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Multiple language usage and earnings in Western Europe

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Abstract

Purpose – The purpose of this paper is to estimate the return to multiple language usage in the workplace.

Design/methodology/approach – This article aims to estimate the effect that using an additional language at work has on earnings for a sample of workers in the European Community Household Panel survey. OLS and fixed-effects specifications of log-earnings regressions are estimated by country with controls for standard human capital, job, and personal characteristics.

Findings: – The results indicate that the use of a second language in the workplace raises earnings by 3 to 5 percent in several Western European nations, with even greater returns found in some. The estimated returns are found to be correlated with the extent of tourism in the country, but not other measures of trade.

Originality/value – This is the first paper to estimate returns to usage of an additional language in the workplace across the European Union, and contributes to our knowledge of the benefits of multi-lingualism.

Keywords Language usage, Human capital, Returns to education, Earnings, Languages, Western Europe

Paper type Research paper

Introduction

Language acquisition is a form of human capital development that has received a considerable amount of attention among labor 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, studies show that 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 USA 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, it reflects the belief that knowledge of a second language is an integral part of a well-rounded, liberal education. In any case, the acquisition of multi-linguistic skills is an investment in human capital that has the potential to increase the productivity of workers in the labor market.

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

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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. Some 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 *et al.* (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 USA (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 UK (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).

Again, the basic result from the above literature 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[2]. 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, however. 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[3]. Kalist (2005) examines the return to bilingualism within a single, narrowly defined occupation in the USA – 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

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

where y is the log of labor 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 and OLS and fixed-effects models. For the cross-sectional OLS specification, we estimate the parameters of

$$y_i = a + bS1_i + bS2_i + cA_i + dL_i + \boldsymbol{gX}_i + e_i,$$

where y, **Sn,** A, L, and **X** are as defined above and e_i is an individual-specific error term. For the fixed-effects specification, both individual and time fixed effects are estimated, for the following model:

$$y_{it} = a + bS1_{it} + bS2_{it} + cA_{it} + dL_{it} + \boldsymbol{gX}_{it} + v_i + u_t + e_{it},$$

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.

The data are from the European Community Household Panel (ECHP) survey[4]. The ECHP is a cross-national, longitudinal survey of the populations of 15 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, 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. Younger workers are excluded since many of them will have not completed their schooling, which may include language training. A balanced sample is used for the pooled regression analysis (individuals must be present in all years).

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[5]. 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 that provide information for Germany, the UK, and Luxembourg after 1996[6]. Consequently it is not available in the ECHP for those countries 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 descriptive statistics presented below[7].

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

Table I.
Foreign language usage in 1996, by country

Language	Percentage using second language in job													
	Germany	Denmark	Netherlands	Belgium	Luxembourg	France	UK	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	5,394	3,564	5,334	3,473	1,082	7,574	4,429	4,200	8,073	4,984	6,489	5,911	4038	6247

Source: Author's calculations, ECHP, wave 3

The interpretations of the data for the two multi-lingual countries, Belgium and Luxembourg, are somewhat complicated. In Belgium, for example, the most common language listed as the second language used is French, the official language in the Walloon region. Similarly a high proportion of the Belgians list Dutch as the second language used, the official language of Flanders. It is not possible to determine whether the respondent uses the language across international borders, or simply across regions. Given the country's close proximity to France, Luxembourg and The Netherlands, it is likely a combination of the two. 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, in reading technical sales reports, or in negotiating contracts. While interesting to know, these distinctions are not really critical to our analysis, however; a finding of a significant coefficient on the language variable would indicate a return to using the language, whichever the source.

Other variables that are used in the regression analyses are individual labor 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 AI).

Language usage results

Referring again to Table I, the language most commonly listed as the foreign language used is English in most countries[8]. 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 in Greece and Finland. French is the most common "second language" listed among workers in Belgium, Luxembourg, and the UK.

Table II presents the proportion that uses any second language, broken down by broad occupational category, business sector of employment, educational level, and gender[9]. 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.

Table II.
Foreign language usage in 1996, by worker characteristic and country

Characteristic	Percentage using foreign language in job													
	Germany	Denmark	Netherlands	Belgium	Luxembourg	France	UK	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: Author's calculations, ECHP, wave 3

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 variables. Earnings are measured by labor income. 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 III. 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 UK. 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[10].

