblanc- Desgagné and Vaillancourt (2016) uses a basic cost-benefit approach. Finally, Wickström (2019) presents a theoretical analysis that illuminates the existing empirical work.

Cost-benefit analysis is an application of welfare analysis. Such an approach is grounded in the work of Jules Dupuit in the 1840s and Alfred Marshall in the 1880s-90s. It came into explicit⁴ use following the 1936 adoption by the American congress of the Floods Control Act that stipulates that work could be carried out *if the benefits to whomsoever they may accrue are in excess of the estimated costs*. This led the Army Corps of Engineers to develop the cost-benefit analysis with economists adding theoretical underpinnings starting in the 1950s. The work by Vaillancourt with various co-authors on assessing language policies also draws on analytical accounting as applied to the analysis of the administrative and compliance costs of taxation where the seminal contribution is by Cedric Sandford (1973). The interested reader can find a review of the recent literature in Eichfelder and Vaillancourt (2014).

4 Theories and methods

The general theoretical framework as noted above is that of cost-benefit analysis applied to regulatory analysis. The micro-economic underpinnings are those of mainstream economics where markets yield information on relevant prices. To apply this framework, one must carry out the following three steps.

- i. Find data on the benefits in specific monetary units (e.g. \$). One needs to quantify the benefits of a policy as some measurable outcome. This can be for example more speakers of A, more use of A, better outcomes for A speakers or greater self-esteem of A speakers. Then one applies a price (value) per unit to obtain a monetary outcome. One must measure the impact of the specific policy and not of other changes occurring at the same time. Carr-Hill et al (2016) present statistical tools that can be used to evaluate policy outcomes. Such tools in general also discussed in Di Paolo in this handbook⁵. The key point when implementing a new policy is to ensure that the information necessary to evaluate it is collected during the implementation phase rather than attempting to do this as an afterthought.
- ii. Find data on the full costs in \$. Costs should include both money and time costs expressed in \$, both directly and indirectly linked to the policy examined. Full cost of labour is the sum of gross wages (wages before deductions for personal income taxes, payroll taxes and so on), fringe benefits paid for by the employer, and relevant overheads that include the costs of office space, computing services, central administration (human resources) and so on.
- iii. Present the distribution of benefits and costs for relevant groups. This is incidence analysis (discussed below); it tells us who receives the benefits of a policy and who pays. Of particular relevance may be the distribution between the taxpayers of national and sub-national governments if language groups live in specific regions of a given country where language policy is more or less decentralized (Grin and Vaillancourt, 2002).

To calculate these various items one can use the three specific tools presented below, that is, the unit cost difference tool, the internal rate of return/present value tool, and the incidence analysis tool.

4.1 The unit cost difference tool

This uses the cost of a policy targeting the minority language group calculated with respect to the cost of the same policy targeting the majority language group and not with respect to the no policy/no cost benchmark. This is calculated if there are constant returns to scale (see below for definition) by:

- i. calculating the unit cost difference (UCD) between the beneficiary of, on one hand the majority language policy delivery mechanisms and, on the other, the minority language stream;
- ii. multiplying the UCD by the number of beneficiaries of the minority language stream.

Returns to scale are an economic concept linking costs and size of output; they are measured as constant, increasing or decreasing. These three outcomes are measured by examining what happens if the size of output changes. Thus, assume that it costs 10\$ per unit when one produces 100 units in a day for total cost of 1000\$. What happens if the output is doubled in a day to 200? One can find:

- Constant return to scale: the total cost doubles to 2000\$ but the unit cost remains unchanged at 10\$. Constant returns to scale are often associated with the production of individualised services;
- Increasing returns to scale (economies of scale): the total cost increases to 1800\$ and the unit cost drops to 9\$. Increasing returns to scale are often observed when a fixed capital input is required;
- Decreasing returns to scale (diseconomies of scale): the total cost increases to 2200\$ and the unit cost to 11\$. Decreasing return to scale often result from congestion.

Economies of scales can be measured over time as output and costs change for a given producer or from comparing at a point in time institutions of various sizes providing the same output (figure 1 below).

