

Linguistic Diversity and Preferences: Econometric Evidence from European Cities

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ABSTRACT

This multidisciplinary study adopts an econometric analysis for investigating how different characteristics determine the choice of the language used in the signs of a shopping street in two selected minority language cities. We use a dataset containing about 200 observations collected in the main shopping streets of the cities of Donostia (Spain) and Ljouwert (The Netherlands). The results corroborate the important assumption that linguistic landscape, multilingualism and the choice of the language (even in a street sign) is an individual and a social preference. Understanding linguistic preferences' structures is preliminary to the target and design of proper linguistic and social policies.

JEL Classification: C01, R20, Z13.

Keywords: Linguistic Diversity, Street Sign, Probit Model, Linguistic Landscape, Minority Language.

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1 INTRODUCTION

Taking a walk in the main shopping street of a city is a diffused habit mostly aiming at purchasing, window shopping, meeting friends, having a coffee, and many other leisure activities. Usually shopping streets are characterized by a high number of lights, traffic, crowd, vitality and movement. Usually, shopping streets contain signs on the shopping windows, on the buildings, at the street corners. Apparently street signs mostly convey information. However, linguists highlight that signs, including street signs, are symbols that codify and synthesize the linguistic landscape of a city. The linguistic landscape is: *‘The language of public road signs, advertising billboards, street names, place names, commercial shop signs, and public signs on government buildings combines to form the linguistic landscape of a given territory, region, or urban agglomeration. The linguistic landscape of a territory can serve two basic functions: an informational function and a symbolic function’* (Landry and Bourhis, 1997: 25). Therefore, signs and street signs are important indicators of linguistic diversity¹ and represent a broad field of study for linguists.

At a deeper reflection, however, there are at least four main reasons why signs are important to economists². First, signs convey information in order to solve the problems generated by asymmetric information. Since the seminal work by Akerlof (1970) a cornerstone of economic theory is that asymmetric information generates market failures. Market failures imply that the market does not clear at the competitive, shadow price equilibrium. This means that fewer consumers (with respect to the perfect competition structure) will buy the product (because they are not aware of the product’s existence or characteristics) and fewer firms will offer the product. Therefore, prices will be higher than the competitive equilibrium and the traded quantity will be less. In addition, a sign can convey information about the product’s quality and

¹ Linguistic diversity has been broadly defined as the *‘range of variations exhibited by human languages’* (www.terralingua.org).

² For a survey of the economics of signs, see Ramello (2005).

origin. Second, signs help to minimise transaction costs³. Clearly, a sign can help to minimise *ex ante* transaction costs, by conveying useful information. Third, signs “signal” important information about international brands, by providing mediation of reputation that cannot be maintained by direct familiarities. Fourth, signs are an indirect form of advertising and are useful in order to attract customers. The shape, language, font, type, information contained in a sign can attract customers, just like publicity.

If we focus on street signs, we can point out that street signs provide a representation of the linguistic landscape in the urban setting they are located. The language on the street sign, in fact, (also) conveys information on individual and social preferences for the linguistic landscape. Therefore, the article’s working thesis is the following: the choice of a particular (national, international and/or minority) language in street signs in multilingual landscapes reveals the agents’ preference structure for that language and can be measured by using economic valuation methods.

In particular, we address the following questions:

- (1) Is the linguistic landscape represented by street signs generated by individual and social preferences for the language/languages?
- (2) is it possible to empirically capture a relational link between the language on the sign and the social, economic, informative, symbolic message it conveys?

This article, therefore, focuses on the study of linguistic diversity in linguistic landscapes and it is a joint effort from an interdisciplinary perspective: sociolinguistics and economics. The specific aim of this article is to perform an econometric analysis of different linguistic landscapes, by focusing on the main shopping streets in Donostia and Ljouwert so as to contribute to the study of

³ Williamson (1985) defines transaction costs as those costs associated with the problem of contracting. There are two types of transaction costs: (1) *ex ante* costs: “*costs of drafting, negotiating, and safeguarding an agreement*” and (2) *ex post* costs: “*maladaptation costs*”; costs of renegotiating contracts in response to misalignments; set-up and operating costs of governance structures for dispute resolution; costs of effective secure commitment.

linguistic diversity and sustainability from a multidisciplinary (economic and linguistic) approach. The study is important to design targeted linguistic and economic policies. To our knowledge, this is the first economic work in this field and one of the few in economics of languages⁴. Our multidisciplinary study adopts the economists' empirical research methods (econometric analysis) in order to investigate whether and how different commercial, economic and linguistic characteristics, indicated in the signs of the main shopping streets affect the choice of the language used. Therefore, our study represents a primer in order to test the econometrics of multilingual signs and understand what is in a sign.