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 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 IV 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 IV 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[11]. In France, Italy and Spain, on the other hand, the return is significant only for males. The differences in returns might result from gender

Variable	Coefficients on foreign language variables			
	Coeff	St. err.	Coeff	St. err.
Germany				
Any Flang	*0.1127**	*0.0278*		
English			n/a	n/a
French			n/a	n/a
German			n/a	n/a
Spanish			n/a	n/a
Italian			n/a	n/a
Dutch			n/a	n/a
Other			n/a	n/a
Sample size	*4,622*			
Adj. *R*-square	*0.4186*			
Denmark				
Any Flang	*0.1411**	*0.0265*		
English			*0.1623**	*0.0287*
French			*0.4429**	*0.2059*
German			0.0738	0.0456
Spanish			0.4624	0.4588
Italian			−0.071	0.6485
Dutch			0.0028	0.6477
Other			*0.2452**	*0.1051*
Sample size	2,979		2,979	
Adj. *R*-square	0.3541		0.3553	
The Netherlands				
Any Flang	*0.0813**	*0.0212*		
English			*0.0907**	*0.0225*
French			0.0137	0.1057
German			0.0183	0.0492
Spanish			−0.06	0.3274
Italian			−0.858	0.4639
Dutch				
Other			0.2885	0.1647
Sample size	4,865		4,865	
Adj. *R*-square	0.572		0.5663	
Belgium				
Any Flang	*0.0899**	*0.0328*		
English			*0.1146**	*0.0506*
French			0.0481	0.0444
German			*0.204**	*0.1026*
Spanish			0.3822	0.3813
Italian			−0.056	0.2127
Dutch			*0.1575**	*0.057*
Other			*0.2966**	*0.1361*
Sample size	2,638		2,638	
Adj. *R*-square	0.2227		0.2146	
Luxembourg				
Any Flang	*0.259**	*0.0579*		
English			*0.3031**	*0.0791*
French			*0.2784**	*0.0589*
German			*0.2917**	*0.0819*
Spanish			0.4003	0.3992
Italian			*0.2518**	*0.1466*
Dutch				
Other			*0.18**	*0.0899*
Sample size	953		953	
Adj. *R*-square	0.456		0.4546	

Table III.
Regression coefficients from OLS ln(income) equations, 1996

(*continued*)

Variable	Coefficients on foreign language variables Coeff	St. err.	Coeff	St. err.
France				
Any Flang	*0.1044**	*0.022*		
English			*0.1084**	*0.0262*
French				
German			*0.183**	*0.054*
Spanish			*0.2766**	*0.0909*
Italian			−0.012	0.1035
Dutch			0.033	0.3579
Other			−0.114	0.0778
Sample size	5,659		5,659	
Adj. *R*-square	0.3563		0.3445	
UK				
Any Flang	0.0504	0.0533		
English				
French			0.1147	0.0736
German			0.0231	0.1332
Spanish			0.1621	0.1893
Italian			−0.123	0.4008
Dutch			0.602	0.8007
Other			−0.072	0.1053
Sample size	3,912		3,912	
Adj. *R*-square	0.4108		0.4074	
Ireland				
Any Flang	*0.1715**	*0.0435*		
English				
French			−0.067	0.1089
German			0.1434	0.171
Spanish			0.142	0.4946
Italian			−0.796	0.4944
Dutch			−0.379	0.4947
Other			*0.1824**	*0.0484*
Sample size	3,311		3,311	
Adj. *R*-square	0.3729		0.3771	
Italy				
Any Flang	*0.0776**	*0.0323*		
English			*0.088**	*0.0414*
French			0.1324	0.082
German			0.066	0.082
Spanish			0.1357	0.2642
Italian			0.175	0.1383
Dutch				
Other			0.0389	0.1084
Sample size	7,004		7,004	
Adj. *R*-square	0.1877		0.1787	
Greece				
Any Flang	*0.1962**	*0.0291*		
English			*0.2027**	*0.0303*
French			*0.3208**	*0.1165*
German			0.1513	0.1452
Spanish			0.0054	0.6299
Italian			0.0961	0.1638
Dutch				
Other			*0.7018*	*0.2577*
Sample size	4,148		4,148	
Adj. *R*-square	0.3045		0.3047	

(*continued*)

Table III.