4.2 The internal rate of return/present value tool

This tool can be used to compare two policies, A and B and to choose which one to implement. By assumption, B yields a higher stream of benefits than A, and B is also costlier. Then one can compute either the present value for a given discount rate or the internal rate of return (the rate of interest yielding a present value of zero) of implementing the costlier policy using the following formula

$$\text{Present value} = \frac{\sum_{i=1}^n (\text{benefits policy B} - \text{benefits policy A})}{(1 + r)^i} - \text{costs of B}$$

- i. \sum is the sum over the relevant number of years⁶ of the difference between the two streams of earnings

- ii. r is the discount rate and $(1+r)^i$ the formula used to discount future benefits such as higher earnings that can be gained from more education, a second language or other enhancement to human capital
- iii. cost is the cost of the costlier policy (B) that is the excess cost of policy B over policy A where A may cost zero

4.3 The incidence analysis tool

Incidence analysis is the tool that provides information on the distribution of the benefits and costs of a public policy within a given population. This is usually done using three steps. In the first place, identifying the analytical unit: individual, family or household? Individuals are usually not an appropriate choice since children are part of families and draw benefits from public policies while not paying for them. Families and households are broadly similar. Second, calculating the burden of taxation (cost of public services) paid by household: one must attribute the overall amount of various tax and non-tax revenues to households. This in some cases can be done fairly easily; information on personal income taxes or payroll taxes paid is often found in family/household data bases. For the value added tax (VAT) and other consumption taxes, one can often use consumption information in the same data bases. For other taxes such as the corporate profits tax, one needs to make assumptions as to what economic factor bears the burden: capital income, consumption or labour income. Finally, calculating the amount of public services consumed by household: One must attribute the overall value of various public services to households. This in some cases is fairly easy to do: the value of primary schooling is linked to the age structure of the household for example. In other cases, one can use private spending patterns: households who fly will derive more benefits from air control services than those who do not. Finally, in some cases, one must make an informed choice. For example, is national defence equally valuable for each household or is its valuation linked to family/household income?

For our type of analysis, a final step is to assign a linguistic component to each public service. Public broadcasting has a higher language component than debt repayment for example.

The next part of the paper presents five examples to illustrate how to evaluate language policies, distinguishing between language acquisition and language use policies.

5. Applications to language acquisition and language use policies

Language acquisition policies usually target children (0-18) through pre-school (daycare, kindergarten...) or primary / secondary schools with the intent of ensuring their knowledge of at least one language. They can be implemented in the context of ensuring the survival of a minority language or the learning of a national / regional language by immigrants. Language use policies target society as a whole but in practice may focus on groups such as workers (language of work), consumers (language of shops) and so on. We first examine two language acquisition policies.

5.1 Language acquisition policies: schooling in maternal language of a minority group-

This examines the case of a government that provides universal free primary / secondary schooling. It has within its borders both a majority and one minority language group, both clearly identifiable with similar socio-economic status. As discussed in section 6 below, this tool can be generalized to other contexts.

Costs for the public sector

Table 1 provides an example of how to carry out such an analysis using data from Alberta for 2016. This Canadian province is chosen as it has very complete data on majority and minority language education costs. Lines 1 and 2 (columns i-v) present the costs for four major functions as well as the total cost of the majority and minority language school networks. Column vi) presents the number of students. Line 5 shows that, per student, each educational input is costlier in the French than in the English school system, with transportation (bussing) almost thrice as expensive.

The UCD for a francophone minority student is 4 340 \$ (16 210 minus 11 870), that is the difference between the per student cost in the French-medium schools and the per student costs in the public English school system. Multiplying this by the number of francophone students yields a (rounded) cost differential of 35 300 000\$. This is the supplementary yearly cost of educating the francophone minority not the 132 000 000\$ reported in Table 1 (column v, line 2). These calculations assume (i) a reasonable degree of similarity of both groups in non-language education related characteristics such as special education needs; and (ii) a marginal cost equal to the average that is constant returns to scale; adding one student to the Public English school system will cost 11 870\$. These appears to be reasonable assumptions; in particular an increase of only 1.7% of the size of the public English school network that resulted from all francophones using it should not significantly change average or marginal costs.