The work is organized as follows. Section 2 describes the Frisian and Basque Countries linguistic landscape. Section 3 and 4 provide information about the adopted data and descriptive statistics. Section 5 presents the econometric analysis and selected results. Section 6 discusses the results in a public policy perspective. Section 7 concludes.

2 THE BASQUE COUNTRY AND FRIESLAND

The data for the study of the linguistic landscape reported in this article have been collected in the Basque Country and Friesland. Both regions have an autochthonous language, Basque and Frisian, which are considered minority languages.

The Basque Country extends over an area of approximately 20,700 km² in the North of Spain and the South of France at the Atlantic border. It covers the Basque Autonomous Community, the region of Navarre and Iparralde. The total Basque population is approximately three million, 91% being Spanish citizens. The percentage of bilinguals (Basque-Spanish or Basque-French) for the whole of the Basque Country is 27%, and 14.5% is passive bilingual (only comprehension skills in Basque and limited production). The number of

⁴ See the seminal papers by Fidrmuc and Ginsburgh (2007), Ginsburgh, Ortuno-Ortin, and Weber (2005); Ginsburgh and Weber (2005), Ginsburgh, I. Ortuno-Ortin and Weber (2007).

bilinguals (Basque-Spanish) in the city of Donostia-San Sebastian is higher, 33% of the population. San Sebastian has approximately 180,000 inhabitants. Basque and Spanish are official languages in the Basque Autonomous Community since 1979. The Basque Government has a strong policy to promote the teaching and use of Basque. This policy has had some effect in restoring the status of Basque, but Basque is still a language at risk and only 11.9% of the population uses it more than Spanish.

Friesland is one of the twelve provinces of the Netherlands. The province is located in the northwest. Its territory has a surface of 3,360 km². Friesland has a population of 646,000 (2010), which is equal to 190 inhabitants per km². The capital is Leeuwarden (Ljouwert in Frisian), which has some 91,000 inhabitants. Approximately 94% of the population can understand Frisian, 74% can speak Frisian, 65% can read it and 17% can write the language. Over a period of more than 25 years there has been a small decline in speaking proficiency and some improvement in writing abilities. There is, however, an ongoing language shift among the younger generations towards Dutch as a first language. Frisian is relatively strong in the domains of the family, work and village community, but Dutch dominates in the more formal domains of education, media, public administration and law). The Frisian language has been officially recognized as the second language of the Netherlands and there is general political agreement that it is the government's duty to protect and promote Frisian. However, the policy plans have a non-committal character and they have hardly been implemented.

The increasing spread of English in Europe can also be seen both in Friesland and in the Basque Country. In both regions English is becoming part of the linguistic landscape. It is taught at schools in Friesland from the end of primary school (10-year olds), whereas in the Basque Country, English is taught in most schools from the age of four. There are important differences between the Netherlands and Spain regarding the knowledge of English. According to the Eurobarometer (2012), in the Netherlands 94% of the population can speak at least one other language apart from their mother

tongue and this percentage is only 46% in Spain. This foreign language is in many cases English. The self-assessed ability in English is rather high in the Netherlands, where over 31% of the population rates its knowledge of English as “very good”, but much lower in Spain, where only 13% of the population is in the “very good” category (Eurobarometer 2012).

3 THE DATASET

The dataset contains information about the linguistic landscape in Leeuwarden (Ljouwert) and San Sebastian (Donostia). Observations were collected in the cities’ main shopping streets, in order to allow for a certain degree of comparability. The dataset for Leeuwarden contains 103 observations (language signs) and related characteristics (typo of sign, language on the sign and so on); the dataset for San Sebastian contains 104 observations (language signs) and related characteristics. The *corpus* of this study includes a complete inventory of the linguistic landscape of just one street in the Basque Country and one street in Friesland. The streets selected were main shopping streets and both had a length of approximately 600 meters. A total of 975 digital pictures of street signs were taken and 207 units were distinguished: 104 in Donostia and 103 in Ljouwert. Each establishment but not each sign was considered the unit of analysis (see Cenoz and Gorter 2006). The collected signs convey information about different characteristics of the sign as shown in Table 1.

