EALE 2006

Donald R. WILLIAMS, The Economic Returns to Multiple Language Usage in Western Europe, Kent State University, Department of Economics, Kent, Ohio, USA, and CEPS/INSTEAD. E-mail: dwilliam@bsa3.kent.edu

To what extent are there economic returns to learning a second or third language? Do the benefits differ according to country? This paper examines the return to multi-lingualism in the workplace. In particular, we estimate the effect that using an additional language in one's job has on earnings for a sample of workers in the European Community Household Panel survey. Log-earnings regressions are estimated by country with controls for standard human capital, job, and personal characteristics. Preliminary results indicate that the use of a second language in the workplace raises earnings by about 5 to 10 percent, but the results are sensitive to the specification used and vary across countries, occupations, and gender.

Theme: Education and Training
Keywords: Language Usage, Returns to Education, Multilingualism
JEL-Code: J24, J31

The Economic Returns to Multiple Language Usage in Western Europe

Donald R. Williams*

Kent State University
USA

CEPS/INSTEAD
Luxembourg

May 2006

Abstract

To what extent are there economic returns to learning a second or third language? Do the benefits differ according to country? This paper examines the return to multi-lingualism in the workplace. In particular, we estimate the effect that using an additional language in one's job has on earnings for a sample of workers in the European Community Household Panel survey. Log-earnings regressions are estimated by country with controls for standard human capital, job, and personal characteristics. Preliminary results indicate that the use of a second language in the workplace raises earnings by about 5 to 10 percent, but the results are sensitive to the specification used and vary across countries, occupations, and gender.

* I am grateful to Kent State University and CEPS/INSTEAD for support of this research, and to seminar participants at the 2005 EPUNet Conference and Carlo Klein for helpful comments on an earlier draft.

The Economic Returns to Multiple Language Usage in Western Europe

Introduction

Language acquisition is a form of human capital development that has received a considerable amount of attention among labour economists in the past two decades. Most of this work has focused on the case of immigrants for whom the majority language in their host country is different from their mother tongue. In general, mastery of the host language contributes ultimately to the economic assimilation of the immigrant. Presumably this is the ultimate goal of public policy in the United States that encourages learning English as a second language among immigrants and their children.[1]

In many countries, public policy encourages (requires) knowledge of a second (or third) language even among natives. In many cases this is derived from the official multi-lingualism of the country (e.g., Switzerland, Canada or Belgium), and the demands it creates on its citizenry. In other cases, however, it reflects the belief that knowledge of a second language is an integral part of a well-rounded, liberal education. [2] In any case, the acquisition of multi-linquistic skills is an investment in human capital that has the potential to increase the productivity of workers in the labor market.

On the other hand, the acquisition of these skills takes away from the acquisition of other skills that might be more important in the labor market and yield higher returns. It has been argued that in Luxembourg, for example, the focus on learning several

[1] See Grin and Vaillancourt (1997) for an analysis of public policy toward multilingualism.
[2] In the U.S., the extent to which public school students are required to study a second language varies considerably at the local level. Students who are in the "college prep" track generally study one language other than English, beginning either at the middle or high school levels. Universities generally have some language requirement, but these are not required by the state.

languages has decreased the extent to which children develop their mathematics and science knowledge and skills.

Since the investment in acquiring this form of human capital comes at some cost, it is important that we understand the returns to it. Our paper contributes to this understanding in several ways. Using data from the European Community Household Panel (ECHP) survey, we estimate the impact that use of a second language has on the earnings of workers in 14 countries in Western Europe. The paper differs from previous work in that it considers several countries, providing the opportunity for cross-national comparisons of the results. In addition, our focus on the use of the language on the job, as opposed to the level of proficiency in the language, is unique.

The paper is organized as follows: in the next section, we briefly summarize the literature regarding returns to language skills. This is followed by a description of the data and methodology used. Results of descriptive statistics are then presented and discussed, followed by the results from log-earnings regressions. Trade related sources of cross-country differentials are then explored. Concluding remarks and topics for further research are in the final section.

Literature Review

As previously noted, most of the previous work in this area focuses on the role that language plays in the economic success and/or assimilation of immigrants. Other work is closer to that presented here, in that it studies the returns to language skills even among natives. The results of each of these themes are summarized in turn, below.

Some of the earliest work regarding immigrants is found in McManus, Gould and Welch (1983) and McManus (1985), who study the earnings of Hispanic immigrants in the United States. They found that Hispanics who were fluent in English suffered no earnings penalty, but those who were "language deficient" had significantly lower earnings. This work was extended by Koussoudji (1988), who found that the effect of language deficiency reduced earnings within occupations, and also affected the occupational choices available to immigrants. She also found that the magnitude of the effect differed according to ethnicity, however, with much smaller effects for Asian immigrants than for Hispanic ones.

This basic result, that language deficiency among immigrants is a determinant of lower earnings, has subsequently been found to hold for other immigrant groups in the U.S. (Chiswick and Miller 1999, 2002) and for a variety of immigrant groups in other countries including Australia (Chiswick and Miller 1995), Canada (Chiswick and Miller 1995, 2003), Germany (Dustmann and Van Soest 2002), Israel (Chiswick 1998, Leslie and Lindley 2001) and the U.K. (Dustmann and Fabbri 2003, Lindley 2002). In addition, studies have found that language deficiency contributes to employment disadvantage for immigrants (Leslie and Lindley 2001, Dustmann and Fabbri 2003, Hayfron 2004). It should be noted that many of the studies above note the strong complementarity of language skill with other human capital measures, the endogeneity of language acquisition and earnings, and self-selection among immigrants.

Again, the basic result from the above is that for an immigrant to be most successful in a monolingual society, it is important to have a command of the language.

For immigrants not of the same mother tongue, this implies a return to bilingualism.[3] Several authors have also considered the case of *native* workers in *bilingual* societies. The results are mixed, with early studies finding no return to bilingualism. In their studies of language-based and gender-based wage differentials in Canada, Carliner (1981) and Shapiro and Stelcner (1981) included controls for Anglophones and Francophones who had also learned the other language (as well as monophones and immigrants who spoke neither language). Their results indicated little return to bilingualism. That is, native English-speakers who learned French earned no more than those who did not, for example.

More recent work has found a positive return to bilingualism. Using data from the 1990 census in an update to their study, Shapiro and Stelcner (1997) find a positive return to bilingualism for Francophones (but none for Anglophones). Grenier (1987) attempts to control for the fact that there was some migration in Quebec after the implementation of the language policy in 1977. After controlling for self-selection, he finds positive and significant returns to bilingualism among both groups, but also higher returns for Anglophones. In their study of segmentation of the Swiss labor market, Cattaneo and Winkelmann (2003) estimate that there is no difference in earnings between native French speaking workers who are working in a German-speaking region and their native German counterparts (and similarly in the French speaking region for native German-speakers). While not the point of their paper, this implies a return to having learned the second language in Switzerland.[4] Kalist (2005) examines the return to

[3] When the sample is limited to those who are proficient in English, however, Fry and Lowell (2003) find no return to bilingualism for immigrants in the U.S. after controlling for educational attainment. They also find no return among bilingual natives.