Type of school boards	Instruction i)	Operations & Maintenance ii)	Transportation iii)	Administration iv)	Total v)	# of students vi)
	Total Cost (000)\$					--
Public –English 1)	4 328 000	753 000	276 000	185 000	5 618 000	473 170
Public-French 2)	91 000	19 000	14 000	6 000	132 000	8 140
	Per student cost \$					--
Public –English 3)	9 147	1 591	583	391	11 870	na
Public-French 4)	11 175	2 333	1 719	737	16 210	na
Ratio French/English unit costs 5)	1,22	1,47	2,95	1,88	1,37	na

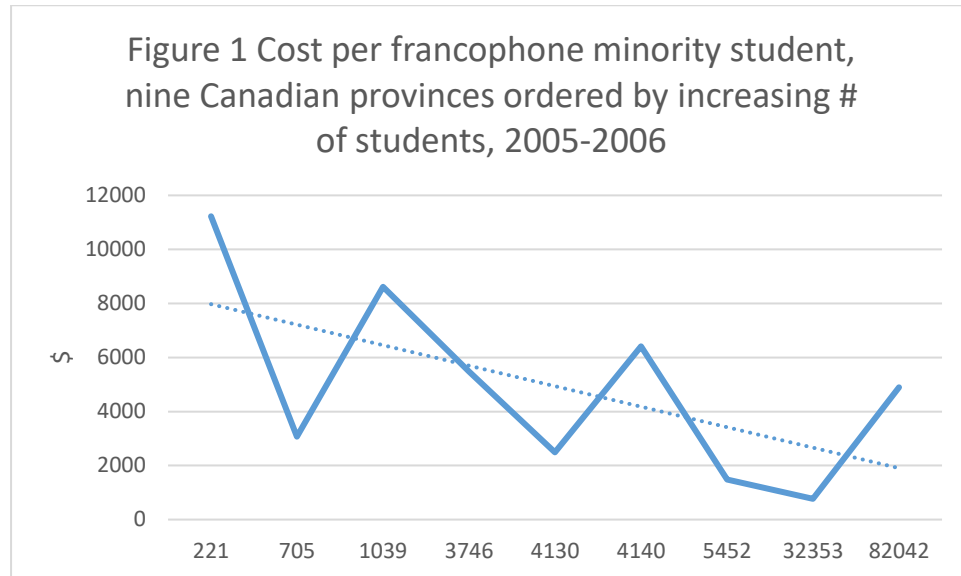
Note: numbers are rounded; miscellaneous costs are not reported. na: not applicable. K-12= Kindergarden to Grade 12 thus 13 years of normal schooling. Public schools account for about 70% of students and spending on education in Alberta in 2016-2017

Source: calculations by author using data (gathered 21/02/2019) from:

<https://education.alberta.ca/media/3739837/2016-2017-report-of-expenses-by-program.pdf> for costs;

<https://education.alberta.ca/alberta-education/student-population/> for number of students

Assuming constant returns to scale is not always correct. Figure 1 shows decreasing unit costs as the absolute number of students of nine French language minorities in Canada increases from one province to another.



Source : Vaillancourt et al 2012 Figure 12.1, p111

Costs for the private sector / households

The only cost is the extra transportation time incurred by children compared to going to an English language school that would be closer to their home.

Benefits

The main benefits of offering minority language education at least in Canada⁷ is that it should reduce the degree of language shift from that language to the majority one. A secondary benefit may be an increase in the number of bilingual individuals that may draw some financial reward from this skill. The reduced language shift may be valued using a contingent value analysis. Such a methodology links an outcome to how much it is worth to a respondent and thus how much they should be willing to pay to attain that outcome. This is done using survey data since there is not an actual payment and can thus be subject to an overestimation of this amount. In this case, this would ascertain how much a taxpayer is willing to pay in \$ to increase the odds of survival of a language minority by say 10%. For Albertans as a whole it costs about 1\$ per person to educate 1000 francophone minority student in French in 2016.⁸ Thus a willingness to pay 10\$

per year would be enough to increase the odds of survival of that minority although the exact percentage increase is not known⁹.