4 DESCRIPTIVE STATISTICS

In order to highlight some economic relations among the variables, we start by calculating the distributions of some selected variables. Such a non parametric exercise has a twofold importance. First, it allows to understanding potential relationships among selected variables. Second, it is preliminary to the definition of the proper parametric exercise and related empirical specification selection. Tables 2 and 3 report the non parametric

distribution for the variables “*language on the sign*” (Lansign) and “*branch*”, respectively, for Donostia and Ljouwert.

Table 1. Selected variables

Number	Variable	Description
<u>Economic Information</u>		
1	Type of information conveyed by the sign (Commercial, Informative, Institutional)	
2	Branch	Branch indicated by the sign (e.g. “street sign”, “shop”, “garage”, “bar & restaurant”; “school”; “bank”, “ATM”, “poster”, “health care”, “commercial sign”, “hairstylist”, “repair shop”, “official building”; “estate agent”; “movie theatre”; “hotel”; “other”).
3	Type of Shop	Type of shop indicated by the sign (e.g. “Clothing”; “books”; “food”; “electronics”; “furniture”, “jewellery”; “perfume”; “optician”; “flower”; “music”; “suitcases”; “lottery”, “other”).
4	Chain or Independent	Independent: regional chain; national chain; international chain
5	Number of languages of the sign	Whether the sign contains one or more languages
6	Language of the sign (Lansign)	Whether the sign is written in the official (national), minority languages; international languages, a mix of them or in invented languages.
<u>Linguistics Information</u>		
7	First, second and third language on the sign	Whether the (respectively) first, second or third language on the sign is the minority, national, international language or a mix of them.
8	Size	Size on multilingual sign
9	Fonts	Type of font
10	Information	Type of information conveyed in different languages
11	Translation	Type of translation (e.g. word to word, free, no translation, and so on)
12	Function	Function of the text (informative; symbolic or both)
13	Grammar	Grammar use and correctness
14	Lexis	Lexis correctness
Number of Observations: San Sebastian (Donostia) 104, Leeuwarden (Ljouwert) 103.		

We can see that the highest percentage corresponds to the majority language, Spanish (36.5%), but that Basque and Spanish are also common in street signs (22.11%). When we look at the use of Basque we can see that either on its own or with other languages Basque is used in 50% of the signs. English is the most common foreign language, and it is used on its own or in combination with other languages in 27% of the signs. Almost two-thirds of the signs (64%) in Ljouwert are written in only one language, but 36% in two languages and 8% in three or more.

Table 2: Descriptive statistics (Donostia)

Language on the sign	Observations (percentage,%)
Basque	13 (12.5)
Spanish	38 (36.5)
English	4 (3.8)
Basque, Spanish	23 (22.11)
Basque, English	2 (1.9)
Spanish, English	6 (5.7)
Basque, Spanish English	10 (9.6)
Basque, Spanish, German	1 (0.9)
Basque, Spanish, English, French	4 (3.8)
Basque, Spanish, English, Japanese	1 (0.9)
Basque, Spanish, English, French, German, Italian	1 (0.9)
Spanish, French	1 (0.9)

Table 3: Descriptive statistics (Ljouwert)

Language on the sign	Observations (percentage,%)
Frisian	3 (2.9)
Dutch	55 (53.3)
English	6 (5.8)
Frisian, Dutch	2 (1.9)
Dutch, English	32 (31.06)
French	1 (0.9)
Invented Language	1 (0.9)
Invented Language, Dutch	1 (0.9)
Local Dialect	1 (0.9)
Dutch, French	1 (0.9)

So, in Ljouwert most of the signs are monolingual. For the minority language we observe a substantial difference between Frisian and Basque. Frisian appears on its own in only 3% of cases, it is present in a small number of Frisian/Dutch bilingual signs and it is completely absent in multilingual signs. The minimal presence of Frisian as a written language on the signs reflects the overall modest importance of this language in the written form in society in general. Frisian is predominantly a spoken language (over half the population can speak Frisian), while the number of documents, forms, books, journals, etc in Frisian is rather minimal when compared to Dutch.