[4] The Italian canton was excluded from the analysis.

bilingualism within a single, narrowly defined occupation in the U.S. – registered nurses. Using data from a national survey, he finds a positive wage premium of up to 7 percent for knowing Spanish, with the return growing according to the proportion of the local (county) population which is Spanish speaking. In their study of the return to knowing both English and Welsh in Wales, Henley and Jones (2005) find similar rates of return, depending on the level of language ability of the individual.

One of the most interesting papers, and closest to this study, is the analysis of the Luxembourg labor market by Klein (2003). In Luxembourg there are three "official" languages: French, German, and Luxembourgish. In addition, a high proportion of the labor force has studied English. In his analysis of the wage gain arising from competency in these four languages, the language with the highest return is English. There is no significant wage effect of learning German or Luxembourgish, and for French there is an effect only for women. The fact that the return is to learning a language that is foreign to the nation is what sets this study apart from the others in the literature, and is the focus of the present paper as well. The question addressed in this paper is, is there a return to using a foreign language in one's work in other nations in Western Europe?

Methodology and Data

The basic model underlying the analysis is the human capital model of earnings determination, in which incomes are a function of productivity related characteristics such as educational attainment and experience, which differ according to individuals' investments in human capital. One form of investment is in the acquisition of language skills. We do not observe the skill level in this analysis, however, but rather only

whether the individual uses a second language (or more) in his work. We then write the underlying model as

$$y = f(\mathbf{Sn}, A, L, \mathbf{X}),$$

where y is the log of income, **Sn** are measures of educational attainment, A measures work experience, L measures language usage, and **X** is a vector of other worker personal and job characteristics that affect earnings. We can consider L to be an indicator of the language ability of the individual, as L=1 if $l > l^*$, 0 otherwise, where l^* is the critical value of language ability, l, required to use the skill on the job.

We choose a linear specification of the model, and estimate the parameters using both cross-sectional and panel data. Both OLS and fixed effects specifications are employed. For the fixed effects specification, both individual and time fixed effects are estimated, for the following model:

$$y_{it} = a + bS1_{it} + bS2_{it} + cA_{it} + dL_{it} + \mathbf{g}\mathbf{X}_{it} + v_i + u_t + e_{it},$$

where v_i and u_t are individual and time-specific fixed effects, respectively. The error term, e_{it}, is assumed to have the standard classical properties.

An alternative model, not used here, would be to use a predicted value of L, L*, in place of L as one of the independent variables. Unfortunately we are not aware of variables in the data set used that would serve as good instruments in this case.

The data is from the European Community Household Panel (ECHP) survey.[5] The ECHP is a cross-national, longitudinal survey of the populations of fifteen European nations, begun in 1994, although data is not available in all years for all countries. In 1995, over 60,000 households were surveyed. The most recent data available is from the year 2001. Unfortunately information about language usage is not included in all waves,

[5] See Peracchi (2002) for a description of the ECHP data.

so we are limited to the 1994-1999 time period for this analysis. The analysis is limited to individuals who are employed and 25-64 years old in each year. A balanced sample is used for the pooled regression analysis.

The primary variable of interest is constructed from the responses to the question, "Does your work involve use of a language other than (the official language in the country)?" If yes, then the respondent is also asked for up to three languages used.[6] The first variable used in our analysis is a simple dummy variable indicating whether any foreign language is used at work (FLANG). Dummy variables are also created identifying the first language listed among those used. As noted above, the language question is asked only in the first six waves. In addition, it is an ECHP question and is not included in the GSOEP, BHPS, or PSELL data sets. Consequently it is not available in the ECHP for Germany, the U.K., or Luxembourg after the third wave. Additionally, it is not available for Belgium after the third wave, and no data is available for some countries in the first wave. Data is available for the third wave for 14 of the ECHP countries, however, so we focus on that (1996) data for the cross-sectional analyses presented below.

The proportions of workers who indicated they used a second language at work in 1996 are presented in Table 1, by country. Clearly there is considerable variation across the countries studied. The proportion ranges from a low of about 6 percent in the U.K. to nearly 78 percent in Luxembourg. Generally speaking, the lowest proportions are found in the U.K., Ireland, and southern European nations. An exception is Greece. The highest proportions are found in the northern countries (Denmark, Netherlands, Belgium, Luxembourg), with Germany, Austria, France and Finland in the middle range.

[6] We are familiar with one other paper that has used this variable. See Tucci and Wagner (2003).

The interpretations of the data for the two multi-lingual countries, Belgium and Luxembourg, are somewhat problematic. In Belgium, for example, the most common language listed as the second language used is French, one of the official languages. Similarly a high proportion of the Belgians list Dutch as the second language used. Obviously it is not possible to distinguish between the use of the language in national or international contexts in any of the countries, but it is much more likely that the useage is national in nature in Belgium and Luxembourg. This raises one general weakness with the language data, that we have no information about the way in which the language is being used. That is, we do not know whether the usage is in casual conversation with co-workers, for example, or in reading technical sales reports.

Other variables that are used in the regression analyses are individual earnings, measures of educational attainment, occupational and industry dummy variables, gender, marital status, number of children, age, normal hours worked, firm size, health status, and national origin. Definitions for each of the variables used are presented in Appendix Table A1.

Language Usage Results

Referring again to Table 1, the language most commonly listed as the foreign language used is English in most countries.[7] The proportion that indicates they use English at work ranges from about 6 percent of workers in Spain and Italy to more than 25 percent of workers in the Netherlands and Denmark. Taken as a proportion of those who use any foreign language, we find the English usage rate to be at least 70 percent in Denmark, France, the Netherlands, Portugal, Spain and Austria, and more than 90 percent

[7] We have not made use of the second or third languages listed.

in Greece and Finland. French is the most common "second language" listed among workers in Belgium, Luxembourg, and the U.K.

Table 2 presents the proportion that uses any second language, broken down by broad occupational category, business sector of employment, educational level, and gender.[8] For the four occupational groupings listed in the table, we see that the highest usage of a second language occurs in the professional and managerial occupations in most countries. This is generally followed by clerks, with blue collar workers the least likely to use a second language. Exceptions to this pattern are found in Belgium, the Netherlands and Greece, where clerks are at least as likely to use a second language as are professionals and managers.

The business sector with the highest level of usage of a second language is the service sector in all countries except Belgium and Luxembourg, where the rate is higher in the industrial sector. As would be expected, the rate of usage of a second language is positively related with the level of educational attainment. The relationship appears to be very strong, though less so in Luxembourg where the level of usage of a second language is quite high even among the least educated. Finally, males are more likely than females to use a second language at work in all of the countries studied except Ireland, Greece and Portugal.