2.2 Language acquisition policies: teaching a second language

Cost for the public sector

In order to understand the impact of language policy on costs in this case we must first clarify whether the institution teaching this language is given a set number of daily teaching hours or is it expanding the number of hours by, say, 30 minutes a day? If the number of hours is given, then supplementary cost may result from two sources, that is, 1) having to pay teachers of a given language more than the teachers of the displaced subject matter or 2) having to pay more for the relevant pedagogical material than what was paid for another topic. One possibility is to teach this language through immersion. This is often done in separate teaching facilities using pre-existing buildings. But this could result in immersion in some cases as raised in Hélot and Bonacina-Pugh (this volume).

Cost for the private sector / households

There are two private costs that may result from this policy. One is a lower knowledge of a subject such as geography or mathematics than would have been attained if language teaching time had not been increased. This is not the case if immersion is used to teach such subjects or if the teaching of such subjects is done in this second language, assuming equal quality of instruction something that may not hold Hélot and Bonacina-Pugh (this volume). The second cost is that using existing facilities to offer immersion programs may require some students to incur higher transportation cost to both immersion and non-immersion schools.

Benefits

In the case of countries with two official languages, teaching the second language may help foster national unity and facilitate the provision of various public services. It may also provide private returns to individuals if bilingualism is rewarded. How would one ascertain if such private returns exist?

First, one would need to establish the supplementary (\$) cost of teaching a second language. Let us assume that it is 25 000\$ over the primary /secondary schooling period (age 6-18 or 12 years).

Second, one would need to estimate the earnings associated with knowing a second language. This is done by estimating earnings equations for both bilinguals and unilinguals with otherwise similar characteristics (see Grenier and Zhang this volume, and Grin and Vaillancourt 2015). This presumes that children can attend schools where one or two languages are taught. Thus, the impact of less (or not) teaching time for a non-language subject is reflected in these earnings profiles assuming equal total teaching time in both types of schools. One then uses these equations to calculate the relevant earnings profiles. We will use a stylised set of such profiles that assumes a 10% earnings premium for bilingualism, roughly the case of Québec (Vaillancourt, 2018) and a 45-year work life.

Third assume that the bilingualism rewarded is solely explained by the teaching of the second language in primary and secondary school.

Then one can compute either the present value for a given discount rate or the internal rate of return (the rate of interest yielding a present value of zero) of this spending. In our simulation, total earnings of non-bilinguals over their work life are 1 385 000\$ while for bilinguals this amount is 1 523 000\$ and the difference is 138 000\$. Using Excel one can compute an internal rate of return (IRR function) of 9% and a present value (PV function) of 46 000\$ with a discount rate set at 5%.¹⁰ The IRR is the return measured in percentage points, similar to the interest rate on a bank deposit on the investment of 25 000\$ in bilingualism while the 46 000\$ PV tells us that the payoff (increased earnings) of investing in a second language measured in \$ for a given interest rate (5% here) is 71 000\$; subtracting the costs of 25 000\$ yields the figure of 46 000\$. If bilingualism required additional inputs (summer camps, private lessons...), then their cost should be added to the 25 000\$ cost reducing the IRR or PV. If bilingualism yields non-monetary benefits such as cultural or health (delaying/attenuating dementia for example) ones, their monetary value should be added to the earnings of bilinguals, increasing the IRR or PV.

We now turn to three language use policies. They will either require that a given language be used or at least be offered for use in the performance of a given activity by a public or private body. This can require language use in public or private signage, language use in commercial transactions, right to use language in the workplace or when interacting with public administrations (government offices or tribunals for example).

5.3 Language use: public provision of services in minority language

This examines the provision of non-capital / recurrent services in a minority language; these are services such as telecommunication or in person interactions, forms and guidebooks, radio/TV/web programs and so on.

Costs for the public sector

One can establish the cost of these services through three approaches.

Budgetary information. For some countries one will find in public documents specific information on the cost of providing services in a minority language. For example, for Canada one finds information on the budget of the Commissioner of Official Languages of 21 million (CAD\$) for 2018-2019¹¹ in the detailed federal government expenditure budget (called in Canada Main estimates).

Unit cost difference. This second approach can be used here but contrary to the minority schooling case, one must first define who is being served. Again, using Canada as an example¹² let us examine public broadcasting breaking down the discussion into five steps.