On the contrary, Basque has a stronger presence in monolingual signs with about one in every eight signs (12%). When we consider all the signs where the Basque language is involved, the total comprises half of all the signs (12% monolingual, + 22% bilingual Basque-Spanish + 2% Basque-English + 10% Basque-Spanish-English + a few of the other combinations also involve Basque: amounting to over 50%). We know that Basque is spoken by about one third of the population, but as a written language its importance is clearly shown in the linguistic landscape. The acceptance of Basque as a written language is high in all sectors of society. Here, Ljouwert (Friesland) and Donostia (Basque Country) differ to a large degree.

When we turn to the socially dominant language in each case, that is Dutch in Ljouwert and Spanish in Donostia, we also see some differences, but they do not seem as important. In Ljouwert Dutch is present in 91% of all signs, either monolingual Dutch in over half of the signs (53%) or bilingual or multilingual signs (31%+ 2% +5%). Dutch is not present in 9% of the signs (3% Frisian, 6% English). Therefore, Dutch is obviously the dominant language in the linguistic landscape of Ljouwert. Spanish is the most common language in Donostia with over one third of all signs in Spanish only (36%). If we add to this figure the bilingual and trilingual signs involving Spanish, we see that Spanish can be found in 82% of the signs and in this sense Spanish dominates the linguistic landscape (22%+6%+10%+8%).

As far as English is concerned, the difference between Ljouwert and Donostia in monolingual signs is small, i.e. 6% and 4%, respectively. However, when we add all the signs that include English, then we see that English is present in 37% of all signs in Ljouwert (6%+31%) and only in 28% of all signs in Donostia (4%+6%+2%+10%+6% of the combinations). Other foreign languages have a very limited presence with some signs including some words in French or German.

5 EMPIRICAL STRATEGY AND ESTIMATION RESULTS

The empirical strategy aims at understanding the choice of a language on the different types of signs. In particular, we want to understand whether the linguistic landscape captured by linguists in the main streets of two European cities is generated by random selection of linguistic signs, or whether it reflects a causal relationship between personal and social preferences. Therefore, our research continues by attempting to answer the following question: how do different characteristics (type of shop, branch, chain, institution and so on) affect the choice of the language used in the sign? We are primarily interested in estimating a set of simple relationship between the probability that a selected (minority, international, national, a combination of two or more) language is on the sign and some explanatory variables. A (general) relationship can be modelled as follows:

$$P\{y_i = 1|x_i\} = G(x_i, \beta) \quad (1)$$

for some functions $G(\cdot)$. Equation (1) says that the probability of having $y_i = 1$ (a selected language) depends on the vector x_i containing characteristics and variables that positively or negatively affect that probability⁵. In order to address the research question, we consider only the population of signs with a selected minority, international, national or combination of language(s). In

⁵ The function $G(\cdot)$ should take on values in the interval $(0, 1)$ only. Attention can be restricted to the function $G(x_i, \beta) = F(x_i, \beta)$. As $F(\cdot)$ also has to be 0 and 1, $F(\cdot)$ can be chosen as some distributional function. Common choice is the normal standard distribution function, leading to the probit model (see Verbeek).

this way, we can refine the analysis by using a sample of selected languages and check whether and how the different economic and informative characteristics affect the choice of the language for the sign. In this case, the OLS estimation method would not be efficient, because the sampling process might imply that the variance of the error term is not constant, but dependent upon the explanatory variables. To solve this problem, we can specify the likelihood function of the sample⁶ and then estimate the obtained probit models by maximum likelihood.

In the case at issue, the selected probit specifications attempt to primarily check whether the probability to have a specific language on the sign depends, among the others, on the type of shops, chains, institutions, and other sign characteristics in order to capture a causal relationship (if any) among language choice and message conveyed by the sign. After several checks, we estimate the following probit general empirical specification(s):

$$\Pr | \text{LanguageType}_{i,k} = \beta_0 + \beta_j \text{characteristics}_i + \varepsilon_{i,kj} \quad (2)$$

where, the dependent variable *LanguageType* represents the *k-th* type of language (minority, national, international or a combination of them) for sign *i*; β_0 is the constant; β_j are estimators for the *j-th* considered (informational, commercial, institutional, linguistic, grammatical, graphic and so on) characteristics mostly represented by dummy variables, contained in the *i-th* sign and $\varepsilon_{i,k,j}$ is the error term. Table 4 reports selected probit results for San Sebastian and Table 5 reports selected probit results for Leeuwarden. It is important to point out that the analysis is performed in a very similar way for both cities, with the exception of the analysis of bilingual signs. As for the signs that combine two languages, following the linguists' expertise, we select Spanish (national language) and Basque (minority language) for Donostia, and Dutch (national language) and English (international language) for Ljouwert. The choice of such asymmetrical analysis of bilingual signs is due to

⁶ It is a common choice to opt for the standard normal distribution function leading to the probit model, and the standard logistic distribution function, which results in the logit model.

the different cultural and linguistic backgrounds. Basque and Spanish, in fact, are used in a dichotomous way because Basque is linguistically very different from Spanish. There are intensive local governmental policies to create incentives⁷ to use and speak Basque.