Returns to Language Usage

In order to estimate the returns to the use of a second language on the job, we estimate log earnings equations that include the FLANG and individual language dummy

[8] For descriptive statistics on language usage at the EU level and using more detailed occupational categories, see Tucci and Wagner (2003).

variables. The parameters are estimated separately by country. The regressions include additional variables to control for the effects on earnings of educational attainment, age (as a proxy for work experience), age squared, occupational status, sector of employment, marital status, children, hours worked, gender, firm size, health status, and nationality. Rather than present the coefficient estimates for all of these variables for all countries, only the coefficients on the language variables are presented here. The results for the remaining variables are available from the author upon request.

The results for two simple Ordinary Least Squares regressions using the 1996 cross-sectional data are presented in Table 3. The first two columns for each country give the coefficient for the FLANG variable and its standard error. The second two columns give the coefficients for each of the second languages used. Referring first to the "Any Flang" results, we find that use of a second language has a positive and statistically significant relationship with earnings in all of the countries studied, except the U.K. The estimates indicate that workers who use a second language at work earn about 8 to 12 percent more than those who do not in Germany, the Netherlands, Belgium, Italy, Spain, and Austria. Much higher estimates of the return (15 to 22 percent) are found in Denmark, Ireland, Greece, Portugal and Finland. The highest return is found in Luxembourg, where use of a second language is associated with nearly 30 percent higher earnings.[9]

The results for estimates of the returns to individual languages yield some interesting differences. For the most part, the overall return is similar to the return to using English in particular, and in many countries English is the only language that

[9] Given the dummy variable in the logarithmic specification, the return is estimated as EXP(coefficient) – 1.

appears to yield a significant return. This is true in Austria, Finland, Italy, Spain, and the Netherlands. But in many countries we find significant returns to using other languages as well. A substantial return to using French is found in Denmark, for example, as well as in Luxembourg, Greece, and Portugal. The use of German generates significant returns in Belgium, Luxembourg, and France, as does the use of Spanish in France, Italian in Luxembourg and Portugal, and Dutch in Belgium.

We expect that the returns to using an additional language might differ according to the type of work, and so in Table 4 present the regression coefficient on the FLANG variable when estimated separately by broad occupational grouping (prof/man, clerk, blue collar, and other). The estimated return to using a second language is found to be statistically significant predominately in the professional and managerial occupations in most countries. In addition, the return is positive and significant within "other" occupations in many northern countries, while it is significant within the clerk and blue-collar occupations in Italy, Greece and France. Regardless of occupation, there remain large differences in the magnitudes of the estimated returns across countries.

Also presented in Table 4 are gender-specific estimates of the returns to using a second language. In many countries the within-country estimates are of about the same magnitude across genders, but there are some notable exceptions. In Belgium, Ireland and Luxembourg, for example, the return to second language usage is large and significant only among females.[10] In France, Italy and Spain, on the other hand, the return is significant only for males. Except perhaps for gender differences in the occupational distributions across the countries, we have no explanation for these differential returns.

[10] This result is consistent with that of Klein (2003) for Luxembourg.

We should note that in the U.K. there appears to be no return to using a second language neither for any individual language nor among any particular sub-sample.

All of the estimates presented above are based upon OLS cross-sectional specifications of the log-earnings equation. Table 5 presents estimated coefficients for the FLANG variable in a fixed effects specification, using pooled data for waves 1-6 (or fewer, as available by country).[11] Results from a Hausman specification test indicated that the fixed effects model is more appropriate than an alternative random effects model. In all countries an F-test indicates that we can reject the hypothesis of zero fixed effects. We estimate the two-way model using TSCSREG in SAS version 8.

As seen by comparing the results in Table 5 and Table 3, the estimated returns tend to be much smaller and less likely to be significantly different from zero in the fixed effects specification. This suggests that unobserved productivity differentials might explain some of the return attributed to language usage in the OLS model. Nonetheless, positive and significant returns are still found in Denmark, the Netherlands, Luxembourg, Austria, Finland, and Greece. Most of the returns are in the 3 to 5 percent range, although in Denmark and Luxembourg the returns are much higher. Interestingly, we find a negative and significant return to second language usage in Belgium in the fixed effects model. We have no explanation for this result. Indeed, it should be noted that the return does not appear to be related to whether the country has a multi-lingual public policy, since Belgium and Luxembourg are at the opposite extremes in terms of the estimated returns.

[11] Due to data availability, only waves 1-3 are used for Belgium, Germany, Luxembourg and the U.K., and waves 2-6 are used for Austria and Finland.

Trade and cross-national differences

What other explanations might exist for the differential returns to foreign language usage across countries? One possibility is the "linquistic distance" between the second language and the primary language on the job (Chiswick and Miller 2004). The return might be higher if there is a greater linguistic distance between languages, as a return to the difficulty in acquiring the language. We might expect, therefore, the return to using English to be higher in Spain and Italy than the return to using French. And we might expect the return to using Chinese to be greatest across all the countries.[12] Alternatively, we might find the return to using English to be higher in Spain and Italy than it is in Germany. While an interesting topic, this is left for further research.[13]

Another explanation relates to patterns of international trade. We would expect workers in countries in which there is a high proportion of international trade to receive higher returns to learning (and using) foreign languages. This notion is explored here by computing the correlation between the estimated returns to multiple language usage in each country with several measures of the importance of trade in the country. Two broad types of measures were examined. The first type related to overall trade in general, and used exports as a share of GDP and imports as a share of GDP as measures. The second type related to a particular segment of trade, tourism. The measures used here included the number of hotel establishments in the country, the number of hotel

[12] Unfortunately there is no separate measure of usage of quite distant languages, such as Chinese, in the ECHP data.

[13] Based on a preliminary analysis using the Chiswick and Miller measure for eight of the countries in the ECHP, there is support for the hypothesis that the return to using English increases with the linguistic distance from English.

bedrooms, the number of beds, the number of arrivals of non-residents to hotels, the number of nights spent by non-residents to hotels, and the number of tourists.

For the purpose of this discussion, we will focus on the return to "any foreign language" usage. Positive and significant correlations between the return to such usage and several tourism measures were found (see appendix table A1).[14] There was no relationship found between the return to "any foreign language" usage and the overall trade measures, however.[15] Figures 1 through 4 show the relationships between the return to "any foreign language" usage and four variables with significant correlations: number of tourists, number of nights spent, number of bedrooms, and number of beds. The Netherlands, the UK, and Belgium have low returns and tend to have low values for the tourism variables in all of the figures. Luxembourg, Ireland, and Greece, on the other hand, have high values for both the returns and tourism. It appears, therefore, that there might be some relationship between the return to multiple language usage and trade (especially tourism) patterns across nations.