Variable	Coefficients on foreign language variables			
	Coeff	St. err.	Coeff	St. err.
Spain				
Any Flang	*0.0898**	*0.0398*		
English			*0.0975**	*0.0465*
French			0.1122	0.0768
German			0.2677	0.1947
Spanish				
Italian			0.4074	0.3884
Dutch				
Other			−0.165	0.2746
Sample size	5,355		5,355	
Adj. *R*-square	0.3018		0.3007	
Portugal				
Any Flang	*0.1628**	*0.0425*		
English			*0.1833**	*0.0464*
French			*0.2317**	*0.1067*
German			0.0462	0.2623
Spanish			0.1888	0.1909
Italian			*0.9615*	*0.4787*
Dutch			1.384	0.8265
Other			−0.945	0.8281
Sample size	5,196		5,196	
Adj. *R*-square	0.3364		0.3281	
Austria				
Any Flang	*0.1094**	*0.0323*		
English			*0.1435**	*0.0344*
French			−0.064	0.213
German				
Spanish			0.2855	0.423
Italian			0.0445	0.2043
Dutch			0.5524	0.7312
Other			0.0361	0.0863
Sample size	3501		3501	
Adj. *R*-square	0.324		0.3166	
Finland				
Any Flang	*0.1537**	*0.03*		
English			*0.1656**	*0.0308*
French			0.5058	0.4702
German			−0.026	0.1083
Spanish				
Italian				
Dutch			−1.286	0.8147
Other			−0.161	0.1202
Sample size	4,602		4,602	
Adj. *R*-square	0.3017		0.3044	

Notes: 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; Italic coefficient indicates significance at 0.05 level

Table III.

differences in the occupational distributions across the countries. Otherwise we have no explanation for these differential returns.

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

Sample	Coefficient on Flang variable, OLS regressions Coeff	St. err.
Germany		
By occupations		
Prof/Man	*0.1233*	*0.0354*
Clerk	0.0758	0.0622
Blue collar	0.1270	0.0728
Other	*0.3176*	*0.1021*
By gender		
Female	*0.1571*	*0.0490*
Male	*0.0944*	*0.0313*
Denmark		
By occupations		
Prof/Man	*0.1717*	*0.0401*
Clerk	0.0144	0.0438
Blue collar	0.0654	0.0543
Other	*0.2556*	*0.0804*
By gender		
Female	*0.1145*	*0.0342*
Male	*0.1609*	*0.0396*
The Netherlands		
By occupations		
Prof/Man	*0.0866*	*0.0266*
Clerk	0.0543	0.0503
Blue collar	*0.1022*	*0.0531*
Other	0.0785	0.0627
By gender		
Female	*0.1127*	*0.0358*
Male	*0.0635*	*0.0246*
Belgium		
By occupations		
Prof/Man	*0.1163*	*0.0434*
Clerk	0.0896	0.0470
Blue collar	0.0649	0.0784
Other	*0.3949*	*0.1453*
By gender		
Female	*0.1477*	*0.0555*
Male	0.0636	0.0400
Luxembourg		
By occupations		
Prof/Man	*0.3698*	*0.1716*
Clerk	*0.3367*	*0.1322*
Blue collar	0.0805	0.0680
Other	*0.3462*	*0.1347*
By gender		
Female	*0.3720*	*0.0916*
Male	0.0498	0.0735
France		
By occupations		
Prof/Man	*0.0783*	*0.0314*
Clerk	*0.1077*	*0.0450*
Blue collar	*0.2017*	*0.0433*
Other	0.0795	0.0707
By gender		
Female	0.0445	0.0361
Male	*0.1479*	*0.0271*

(*continued*)