Table 4. Probit Estimation Results for Donostia

Dependent Variable	English	Basque	Spanish	Spanish + Basque	Basque + Other Languages
National chain	1.316***	-	-	0.98*	-
Independent chain	-	-	0.32*	-0.18*	-
International chain	1.16*	-	-	-	-
Shop	-0.25**	-1.47***	-	0.68*	-
ATM	-	-	-	0.76	-
Commercial signs	-	-	-	-	0.063**
Fashion shop	-	-	-	-	1.08**
Other	-	-0.53	-	-	-
Poster	-	-	1.61***	-	-
Bars & restaurants	-	-1.10*	-0.64	1.45***	1.47**
Street sign	-	0.17	-	0.34***	-
Same size	-	-	-	1.62***	-
Same information	-	-	-	0.48	-
Size: majority language bigger	-	-	-	-	-0.55***
Constant	-1.78***	-0.43	-0.60***	-1.56***	-0.67
Pseudo R ²	0.26	0.29	0.20	0.42	0.22
log-likelihood	-17.294	-29.51	-59.091	-36.09	-14.7

Note: computations were performed with STATA. *** = 1% statistically significant; ** = 5% statistically significant; * = 10% statistically significant.

⁷ These incentives are both monetary (like investment support to businesses that adopt commercial signs in Basque) and regulatory (like the public provision of the linguistic landscape).

Frisian is more spontaneous (it is based on oral tradition; there are few governmental incentives to study the minority language) and similar to Dutch. In addition, English is highly spread and spoken in The Netherlands. For this reason, we have decided to consider different combinations of languages in the analysis of the bilingual signs for the selected cities. The same reasoning holds for the selection of the multilingual signs' dependent variables in the two selected cities.

Table 5. Probit Estimations Results for Ljouwert

Dependent variable	English	Frisian	Dutch	Dutch + English	Dutch+ Other languages
Independent chain	-	-	-	0.94***	0.18
Regional chain	-	-	2.49***	-0.49*	-
National chain	1.71***	-	0.89**	0.60*	-
International chain	1.77**	-	-	-	-
Bars & restaurants	-	-	-	-0.39*	0.90*
Fashion shop	-	-	-	0.06	1.19*
Furniture shop	-	-	1.10***	-	-
Jewellery shop	-	-	0.61	-	-
Shop	-	-	1.16***	-	1.51*
Official building	5.90***	2.14***	-	-	-
Street sign	-	2.83***	-	-	-
Poster	-	-	1.85***	-	-
Size: foreign Language bigger	6.12***	-	-	-	-
Same font	-	-	-	-	0.94*
Constant	-7.79***	-3.93***	-	2.44***	-0.04**
			0.66***	-1.33***	-2.39***
Pseudo R ²	0.35	0.26	0.27	0.43	0.25
Log-likelihood	-15.37	-10.06	-59.05	-39.84	-17.29

Note: computations were performed with STATA. *** = 1% statistically significant; ** = 5% statistically significant; * = 10% statistically significant.

We point out some methodological remarks that are common to both cities. The linguistic variables are never statistically significant in the analysis carried out, where the dependent variable is a single language (Dutch, English or Frisian). However, some linguistic variables become statistically significant when a combination of languages is considered. The pseudo R^2 indicators are rather acceptable for all estimation results, since for this kind of studies pseudo R^2 (indicating the suitability of the model) are rather low. This might imply that the selected empirical model and estimation techniques have a good capability to test the considered relationships, given the dataset constraints (small dataset).