Summary and Conclusions

Using cross-sectional data from the ECHP for 1996 and pooled data for 1994-1999, we have estimated the return to using a second language in the workplace for samples of workers in 14 countries in Western Europe. Ordinary least squares estimates place the return between 5 and 20 percent of earnings, depending on the country. The language most widely rewarded across countries is English. The usage of other

[14] Given the small number of countries studied, the initial correlations were strongly influenced by the presence of Luxembourg. The results reported here refer to correlations calculated with Luxembourg excluded from the sample. Fewer variables showed significant correlations with the exclusion of Lux.
[15] Positive correlations were found for some particular languages, however: German, Spanish, and Other.

languages, including French, Italian and German, is rewarded in some countries, however. Only in the U.K. is there apparently no income return to using a second language on the job. Separate analyses by occupation and gender suggest there are some further variations in the return. The estimated return is much smaller and even insignificant in some countries when a fixed-effects specification of the model is used. Nonetheless, a positive return to using a second language on the job, in the 5 to 10 percent range, is found in about half of the countries studied.

One limitation of the present study is that the language usage variable is treated as exogenous, despite the fact that previous research has found support for the hypothesis that language skill acquisition and income are endogenously determined (e.g., Chiswick and Miller 1995).[16] As previously mentioned, however, there are not good instrumental variables for language usage in the ECHP data set. For example, previously used variables such as country or language of origin, or variables associated with country of origin, are not available in the ECHP except very broadly defined.

This problem might not be so important in the present context, however, for a couple of reasons. First, for many of the countries studied the acquisition of the second language skill is truly exogenous, as it is universally required. Second, the focus in this paper is on the language *usage*, which is less likely to be endogenously determined than is language *acquisition* or proficiency. Nonetheless, further research should attempt to find variables that might be used as instruments in a simultaneous equations model. Further research should also expand the analysis to other forms of returns, including a greater probability of employment or employment in more prestigious occupations.

[16] Henley and Jones (2005), however, find little support for endogeneity in their study of Wales.

The most important extensions of this work, however, will be in terms of further explaining the differential returns by language and by country. For example, further research should investigate the correlations between the estimated returns and national-level variables related to linguistic distance.

References

Carliner, G. Wage Differences By Language Group and The Market for Language Skills in Canada. *Journal of Human Resources*, XVI (1981), no. 3.

Cattaneo, A., and R. Winkelmann. Earnings Differentials between German and French Speakers in Switzerland. University of Zurich, Socioeconomics Institute, Working Paper no. 0309, November (2003).

Chiswick, B.R. Hebrew language usage: Determinants and effects on earnings among immigrants in Israel. *Journal of Population Economics* 11 (1998):253-271.

Chiswick, B.R. and P.W. Miller. The Endogeneity between Language and Earnings: International Analyses. *Journal of Labor Economics* 13 (1995), no,21.

_____. Language skills and earnings among legalized aliens. *Journal of Population Economics* 12 (1999): 63-89.

_____. Immigrant earnings: Language skills, linguistic concentrations and the business cycle. *Journal of Population Economics* 15 (2002).

_____. The complementarity of language and other human capital: immigrant earnings in Canada. *Economics of Education Review* 22 (2003).

_____. Linguistic Distance: A Quantitative Measure of the Distance between English and Other Languages, IZA DP No. 1246, August (2004).

Davila, A. and M.T. Mora. Hispanic ethnicity, English-skill, investments and earnings. *Industrial Relations*, Vol.40 (2001), No. 1.

Dustmann, C. and F. Fabbri. Language proficiency and labour market performance of immigrants in the U.K. *The Economic Journal* 113 (2003), July, 695-717.

Dustmann, C. and A.van Soest. Language Fluency and Earnings: Estimation with Misclassified Language Indicators. *The Review of Economics Statistics*, November (2001), 83(4).

_____. Language and the earnings of immigrants. *Industrial and Labor Relations Review*, Vol.55 (2002), No.3.

Fry, R. and B.L. Lowell, The Value of Bilingualism in the U.S. Labor Market, *Industrial and Labor Relations Review*, 57 (2003), October.

Grenier, G. Earnings by language group in Quebec in 1980 and emigration from Quebec between 1976 and 1981. *Canadian Journal of Economics*, November (1987).

Grin, F. and Vaillancourt, F. The Economics of Multilingualism: Overview and Analytical Framework, *Annual Review of Applied Linguistics* 17 (1997), 43-65.

Hayfron, J.E. Language training, language proficiency and earnings of immigrants in Norway. *Applied Economics* (2004).

Klein, C. La Valorisation des Competences Linguistiques sur le Marche du Travail Luxmbourgeois, CEPS/INSTEAD, Luxembourg, Cahier PSELL no. 139, November, (2003).

Koussoudji, S.A.. English Language Ability and the Labor Market Opportunities of Hispanic and East Asian Immigrant Men. *Journal of Labor Economics* vol.6 (1988), no.2.

Leslie, D. and J. Lindley. The impact of language ability on employment and earnings of Britain's ethnic communities. *Economica* 68 (2001), 587-606.

Lindley, J. The English Language Fluency and Earnings of Ethnic Minorities in Britain. *The Scottish Journal of Political Economy*, Vol. 49 (2002), No.4.

McManus, W.S., W. Gould and F. Welch. Earnings of Hispanic Men: The Role of English Language Proficiency. *Journal of Labor Economics*, vol.1 (1983), no.2.

McManus, W.S. Labor Market Costs of Language Disparity: An Interpretation of Hispanic Earnings Differences. *American Economic Review*, September (1985).

Peracchi, F. The European Community Household Panel: A Review. *Empirical Economics*, vol. 27 (2002), pp. 63-90.

Shapiro, D.M. and M. Stelcner. Male- Female earnings differentials and the role of language in Canada, Ontario, and Quebec, 1970. *Canadian Journal of Economics*, May (1981).

_____. Language and earnings in Quebec: Trends over twenty years, 1970-1990. *Canadian Public Policy*, Vol. XXIII (1997), No. 2.

Tucci, I. and G.G. Wagner. Fremdsprachenkenntnisse als wichtige Zusatzqualifikation Dienstleistungssektor. *Wochenbericht des DIV Berlin*, 41 (2003), 1.

Van Parijs, P. The Ground Floor of the World: On the Socio-Economic Consequences of Linguistic Globalisation, *International Political Science Review* 21 (2000), Spring.