- 1) The public federal Canadian Broadcasting Corporation (CBC) broadcasting in English and Société Radio Canada (SRC) broadcasting in French have respectively budgets of 982 and 748 million Canadian \$ for 2018 as well as 101 million of shared costs (mainly transmission and finance)¹³.

- 2) Thus, SRC accounts for 43% and CBC for 57% of the total identifiable public broadcasting budgeting; allocating the 101 million according to these % yields total costs of broadcasting in French of 791 million and in English of 1 040 million.
- 3) There are three possible definition of the population targeted by these two services. Francophones can be defined using mother tongue (MT): 7 166 000 (20.6% of the total population of 34 767 000); the language spoken at home: 6 944 000 (20, 0%); or the sole official language known (OL): 4 145 000 (11, 9%)¹⁴. The remainder of the population is defined as anglophones (with a population share of 79, 4%; 80, 0%; 88, 1% depending on the definition used) for the sake of simplicity; OL data shows that 1.9% of the population of Canada does not speak English or French.
- 4) The unit cost per potential listener/viewer of the CBC is 37.70\$ and that of the SRC 110, 4\$ using MT, yielding a UCD of 72. 70\$; these costs become 34.00\$ and 189.90\$ using OL with a UCD of 155.90\$.
- 5) The estimates of cost differential are $72.70 \$ \times 7\ 166\ 000 = 521\ \text{million}\ \$$ using MT and $155.90 \$ \times 4\ 145\ 000 = 646\ \text{million}\ \$$ using OL, both lower than the attributed budget (748 million \$) or total cost (791 million \$) of SRC.

The key point to note is the impact of the definition of the clientele. Using a *need to use* (OL) rather than a *can use* (MT) definition changes the cost calculations. Thus, what is the purpose of the policy; to promote French or to ensure minimum access to French services? Both estimates assume no economies of scale. Insofar as CBC covers Canada outside Québec quite well, the marginal cost of serving non-Québec francophones is probably quite low and thus offering only CBC services would yield some economies of scale.

Using public information or calculating cost differentials are approaches that can be labelled bottom up calculations where one adds up specific identifiable costs of providing minority language services. If this is not feasible then one can use a top down approach to tease out imbedded costs that cannot be identified or calculated precisely. In this case, one starts with all government spending then removes items that in the judgment of the analyst are not linked to the policy under study. For example, payment of the public debt or transfers to other levels of government have little language content. Then one provides estimates of embedded language costs for the remaining government costs. Coche and Vaillancourt (2009 table 5, p. 30) present an example of this type of analysis.

Cost for the private sector / household

There may be private costs of using minority language public services if the supply is restricted: one may have to wait longer to interact with border agents who speak the minority language or one may have a smaller choice of guided tours of historic sites in that language.

Benefits

The benefits from services in minority languages is the possibility for minority members to use their own language rather than the majority language. This is more or

less valuable for various types of publicly provided services and for various degrees of knowledge of the majority language by minority members. Receiving health services or tax advice in the minority language is most likely more valuable for a minority member than a nature tour by a park ranger.

One can again use contingent valuation to establish the value of these services; if not feasible, one can estimate what the cost of obtaining these services in an official unilingual environment would be as Coche and Vaillancourt (2009) do. This can be seen as a minimum value approach. The three costs estimates result from:

- an informal supply of services in the minority language by civil servants who speak it. They would help minority language tax filers, applicants for passports and so on fill out the various forms. This would take them away from their other duties and impose a cost on the government if service standards are maintained since more time and thus more employees would be required mainly in offices interacting with minority language speakers (regional differences for example);
- a supply of translation /interpretation informal services between the minority and the majority language by bilingual family members or friends of unilingual minority individuals. This would require expenditures in time by these friends/ family members, be they minority or majority members;
- a supply of translation/interpretation formal services by professional interpreters/translators. This would require expenditures in money by unilingual minority members.

The required total supply of translation/interpretation hours depends on the number of minority members and the amount of time minority members interact with the government in person or through forms or websites. The value of this supply in \$ depends on the value of the time of each provider: average wage of civil servants, average wage of the population (random distribution of friends and family) and average hourly cost of translators / interpreters. Coche and Vaillancourt (2009) use the average of these three costs in their calculations since there is no evidence on what approach would be used in what proportion.