From the Basque results (Table 4) we can highlight the following points:

- The probability that the language on the sign is English is positively affected by the “*international chain*” and “*national chain*” variables, and negatively affected by the “*shop*” variable.
- The probability that the language on a sign is Basque is positively affected by the “*street sign*” variable and negatively affected by the “*shop*” and “*bars & restaurants*” variables.
- The probability that the language on a sign is Spanish is positively affected by the “*poster*” and “*independent chain*” variables and negatively affected by the “*bars & restaurants*” variable.
- The probability that the languages on the sign are both Spanish and Basque is positively affected by the “*national chain*”, “*shop*”, “*ATM*”, “*bars & restaurant*” and “*street sign*” variables and negatively affected by the “*independent chain variable*”.
- The probability of a bilingual sign is determined by linguistic variables: if the selected languages have the same size and convey the same information, then the sign is bilingual (Spanish and Basque).
- Finally, the probability of a sign in a combination of Basque and other languages (German, Italian, Japanese, French...) is positively affected by the “*commercial sign*”, “*bars & restaurants*”, “*fashion*”

shop” variables, and negatively affected by the fact that the majority language (Spanish) has a bigger size on the sign.

From the Frisian results (Table 5) we can highlight the following points:

- The probability that the language on the sign is English is positively affected by the “*international chain*”, “*national chain*”, and “*shop*” variables, and negatively affected by the “*street sign*” variable.
- The probability that the language on a sign is Frisian is positively affected by the “*shop*” and “*official building*” variables.
- The probability that the language on a sign is Dutch is positively affected by the “*street sign*”, “*regional chain*”, “*national chain*”, “*furniture shop*”, “*jewellery*” variables, and negatively affected by the “*fashion shop*” variable.
- The probability that the languages on the sign are both English and Dutch is positively affected by the “*independent chain*”, “*national chain*” and “*fashion shop*” variables, and negatively affected by the “*regional chain*” and “*bars & restaurants*” variables.
- Linguistic variables affect the probability that the sign has a certain linguistic content: if the size of the foreign language is bigger, then the adopted sign is bilingual (Dutch and English).
- Finally, the probability that the language on the sign is another language (local dialect, invented language) or a combination of Dutch and other languages is positively affected by the “*independent chains*”, “*bars & restaurants*”, “*fashion shop*”, “*jewellery*”, “*poster*”, and “*same font*” variables. The probability is negatively affected by the variable that signals that the foreign language has a bigger size in the sign.

6 DISCUSSION AND POLICY IMPLICATIONS

The study of the languages used in signs can contribute to the study of linguistic diversity and policy. Linguistic diversity, in fact, can reflect the different strengths of the languages and the relative integration of their speakers. The languages of signs are also related to identity and to language policy. In sum, the study of languages used in signs can shed light about social preferences for linguistic landscape and related policies. The effects of multilingualism, in fact, have recently come to the forefront of public policy debates. Political reality shows that linguistic issues and, in particular, the treatment of minority languages are almost unparalleled in terms of their flammability and emotional appeal, much more than any other question of resource allocation or responsibility sharing within a policy. In fact, multilingualism or linguistic diversity in a heterogeneous society provide extraordinary challenges and room for policies which may have important economic implications in shaping the flows of interregional or international trade, investment and migrations. In addition, multilingualism or linguistic diversity in a society is an important phenomenon that can generate welfare gains or losses resulting from the economic interactions between individuals, regions or countries (Ginsburgh and Weber 2006).

In this context, our study highlights two main results:

- (1) the dominance of English for commercial signs in both cities;
- (2) a different use of the minority languages in the two European cities.

The empirical results can provide some hints for policy discussion, since signs provide a representation of linguistic landscape and the language on the sign conveys information on social preferences for linguistic landscape.

With respect to the first point, in our interpretation, English is not so much useful for the factual information it transmits, as for its connotation value in commercial signs. The economic agents can recognize that the message is in English and this activates values such as international orientation, future orientation, success, sophistication or fun orientation (Piller 2003). This is

particularly evident in the Netherlands and Ljouwert where English is widespread and broadly used for commercial purposes. In terms of policy we have to highlight that the broad use of English might generate a potential loss of other languages, in general, and minority language, in particular⁸. According to Philipson (1992), English is considered a threat for linguistic diversity. From the linguists' point of view, the death of a language is a significant loss, because it implies a loss of inherited knowledge. Cultures are transmitted through languages, and languages also reflect the history of the people who have used them. Krauss (1992) estimates that 50% of languages could die in the next 100 years and that in the long term 90% of the world languages⁹ could die. Therefore, it emerges a trade-off between the positive commercial impacts of using English in street signs and the negative potential loss of the other national and minority languages. The policy maker should take into consideration such trade-off.