APPENDIX

TABLE A1
Variable Definitions

Name	Description
LNY	Log of annual income from earnings
FLANG	1 if foreign language used at work, 0 otherwise
PROFMAN	1 if professional, managerial or technical occupation, 0 otherwise
CLERK	1 if clerk occupational category, 0 otherwise
BLUEC	1 if blue collar occupation, including laborers, 0 otherwise (other occupations excluded category)
AG	1 if employed in agriculture sector, 0 otherwise
IND	1 if employed in industrial sector, 0 otherwise (service sector excluded category)
ED2	1 if second stage of secondary level education, 0 otherwise
ED3	1 if third level education, 0 otherwise (less than second stage is excluded category)
MALE	1 if male, 0 otherwise
MSP	1 if married with spouse present, 0 otherwise
KIDS	number of children under age 16 in the household
AGE	age of respondent, in years
HRS	total hours worked per week (main + additional jobs)
FSIZE	number of employees in the firm (original codes)
BADHLTH	1 if general health is “very bad,” 0 otherwise
NATIVE	1 if citizenship is “national,” 0 otherwise

TABLE A2

Correlations between language return and trade measures

	Correlation between (Luxemburg excluded)*	Any Flang	English	French	German	Spanish	Italian	Dutch	Other
Trade indicators	Share of exports	0.065185258	-0.36457	-0.43953	0.127325	0.229354	-0.62816	-0.19238	0.279187
	Share of imports	0.039018223	-0.29272	-0.47851	0.181343	0.254363	-0.51798	-0.01034	0.255837
Capacity of collective accomodation	Number of establishments	0.075451223	-0.27843	-0.5219	0.180278	0.024563	-0.19971	0.119857	0.188626
	Number of bedrooms	0.277764584	0.220944	-0.18906	0.335764	-0.15306	0.16786	0.090543	0.231044
	Number of bed-places	0.302575714	0.181044	-0.24824	0.356027	-0.1309	0.149301	0.08714	0.171141
Occupancy of collective accomodation establishments	Arrivals of residents to hotels or similar	-0.19732688	-0.32208	-0.10387	-0.09404	-0.31364	-0.00815	-0.29788	-0.27295
	Arrivals of non-residents to hotels or similar	0.012397943	0.190294	-0.53934	0.719347	0.10423	0.092235	0.229093	0.032503
	Nights spent by residents in hotels and similar	-0.25551976	-0.40717	-0.23457	-0.00735	-0.24171	0.066428	-0.13634	-0.20262
	Nights spent by non residents in hotels and similar	0.303878749	0.046219	-0.4287	0.514689	-0.03682	0.048205	0.19437	0.081983
Tourism demand:domestic and outbound tourism	Number of tourists (x1000)	0.360763102	-0.5552	-0.35953	0.136963	-0.05039	-0.5341	-0.25684	0.137077
	Number of trips (x1000)	-0.40806599	-0.38262	0.002528	-0.4036	-0.03647	-0.43834	-0.32996	-0.02088
	Nights spent	-0.25655509	-0.55	-0.31852	-0.31905	0.083087	-0.83275	-0.1753	0.320562
	Tourism expenditures of residents	-0.25655509	-0.55	-0.31852	-0.31905	0.083087	-0.83275	-0.1753	0.320562

Table 1: Foreign Language Usage in 1996, by country

Percentage using second language in job

Language	Germany	Denmark	Netherlands	Belgium	Luxembourg	France	U K	Ireland	Italy	Greece	Spain	Portugal	Austria	Finland
Any	18.4	34.2	32.0	37.5	77.9	17.0	5.8	8.2	9.3	16.1	7.8	10.7	22.2	24.5
English	n/a	26.1	27.1	10.4	10.7	11.7			6.1	14.6	5.5	8.5	19.0	22.6
French	n/a	0.3	0.8	18.6	50.4		2.8	1.2	1.0	0.7	1.9	1.6	0.4	0.0
German		6.0	3.8	1.9	8.4	2.0	0.9	0.5	1.2	0.4	0.3	0.1		1.0
Spanish	n/a	0.0	0.1	0.1	0.3	0.7	0.5	0.0	0.1	0.0		0.3	0.1	0.0
Italian	n/a	0.0	0.0	0.3	1.6	0.6	0.1	0.0		0.3	0.1	0.0	0.3	0.0
Dutch	n/a	0.0		5.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0
Other	n/a	1.3	0.3	0.9	6.4	1.1	1.4	6.4	0.6	0.1	0.1	0.0	2.3	0.8
Sample Size	5394	3564	5334	3473	1082	7574	4429	4200	8073	4984	6489	5911	4038	6247

Source: ECHP, wave 3.

Table 2: Foreign Language Usage in 1996, by worker characteristic and country

Percentage using foreign language in job

Characteristic	Germany	Denmark	Netherlands	Belgium	Luxembourg	France	U K	Ireland	Italy	Greece	Spain	Portugal	Austria	Finland
Occupation														
profman	31.96	56.68	41.03	49.44	94.45	34.58	10.97	17.49	20.78	34.05	21.6	34.7	45.23	48.61
clerk	22.25	47.51	41.2	59.95	89.54	18.27	4.95	13.01	14.85	34.59	12.32	23.4	35.26	32.99
bluec	5.75	19.56	22.23	24.11	83.04	9.46	3.45	2.22	3.64	4.88	2.3	2.15	10.32	15.64
othocc	13.34	26.33	26.34	39.25	77.01	13.67	4.16	4.64	8.64	9.13	5.26	4.91	17.67	22.78
Industry														
ag	8.34	15.38	11.89	23.84	55.36	9.22	3.74	2.74	2.46	0.74	1.84	1.25	3.19	4.51
ind	18.9	31.35	30.24	46.23	91.27	19.69	5.37	3.54	9.42	11.37	7.63	6.36	20.49	29.09
serv	22.02	43.84	34.93	43.83	87.46	21.57	7.79	13.79	12.43	27.16	11.7	18.88	30.19	37.72
Education														
ed1	9.18	18.06	25.06	21.55	74.23	8.54	2.28	3.33	3.6	2.33	1.89	4.09	11.65	6.33
ed2	16.59	31.84	31	36.99	81.56	12.94	4.86	6.45	12.5	18.82	10.05	25.19	21.84	18.78
ed3	33.09	51.65	43.58	49.54	90.88	34.94	12.1	23.46	24.21	36.23	19.52	51.67	52.58	48.66
Gender														
male	21.15	37.6	37.02	41.74	82.58	18.57	6.73	7.62	10.01	14.61	7.99	10.46	22.32	25.31
female	14.76	30.25	24.9	31.61	70.98	14.98	5.15	9.28	8.15	19.25	7.49	11.14	21.92	23.7

Source: ECHP, wave 3.