In a similar vein, Gazzola (2017) examines the consequences of the World Intellectual Property Organisation (WIPO) granting in 2008 the status of a language of publication of the Patent Cooperation Treaty (PCT) to Korean. Using a simulation of translation costs, he concludes that this led to a reduction in the costs of access to the PCT procedures for Korean-speaking applicants of about 54%.

It is sometimes argued that the value of the services generated by the language industry, that is the cluster of translation or interpretation services created to supply minority language services, is a benefit of a language policy requiring more than one language. This is false; it is a cost of such a policy that generates benefits such as the availability of services in a given language. It may create businesses that can export such services but the benefit then results from these exports.

5.4 Language use-regulated private provision of services in a given language

Language laws may require that a specific language be used in private activities such as the labelling of products, the signage of the workplace, commercial signs, the language of internal and external documents and so on.

Costs for the public sector

These are the costs incurred by the supervisory bodies responsible for the implementation of this policy. These are usually found in public documents as discussed above.

Cost for the private sector / households

These costs are incurred by businesses. They can be ascertained using surveys asking question about these regulatory costs. One must be careful to:

- a) Distinguish between implementation and ongoing/recurring costs¹⁵. Implementation costs of a new policy tend to be higher than recurring costs.
- b) Specify the time period to be reported on. It is often easier to use a time period used by the business for another purpose such as annual budgeting.
- c) Specify the geographic area targeted if relevant;
- d) Emphasize that reported costs must be generated by the legal/ regulatory requirements. Costs incurred by choice to, for example, submit bids in a specific language or to attract customers who prefer that language are not the result of such requirements.

Benefits

The main beneficiaries of these regulatory policies are the speakers of the languages thus promoted. In a given society, this may well hurt the status of other groups. For example, Québec's language policies reduced the value of knowing only English in Québec and increased the value of knowing only French (Vaillancourt, 2018, 2019). It is possible to formally calculate the incidence of language policies by households, but this requires robust data and hypotheses. The only such calculation up to now appears to be by Leblanc- Desgagné and Vaillancourt (2016). They calculate for OL francophones households an average value of federal government services with a significant language dimension of 930\$ and a tax contribution of 125\$ for a net subsidy of 805\$; anglophone households pay 130\$ without any public services benefits. They also compute who pays for services in French by income decile and find that higher income francophone households pay a greater share of the cost of receiving services in French.

Some public policies may strengthen the capacity of businesses to serve foreign markets in a specific market; thus, Québec businesses may more easily export to French Africa than American firms given the availability of French speaking managers and engineers. But it may well be that the private sector has this ability without a policy promoting a language.

5.5 Language use-capital good: public provision of signage

One policy sometimes pursued in regions (such as Wales or Friuli) where a minority language group resides is the provision of bilingual signs such as road signs.

Costs for the public sector

The key issue is to account for the durability of these signs. Thus, if roads signs have a useful life of ten years before they must be replaced and if their initial cost is 1000\$ then their yearly cost is 100\$ (in real terms) when comparing them to other policies on an annual basis

Cost for the private sector / household

None.

Benefits

These signs are of little direct benefits to non-speakers of the minority language since they cannot read the minority language. And they are of little direct benefits to the minority residents since they most likely know where they are. Contingent valuation needs to be carried out to ascertain their symbolic value.

6 Challenges, debates and perspectives

Evaluating the benefits and costs of language policies is important if language policy makers want to fully participate in the decision-making process of governments. This chapter will hopefully help the reader either carry out or understand the outputs of such evaluations since it presents some of the main tools that economists use to evaluate public policies, and applies them to various language acquisition and language use policies. There are three main challenges faced by these policy makers. First, convince both government officials and minority members that economic analysis can be meaningfully used to both guide and assess language policies. Second, ensure that both government management information (budgets, performance indicators...) and general statistical data contain useful language related information; this can require modifying internal processes to ascertain the language used when interacting with residents or the content of survey/census questionnaire. Third, produce quality policy analysis so that language policies are treated similarly to other policies when policy decisions are made.