With respect to the second point, in Donostia, most street signs are bilingual (Basque and Spanish), whilst in Ljouwert, Frisian is used to indicate official buildings and some shops, and its use is less common. Basque has to be formally studied and it is used in contexts others than those where Spanish is normally spoken. There are intensive local governmental policies to create incentives to use and speak Basque. Frisian is more spontaneous (it is based on oral tradition; there are few governmental incentives to study the minority language) and similar to Dutch. In our interpretation, Basque and Spanish have to be considered as complementary goods, with a positive crossed elasticity of demand, where the price of the minority language is represented by the government investment (subsidy) in Basque. The Basque government provides incentives for the study and the use of the minority language (and creates a barrier to entry in selected job markets). However, Spanish is

⁸ From the economic analysis of the impacts of English on other languages, see the seminal work by Ginsburgh and Weber (2005). The authors consider a linguistically diversified society that has to select a set of languages to be used for official purposes, like the European Union. The main results show that it could be unwise to select English alone as a working language.

⁹ Ethnologists classify 516 languages as nearly extinct because they are spoken by just a few elderly people (Gordon 1996)

resilient and still very present in the linguistic landscape (for instance through the street signs). Therefore, following a strict microeconomic interpretation, if the price of Basque (subsidy to Basque) increases and the consumption of Spanish does not decrease, we assume the two languages are consumed as complementary goods.

Frisian and Dutch are (imperfect) substitutes (since some words even overlap), with a negative crossed elasticity of demand. There are few official policies to create incentives or subsidize the use of more Frisian. The use of the minority and national/official languages occur in different daily life and/or official situations and the languages are used as substitutes. Frisian is a confidential language, used in family and among friends. At the same time, and contrary to the Donostia results, the probability that the street sign contains a minority language (Frisian) is positive when the sign indicates official buildings. This result might convey the idea that the minority language is used to strengthen and highlight the identity of the minority community. In our microeconomics interpretation this might signal, that the languages are used in those situations where their price is cheaper. The price of the language, for instance, can also be non-monetary: integration, social cohesion, cultural identity. Therefore, Frisian communities switch to the cheapest language when the price of one of them increases. For instance, the price of using Dutch with friends might result higher than the price of Frisian because it might generate a more difficult social integration among locals. In this case, it is economically rational to switch to Frisian. Therefore, the two languages might be considered as substitutes.

More in general, our study might contribute to the policy debate on languages preservation, and to address the linguists' question whether it is important to maintain the largest possible number of languages in order to preserve multilingual landscapes. Crystal (2000), for instance, provides five main reasons to justify the importance of language diversity: (1) languages represent ecological diversity; (2) languages express identity; (3) languages are

repositories of history; (3) languages contribute to the sum of human knowledge and (5) languages are interesting in themselves.

The article suggests that the linguistic landscape and the use of languages represent individual and social preferences. A methodologically sound assessment of linguistic preferences (even expressed by street signs collected and analysed by linguists) can help assessing and defining proper policies. In the economic framework, in fact, *“...not all “non-economic” behaviour is beyond economic analysis. Our maintained assumption as economists is that individual behaviour is consistent with self-interest. As its weakest, self-interest only means that choices conform to some underlying preferences ordering that is complete, reflexive and transitive, and, hence, some utility function can be used to describe behaviour. However, the assumption of self-interest does not tell us what variables are in the utility function. What does? Our methodology is that people themselves, through their actions, will do so.* (Andreoni and Miller 1998: 15).

7 CONCLUSIONS

In this work, we have performed an econometric analysis in order to investigate whether and how the different commercial, institutional and linguistic characteristics of the signs of the main shopping streets affect the choice of the language used in the sign. We have worked with a dataset containing about 200 observations collected in the main shopping streets in Donostia and Ljouwert and regressed probit models with the maximum likelihood estimation method. The main results are different for the two selected, minority language cities and are summarized in Table 6.

In the stream of other economic works on multilingualism and linguistic landscape, the results corroborate the important assumption that multilingualism and the choice of the language (even in a street sign) is both an individual and a social preference. Understanding individuals' and social linguistic preference structures is preliminary to the target and design of proper linguistic and social policies. Languages can contribute to human

welfare, social cohesion or integration. Linguistic diversity is not only part of cultural diversity but it can be its basis. A language is a crucial part of the heritage of a specific community. It shapes and builds its identity in a similar way as its physical heritage does. Therefore its existence needs to be valued and preserved as we do with the cultural and environmental heritage of a region. In other terms, many of the considerations that one can make for cultural heritage goods seem to hold true for languages.