Table IV.
Returns to language usage, 1996, by occupation and gender

Sample	Coefficient on Flang variable, OLS regressions Coeff	St. err.
UK		
By occupations		
Prof/Man	0.0964	0.0656
Clerk	0.1982	0.1350
Blue collar	0.0115	0.1317
Other	−0.2803	0.1948
By gender		
Female	0.1014	0.0838
Male	0.0312	0.0666
Ireland		
By occupations		
Prof/Man	0.1087	0.0578
Clerk	0.0287	0.0849
Blue collar	−0.0345	0.1398
Other	0.2167	0.1205
By gender		
Female	*0.1553*	*0.0634*
Male	0.1020	0.0585
Italy		
By occupations		
Prof/Man	0.0499	0.0450
Clerk	*0.1302*	*0.0344*
Blue collar	*0.1718*	*0.0783*
Other	0.1223	0.1126
By gender		
Female	−0.0100	0.0535
Male	*0.1265*	*0.0402*
Greece		
By occupations		
Prof/Man	*0.2072*	*0.0388*
Clerk	*0.1291*	*0.0451*
Blue collar	*0.1700*	*0.0786*
Other	0.1599	0.0887
By gender		
Female	*0.1462*	*0.0529*
Male	*0.2126*	*0.0348*
Spain		
By occupations		
Prof/Man	0.0600	0.0525
Clerk	−0.0171	0.0790
Blue collar	0.1702	0.1051
Other	0.1362	0.1256
By gender		
Female	0.0884	0.0714
Male	*0.0946*	*0.0475*
Portugal		
By occupations		
Prof/Man	*0.2873*	*0.0681*
Clerk	0.0526	0.0712
Blue collar	0.0031	0.0939
Other	0.0834	0.1054
By gender		
Female	*0.1317*	*0.0661*
Male	*0.1857*	*0.0553*

Table IV.

(*continued*)

Sample	Coefficient on Flang variable, OLS regressions Coeff	St. err.
Austria		
By occupations		
Prof/Man	*0.1595*	*0.0481*
Clerk	0.0375	0.0713
Blue collar	0.0566	0.0600
Other	0.0678	0.0941
By gender		
Female	*0.1181*	*0.0518*
Male	*0.0942*	*0.0410*
Finland		
By occupations		
Prof/Man	*0.1692*	*0.0403*
Clerk	*0.1706*	*0.0709*
Blue collar	0.0979	0.0777
Other	*0.1872*	*0.0800*
By gender		
Female	*0.1705*	*0.0415*
Male	*0.1216*	*0.0436*

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

Table IV.

Table V 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)[12]. Results from a Hausman specification test indicated that the fixed effects model is more appropriate than an alternative random effects model. The fixed effects specification requires that time-invariant explanatory variables, such as gender, are dropped from the analysis. 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.

Country	Flang Coefficient	St. error	Sample *N*	Fixed eff. *F*-test
Germany	0.008003	0.0509	4,794	*5.03*
Denmark	*0.116591**	*0.0204*	3,363	*5.64*
The Netherlands	*0.043753**	*0.0101*	5,602	*6.8*
Belgium	− *0.04088**	*0.0167*	3,282	*6.6*
Luxembourg	*0.464998*	*0.1531*	919	*4.45*
France	0.019681	0.0556	4,309	*4.92*
UK	− 0.00209	0.0818	3,800	*4.02*
Ireland	0.018962	0.0249	4,653	*7.51*
Italy	0.024885	0.0223	7,978	*4.59*
Greece	*0.03963**	*0.0175*	4,976	*5.38*
Spain	0.001085	0.0224	6,464	*4.79*
Portugal	− 0.00908	0.0232	5,649	*6.67*
Austria	*0.054752**	*0.0203*	3,320	*5.21*
Finland	*0.055475**	*0.0192*	4,486	*5.74*

Notes: Italic coefficient indicates significance at 0.05 level

Table V.
Fixed effects estimates of return to language usage (pooled data)

Referring to the coefficient estimates, positive and statistically significant returns to using a foreign language are 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 this model. We have no explanation for this result.

As seen by comparing the results in Table V and Table III, 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.

Trade and cross-national differences

What explanations might exist for the differential returns to foreign language usage across countries? Why is the return so much higher in Luxembourg than in Austria, for example? First, 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.

One possibility is the "linguistic 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[13]. 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[14].

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[15]. 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 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 the FLANG ("any foreign language" usage) variable as estimated in the OLS specification. Positive and significant cross-national correlations between the estimated return to such usage and several tourism measures were found (see Appendix, Table AII)[16]. There was no relationship found between the return to "any foreign language" usage and the *overall* trade measures, however[17]. Figures 1–4 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