While the paper draws mainly on the case of Canada where there are two official languages and thus clearly a minority and a majority, the tools it presents can be used to assess language policies in a multi-minority context, for aboriginal languages and when ex-colonial languages are present. Thus they can be used in the case of Spain (with Basque, Catalan and Galician minorities) of Brazil or Canada with numerous small aboriginal communities or of numerous African countries where English, French or Portuguese, the language of their past master, is used in various functions. In all cases, one must define the policy to be examined, such as switching from one language to another in providing primary education or in offering public documents, establish its costs and compare them to its benefits.

Further readings

Grin and Vaillancourt (1999) is an example of cost effectiveness analysis of language policies applied to three European countries. The framework used outlines inter-relations between various feedback mechanisms.

Gazzola, (2016) is an interesting analysis of European language policies and in particular of the distributional impact through the disenfranchisement index.

Grin (2016a) and Gazzola, M., Grin, F. & Wickström, B.-A. (2016) combined together provide a thorough survey of the economics of language literature as of 2015:

Wickstrom (2019) for an interesting theoretical treatment of these issues.

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¹ That is a smaller group in numerical terms; in this case francophone minorities in English speaking provinces in Canada. One could apply the analysis to majority groups that see their language not used for schooling.

² Reasonable as in similar to the cost of teaching a minority language in school for example.

³ In my experience, some linguists find this repugnant and refuse to provide answers. This is their choice but then they leave it to other policy makers with no or less language expertise than them to make the choice. An analyst in the central budget department/Treasury Board will in the end make the choice.

⁴ It was used before that but in a somewhat more ad hoc fashion

<https://community.amstat.org/zthechicagochapterold/calendar/pastevents/20052006/may52006conference/downloadpresentationshistoryofcostbenefitanalysis> consulted May 20th 2020

⁵ References in this chapter to other chapters of this Handbook are the result of requests by its editors as this author has not seen these chapters and thus is incapable of assessing their relevance.

⁶ For capital goods one would use how long the assets is useful using information provided by engineers such as a bridge built for 75 years a school for 50 years . For a language policy one can use the length of life of individuals (life expectancy) o the length of a specific part of life ;thus language of work rewards occur during the work phase of life say 45 out of 80 years for example.

⁷ Benefits will differ from one linguistic environment to another; it may well be for example that a good knowledge of a regional Ethiopian language facilitates learning English which in turn facilitates accessing university education in that country.

⁸ $4340 \times 1000 = 4340\ 000\$$ while the population is 4210 000 so the average cost is 1.03\$. Population figures are derived from <https://open.alberta.ca/dataset/aa3bce64-c5e6-4451-a4ac-cb2c58cb9d6b/resource/a71df6d9-4a40-446f-b209-e7e1feb22a21/download/2018-q3-population-report.pdf> consulted 22/02/2019

⁹ The phrasing of the question has to be carefully decided. For example asking “what is something worth to you” is different from asking “how much would you pay”. If possible one should use a split sample and use the average of answers to the two questions as the contingent valuation.

¹⁰ One has a choice of before (gross) or after (net) personal income and payroll tax earnings profiles. Here since we examine the cost of publicly provided language teaching we must use gross earnings.

¹¹ I-13 <https://www.canada.ca/content/dam/tbs-sct/documents/planned-government-spending/main-estimates/2018-19/me-bpd-eng.pdf>

¹² Because it is data rich, well known to the author and already studied

¹³ Annual report 2017-2018 P40 <http://www.cbc.radio-canada.ca/site/annual-reports/2017-2018/documents/2017-2018-annual-report-cbc-radio-canada.pdf>

¹⁴ Total and mother tongue: <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hltfst/lang/Table.cfm?Lang=E&T=11&Geo=00> ; language spoken at home <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hltfst/lang/Table.cfm?Lang=E&T=31&Geo=00>; official languages: <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hltfst/lang/Table.cfm?Lang=E&T=21&Geo=00>

¹⁵ Implementation costs are those incurred when first introducing a new policy be it a new tax or a new language .This could include in this case of a language policy new signage, translation of existing documents or language training of existing staff. Ongoing/ recurrent costs are day to day costs such as translating new documents or offering a bilingualism premium to staff. One can think of them as respectively stock and flow associated costs.