Table 6: Summary of main results

	<i>English (NL)</i>	<i>English (S)</i>	<i>Dutch</i>	<i>Spanish</i>	<i>Frisian</i>	<i>Basque</i>	<i>Dutch + English</i>	<i>Spanish + Basque</i>	<i>Dutch + Others (NL)</i>	<i>Basque + Others (S)</i>
Variables positively affecting the probability that the sign is in the language			Street sign; national chain; regional chain; furniture shop; jewellery shop	Poster; independent chain; chain	Shop; official independent chain; building	Street sign	Independent chain; national chain; fashion shops; size foreign language bigger	National chain; shop; ATM.; bars & restaurant street sign; language same size in the sign; same information	Independent chain; bars & restaurant, fashion shops, jewellery shop, poster same font	Commercial sign; fashion shop; bars & restaurants
Variables negatively affecting the probability that the sign is in the language	Street sign	Shop	National chain; fashion shop	Bars & Restaurants		other; bars & restaurants	Shops; Regional chain; bars & restaurants	Independent chain language bigger	Size of the foreign language bigger	Size of the majority language bigger

Taking into account the importance of linguistic diversity requires preserving it. In order to do so, it is necessary to develop specific policies to try to avoid the decline of weak languages when those languages are individually and socially preferred and represented in urban landscape. Language preservation refers to ‘deliberate efforts to influence the behaviour of others with respect to acquisition, structure or functional allocation of their language codes’ (Cooper 1989: 45). However, preliminary to all this, researchers have to be able to

identify, distinguish and measure individuals and social preferences for languages. There is much research work to be developed along those lines.

REFERENCES

- Akerlof, G. 1970. "The Market for Lemons: Quality Uncertainty and the Market Mechanism" *Quarterly Journal of Economics* 84: 488-500.
- Andreoni, J, and J. Miller. 1998. "Analysing Choice with Revealed Preferences: is Altruism Rational?". In: C.H. Plott and V. Smith, eds. *The Handbook for Experimental Economic Results*. Elsevier, pp. 1-16.
- Cenoz, J. and D. Gorter. 2006. "Linguistic Landscape and Minority Languages". *International Journal of Multilingualism*. 3: 67-80.
- Crystal, D. 2000. *Language Death*. Cambridge: Cambridge University Press.
- Cooper, R.L. 1989. *Language Planning and Social Change*. New York: Cambridge University Press.
- Eurobarrometer. 2012. *Europeans and languages* European Commission. Communication from the Commission to the Council, the European (accessed June 2012).
- Fidrmuc, J. and V. Ginsburgh. 2007. "Languages in the European Union: The Quest for Equality and its Cost," *European Economic Review* 51: 1351-1369.
- Ginsburgh, V., I. Ortuno-Ortin, and S. Weber. 2005. "Language Disenfranchisement in Linguistically Diverse Societies. The case of European Union". *Journal of the European Economic Association* 3: 946-965.
- Ginsburgh, V. and S. Weber. 2005. "Language Disenfranchisement in the European Union". *Journal of Common Market Studies* 43: 273-286.

- Ginsburgh, V., I. Ortuno-Ortin, and S. Weber. 2007. "Learning Foreign Languages. Theoretical and Empirical Implications of the Selten and Pool model". *Journal of Economic Behaviour and Organization* 64: 337-347.
- Gordon, R.G. 2005. *Ethnologue: Languages of the World*. Dallas: SIL International.
- Krauss, M. 1992. "The World's Languages in Crisis". *Language* 68: 4-10.
- Landry, R. and R.Y. Bourhis. 1997. "Linguistic Landscape and Ethnolinguistic Vitality: An Empirical Study". *Journal of Language and Social Psychology* 16: 23-49.
- Phillipson, R. (1992). *Linguistic Imperialism*. Oxford: Oxford University Press.
- Piller, I. 2003. "Advertising as a Site of Language Contact". *Annual Review of Applied Linguistics* 23: 170-183.
- Ramello, G.B. 2006. "What's in a Sign? Trademark Law and Economic Theory". *Journal of Economic Surveys* 20: 547-565.
- Veebek, M. 2002. *A Guide to Modern Econometrics*. Wiley & Sons
- Williamson O. 1985. *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*. New York: The Free Press.