Table 3: Regression Coefficients from OLS ln(income) equations, 1996

Coefficients on Foreign Language Variables

Variable	Germany		Denmark		Netherlands		Belgium	
	Coeff	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*
Any Flang	**0.1127**	**0.0278**	**0.1411**	**0.0265**	**0.0813**	**0.0212**	**0.0899**	**0.0328**
English		n.a.		**0.1623**	**0.0287**		**0.0907**	**0.0225**		**0.1146**	**0.0506**
French		n.a.		**0.4429**	**0.2059**		0.0137	0.1057		0.0481	0.0444
German		n.a.		0.0738	0.0456		0.0183	0.0492		**0.204**	**0.1026**
Spanish		n.a.		0.4624	0.4588		-0.06	0.3274		0.3822	0.3813
Italian		n.a.		-0.071	0.6485		-0.858	0.4639		-0.056	0.2127
Dutch		n.a.		0.0028	0.6477					**0.1575**	**0.057**
Other		n.a.		**0.2452**	**0.1051**		0.2885	0.1647		**0.2966**	**0.1361**
Sample Size	4622		2979	2979	4865	4865	2638	2638			
Adj. R-square	0.4186		0.3541	0.3553	0.572	0.5663	0.2227	0.2146			

Variable	Luxembourg		France		U K		Ireland	
	Coeff	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*
Any Flang	**0.259**	**0.0579**	**0.1044**	**0.022**	0.0504	0.0533	**0.1715**	**0.0435**
English		**0.3031**	**0.0791**		**0.1084**	**0.0262**						
French		**0.2784**	**0.0589**					0.1147	0.0736		-0.067	0.1089
German		**0.2917**	**0.0819**		**0.183**	**0.054**		0.0231	0.1332		0.1434	0.171
Spanish		0.4003	0.3992		**0.2766**	**0.0909**		0.1621	0.1893		0.142	0.4946
Italian		**0.2518**	**0.1466**		-0.012	0.1035		-0.123	0.4008		-0.796	0.4944
Dutch					0.033	0.3579		0.602	0.8007		-0.379	0.4947
Other		**0.18**	**0.0899**		-0.114	0.0778		-0.072	0.1053		**0.1824**	**0.0484**
Sample Size	953	953	5659	5659	3912	3912	3311	3311				
Adj. R-square	0.456	0.4546	0.3563	0.3445	0.4108	0.4074	0.3729	0.3771				

Table 3, continued

Variable	Italy		Greece		Spain		Portugal	
	Coeff	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*
Any Flang	**0.0776**	**0.0323**	**0.1962**	**0.0291**	**0.0898**	**0.0398**	**0.1628**	**0.0425**
English	**0.088**	**0.0414**	**0.2027**	**0.0303**	**0.0975**	**0.0465**	**0.1833**	**0.0464**
French	0.1324	0.082	**0.3208**	**0.1165**	0.1122	0.0768	**0.2317**	**0.1067**
German	0.066	0.082	0.1513	0.1452	0.2677	0.1947	0.0462	0.2623
Spanish	0.1357	0.2642	0.0054	0.6299			0.1888	0.1909
Italian	0.175	0.1383	0.0961	0.1638	0.4074	0.3884	**0.9615**	**0.4787**
Dutch							1.384	0.8265
Other	0.0389	0.1084	**0.7018**	**0.2577**	-0.165	0.2746	-0.945	0.8281
Sample Size	7004	7004	4148	4148	5355	5355	5196	5196
Adj. R-square	0.1877	0.1787	0.3045	0.3047	0.3018	0.3007	0.3364	0.3281

Variable	Austria		Finland	
	Coeff	*St. Err.*	*Coeff*	*St. Err.*
Any Flang	**0.1094**	**0.0323**	**0.1537**	**0.03**
English	**0.1435**	**0.0344**	**0.1656**	**0.0308**
French	-0.064	0.213	0.5058	0.4702
German			-0.026	0.1083
Spanish	0.2855	0.423		
Italian	0.0445	0.2043		
Dutch	0.5524	0.7312	-1.286	0.8147
Other	0.0361	0.0863	-0.161	0.1202
Sample Size	3501	3501	4602	4602
Adj. R-square	0.324	0.3166	0.3017	0.3044

Note: All regressions include controls for educational attainment, age, age squared, occupation, industry, marital status, hours worked, gender, number of children, firm size, health status, and nationality.

Bold coefficient indicates significance at 0.05 level.

Table 4: Returns to Language Usage, 1996, by occupation and gender

Coefficient on Flang variable, OLS regressions

Sample	Germany		Denmark		Netherlands		Belgium		Luxembourg		France		U K	
	Coeff	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*
By Occupations														
Prof/Man	**0.1233**	**0.0354**	**0.1717**	**0.0401**	**0.0866**	**0.0266**	**0.1163**	**0.0434**	**0.3698**	**0.1716**	**0.0783**	**0.0314**	0.0964	0.0656
Clerk	0.0758	0.0622	0.0144	0.0438	0.0543	0.0503	0.0896	0.0470	**0.3367**	**0.1322**	**0.1077**	**0.0450**	0.1982	0.1350
Blue Collar	0.1270	0.0728	0.0654	0.0543	**0.1022**	**0.0531**	0.0649	0.0784	0.0805	0.0680	**0.2017**	**0.0433**	0.0115	0.1317
Other	**0.3176**	**0.1021**	**0.2556**	**0.0804**	0.0785	0.0627	**0.3949**	**0.1453**	**0.3462**	**0.1347**	0.0795	0.0707	-0.2803	0.1948
By Gender														
Female	**0.1571**	**0.0490**	**0.1145**	**0.0342**	**0.1127**	**0.0358**	**0.1477**	**0.0555**	**0.3720**	**0.0916**	0.0445	0.0361	0.1014	0.0838
Male	**0.0944**	**0.0313**	**0.1609**	**0.0396**	**0.0635**	**0.0246**	0.0636	0.0400	0.0498	0.0735	**0.1479**	**0.0271**	0.0312	0.0666

Note: All regressions include controls for educational attainment, age, age squared, industry, marital status, hours worked, number of children, firm size, health status.

Sample	Ireland		Italy		Greece		Spain		Portugal		Austria		Finland	
	Coeff	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*	*Coeff*	*St. Err.*
By Occupations														
Prof/Man	0.1087	0.0578	0.0499	0.0450	**0.2072**	**0.0388**	0.0600	0.0525	**0.2873**	**0.0681**	**0.1595**	**0.0481**	**0.1692**	**0.0403**
Clerk	0.0287	0.0849	**0.1302**	**0.0344**	**0.1291**	**0.0451**	-0.0171	0.0790	0.0526	0.0712	0.0375	0.0713	**0.1706**	**0.0709**
Blue Collar	-0.0345	0.1398	**0.1718**	**0.0783**	**0.1700**	**0.0786**	0.1702	0.1051	0.0031	0.0939	0.0566	0.0600	0.0979	0.0777
Other	0.2167	0.1205	0.1223	0.1126	0.1599	0.0887	0.1362	0.1256	0.0834	0.1054	0.0678	0.0941	**0.1872**	**0.0800**
By Gender														
Female	**0.1553**	**0.0634**	-0.0100	0.0535	**0.1462**	**0.0529**	0.0884	0.0714	**0.1317**	**0.0661**	**0.1181**	**0.0518**	**0.1705**	**0.0415**
Male	0.1020	0.0585	**0.1265**	**0.0402**	**0.2126**	**0.0348**	**0.0946**	**0.0475**	**0.1857**	**0.0553**	**0.0942**	**0.0410**	**0.1216**	**0.0436**

Note: All regressions include controls for educational attainment, age, age squared, industry, marital status, hours worked, number of children, firm size, health status.