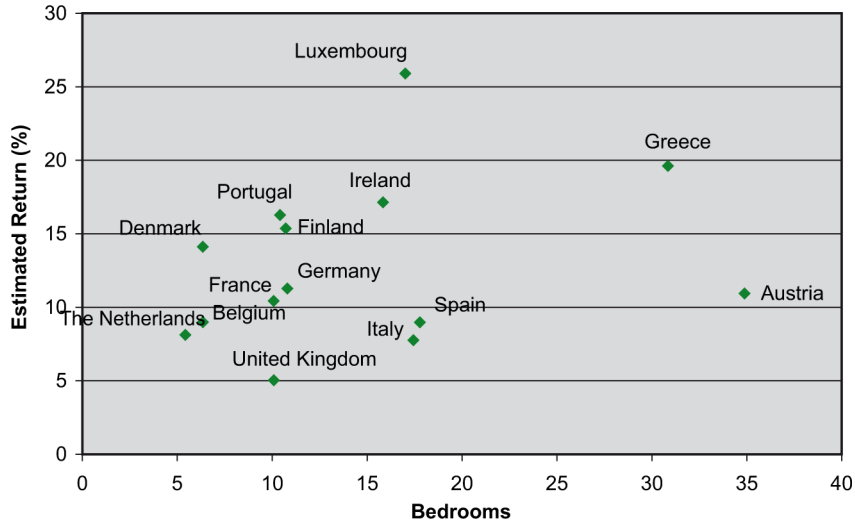

Figure 1.
Number of bedrooms vs return on any foreign language

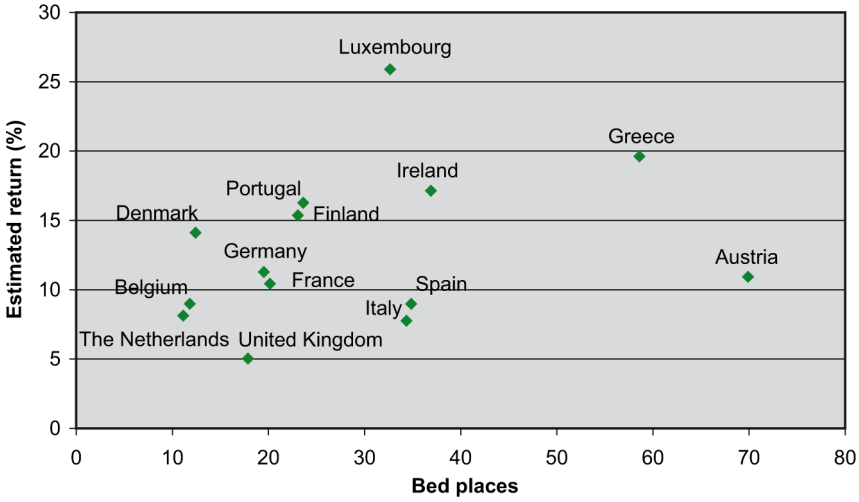

Figure 2.
Number of bed-places vs return on any foreign language

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 languages,

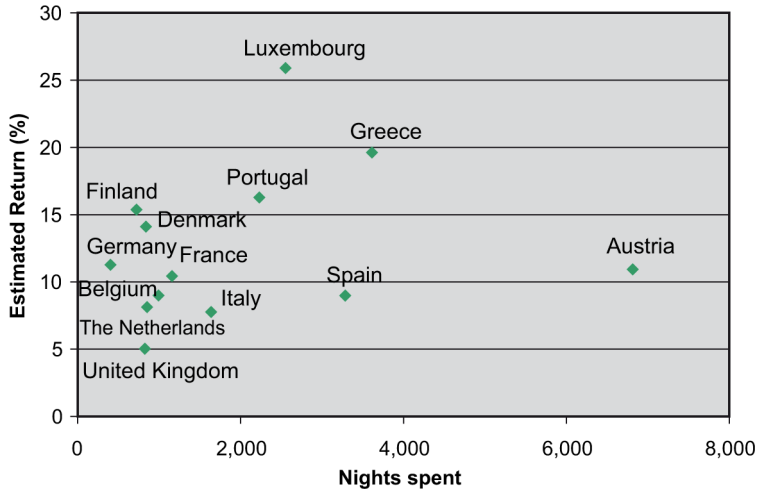

Figure 3.
Nights spent by non-residents vs return to any foreign language

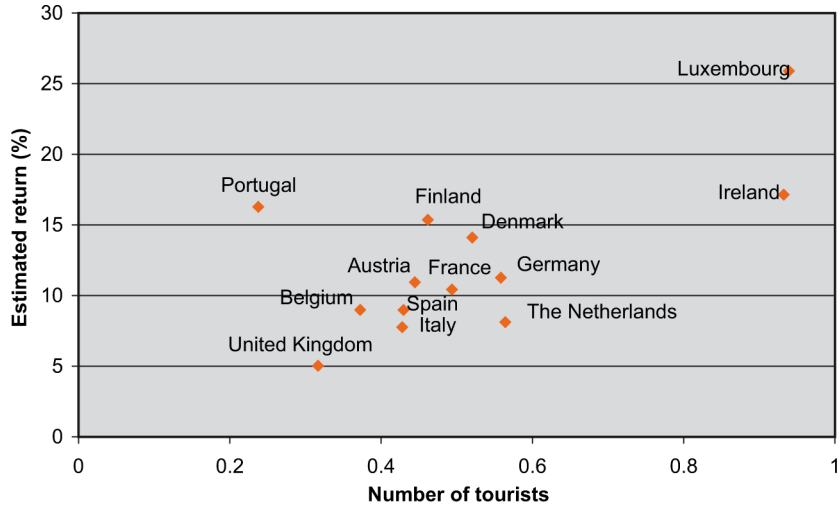

Figure 4.
Number of tourists vs return to any foreign languages

including French, Italian and German, is rewarded in some countries, however. Only in the UK 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 issue regarding the present study is that the language usage variable is treated as exogenous. Some previous research has found support for the hypothesis that language skill acquisition and income are endogenously determined (e.g. Chiswick and Miller, 1995)[18]. We do not think this problem is so important in the present context, however,

for two reasons. First, for many of the countries studied, the acquisition of the second language skill is truly exogenous, as it is universally required. Chiswick and Miller studied the case of immigrants who were choosing whether or not to learn the new language in their host country. Second, the focus in this paper is on language usage, which is less likely to be endogenously determined than is language acquisition or proficiency.

Nonetheless, further research might attempt to find variables that could be used as instruments in a simultaneous equations model. No such variables (e.g. country or language of origin, or variables associated with country of origin) are available in the ECHP. Further research could also expand the analysis to other forms of returns, including a greater probability of employment or employment in more prestigious occupations.

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

Notes

1. See Grin and Vaillancourt (1997) for an analysis of public policy toward multilingualism.
2. 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 USA after controlling for educational attainment. They also find no return among bilingual natives.
3. The Italian canton was excluded from the analysis.
4. See Peracchi (2002) for a description of the ECHP data.