Bold coefficient indicates significance at 0.05 level.

Table 5: Fixed Effects estimates of return to language usage (pooled data)

Country	Flang Coefficient	St. Error	Sample N	Fixed Eff. F-test
Germany	0.008003	0.0509	4794	**5.03**
Denmark	**0.116591**	**0.0204**	3363	**5.64**
Netherlands	**0.043753**	**0.0101**	5602	**6.8**
Belgium	**-0.04088**	**0.0167**	3282	**6.6**
Luxembourg	**0.464998**	**0.1531**	919	**4.45**
France	0.019681	0.0556	4309	**4.92**
UK	-0.00209	0.0818	3800	**4.02**
Ireland	0.018962	0.0249	4653	**7.51**
Italy	0.024885	0.0223	7978	**4.59**
Greece	**0.03963**	**0.0175**	4976	**5.38**
Spain	0.001085	0.0224	6464	**4.79**
Portugal	-0.00908	0.0232	5649	**6.67**
Austria	**0.054752**	**0.0203**	3320	**5.21**
Finland	**0.055475**	**0.0192**	4486	**5.74**

Bold coefficient indicates significance at 0.05 level.

Figure 4: Number of tourists vs. return to any foreign languages

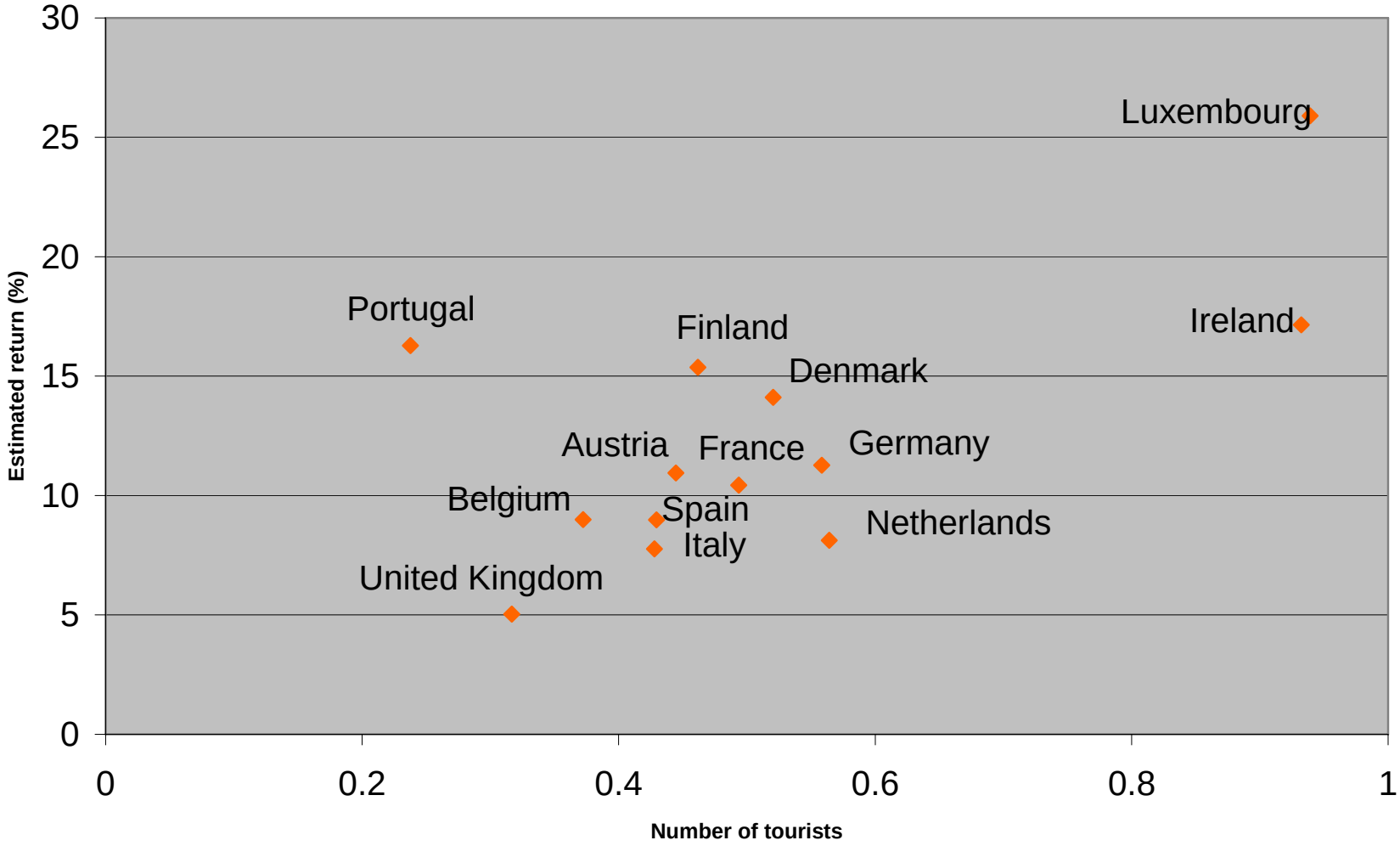

Figure 1: Number of bedrooms vs. return on any foreign language

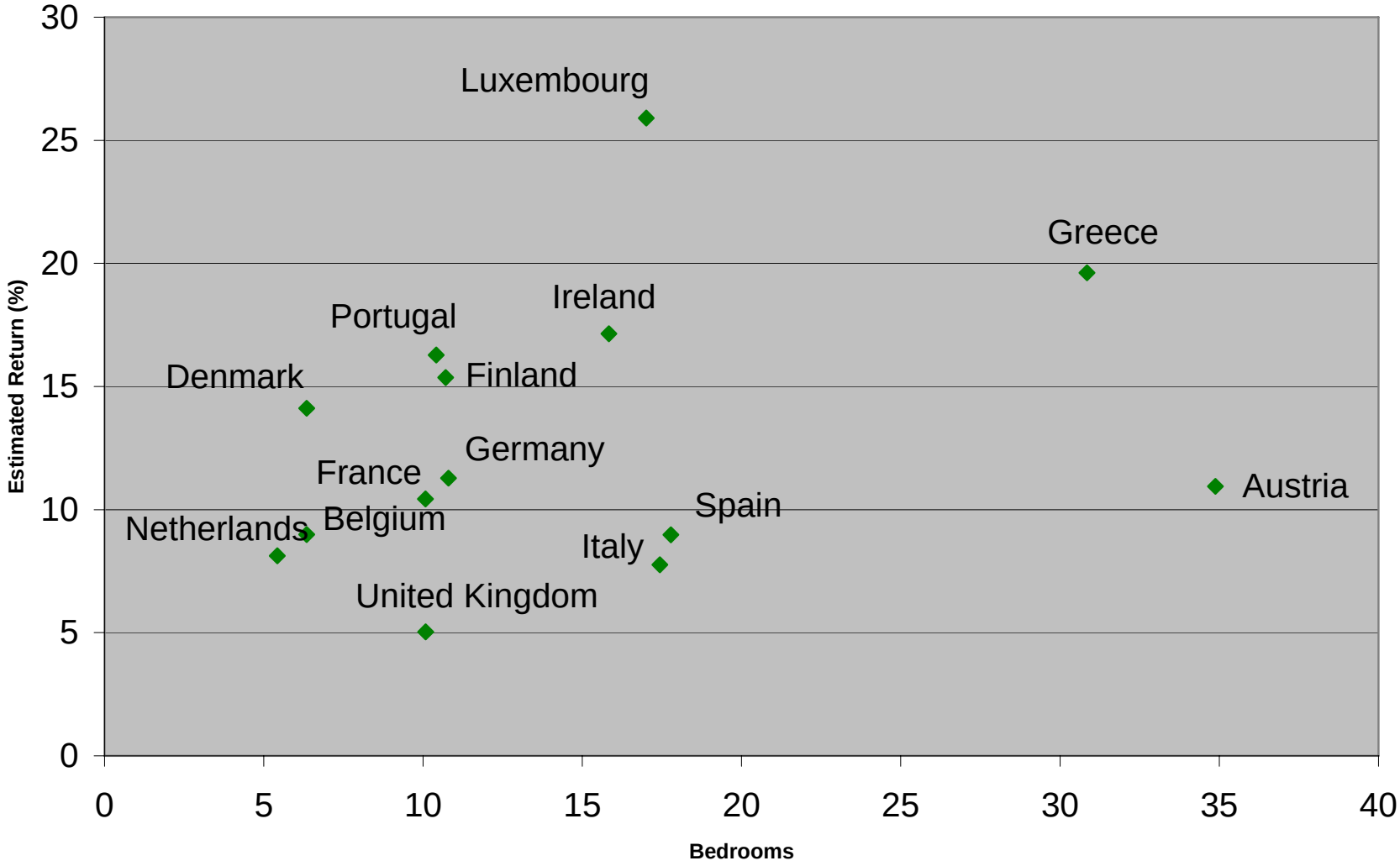

Figure 2: Number of bed-places vs. return on any foreign language

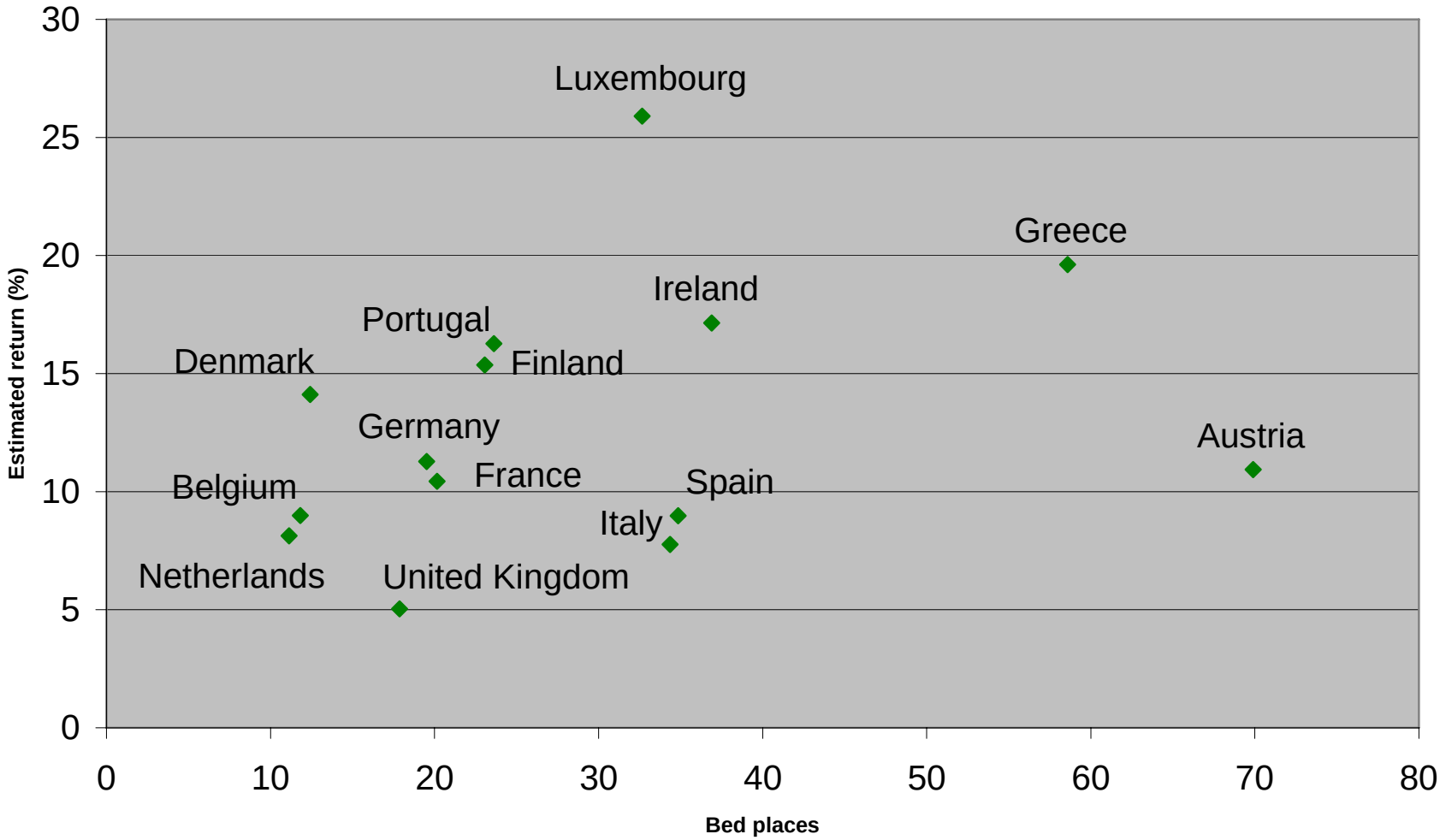

Figure 3: Nights spent by non-residents vs. return to any foreign language