5. We are familiar with one other paper that has used this variable. See Tucci and Wagner (2003).
6. These are the German Socioeconomic Panel, British Household Panel Survey, and Panel Survey on Employment and Living Conditions, respectively.
7. Data is available for Sweden starting only in 1997, so Sweden is excluded from the analysis.
8. We have not made use of the second or third languages listed.
9. For descriptive statistics on language usage at the EU level and using more detailed occupational categories, see Tucci and Wagner (2003).
10. Given the dummy variable in the logarithmic specification, the return is estimated as EXP(coefficient) – 1.
11. This result is consistent with that of Klein (2003) for Luxembourg.
12. As previously mentioned, only waves 1-3 are used for Belgium, Germany, Luxembourg and the UK, and waves 2-6 are used for Austria and Finland, due to data limitations.
13. Unfortunately there is no separate measure of usage of quite distant languages, such as Chinese, in the ECHP data.
14. 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.
15. An alternative, less direct measure would be the size of the country, reflecting the need of many small countries to engage in trade.
16. 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.

17. In a separate analysis for particular languages (German, Spanish and Other), however, positive correlations were found.

18. Henley and Jones (2005), however, find little evidence of endogeneity in their study of Wales.

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Appendix

Name	Description
LNY	Log of annual income from labor earnings (all jobs)
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 (1 = none, 2 = 1-4, 3 = 5-19, 4 = 20-49, 5 = 50-99, 6 = 100-499, 7 = 500 +)
BADHLTH	1 if general health is "very bad," 0 otherwise
NATIVE	1 if citizenship is "national," 0 otherwise
WAVE 2-6	Dummy variables for waves 2 thru 6

Table AI.
Variable definitions

Table AII.
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 accommodation								
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 accommodation 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 (× 1000)	0.360763102	−0.5552	−0.35953	0.136963	−0.05039	−0.5341	−0.25684	0.137077
Number of trips (× 1000)	−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

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