

Effects of Multiple Language Usage in Western Europe

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This paper studies the effect that using multiple languages at work has on a person's income, in Luxembourg and in other nations in Western Europe.

Using data from the European Community Household Panel Survey, we first examine the degree of multiple language usage in 14 nations.

We then study the relationship between multiple language usage and the earnings of people in the sample, controlling for other factors that affect earnings such as human capital, job, and personal characteristics.

Finally, we examine some of the determinants of cross-national variations in the returns to multiple language usage, including the extent of tourism in the country. The results suggest large and significant returns to multiple language usage in many nations.

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.

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 (as in Luxembourg), and the demands it creates on its citizenry. In other cases, however, it reflects the belief that knowledge of a second (or third) language is an integral part of a well-rounded 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 labour 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 labour 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.

Since the investment in acquiring this form of human capital comes at some cost, it is important that we understand the returns to it. This research 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, including Luxembourg. The research differs from previous work in that it considers several countries, providing the opportunity for cross-national comparisons of the results.

Previous Research¹

As previously noted, most of the previous research in this area focuses on the role that language plays in the economic success and/or assimilation of immigrants. The basic result, that language deficiency among immigrants is a determinant of their lower earnings, has been found to be true for several immigrant groups and for a variety of countries.

Regarding the returns to language skills among natives of a country, recent work has found a similar, positive, effect. In Canada, for example, Francophones who also speak English have been found to have higher earnings than those who do not. In Switzerland, returns to bi-lingualism

have been found for native French speaking workers who are working in a German-speaking region and vice-versa. In the U.S., a positive return to learning Spanish has been found among a sample of registered nurses who work in regions where Spanish is widely-spoken.

The effect of foreign language usage in Luxembourg has been studied previously by Klein (2003). He found that there is a positive and significant return to knowledge of English in the Luxembourg labour market. The question addressed in the current research is, is there a return to using a foreign language in one's work in other nations in Western Europe?

Recent research has found that foreign language skills increase earnings in several countries, including Luxembourg

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 measure the level of competency in this analysis, however, but rather only whether the individual uses a second language (or more) in his or her work.

The data is from the European Community Household Panel (ECHP) survey². 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 of the years, 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. Given data limitations, we focus on the returns to language usage in 1996.

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. The variables used in this analysis are a simple indicator of whether any other language is used at work (FLANG), and then variables which identify the first language listed among those used. Note that in a country with multiple official languages, such as Luxembourg, only one of them is used as the basic reference point. This can vary with the region of the country, as in Belgium.

The underlying model is one in which individuals' incomes differ according to their investments in "human capital." One form of investment is the acquisition of foreign language skills

¹ See Williams (2006) for a complete review of this literature.

² See Peracchi (2002) for a description of the ECHP data.

Language Usage Results

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.

The language most commonly listed as the foreign language used in most countries is English³. French is the most common "other language" listed among workers in Belgium, Luxembourg, and the U.K. (with the "official" language being Dutch, Luxembourgish, and English, respectively).

The use of foreign languages at work varies considerably across countries. The most commonly used foreign language is English

T₁ Foreign Language Usage in 1996, by Country

Language	Percentage using Second Language in Job													
	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

³ We have not made use of the second or third languages listed.

Returns to Language Usage

In order to estimate the returns to the use of a second language on the job, we use multiple regression analysis to estimate the percentage increase in income that arises from use of the “foreign” language. This is done separately by country, and controlling for the effects of other variables that affect earnings, including 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. Definitions for each of the variables used are presented in Williams (2006). 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 of this analysis are presented in Table 2. The first two columns for each country give the estimated return to any foreign language usage (Any Flang), and its standard error. The second two columns give the returns according to

the 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 highest return is found in Luxembourg, where use of a second language is associated with nearly 30 percent higher earnings⁴.

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. But in many countries we find significant returns to using other languages as well. A substantial return to using French, for example, is found in Denmark, 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.

The highest return is found in Luxembourg, where use of a second language increases earnings by nearly 30 percent

T₂ Regression Coefficients from OLS ln(income) equations, 1996

Variable	Coefficients on Foreign Language Variables															
	Germany				Denmark				Netherlands				Belgium			
	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>
Any Flang	0.1127	0.0278			0.1411	0.0265			0.0813	0.0212			0.0899	0.0328		
English			n.a.	n.a.			0.1623	0.0287			0.0907	0.0225			0.1146	0.0506
French			n.a.	n.a.			0.4429	0.2059			0.0137	0.1057			0.0481	0.0444
German			n.a.	n.a.			0.0738	0.0456			0.0183	0.0492			0.204	0.1026
Spanish			n.a.	n.a.			0.4624	0.4588			-0.06	0.3274			0.3822	0.3813
Italian			n.a.	n.a.			-0.071	0.6485			-0.858	0.4639			-0.056	0.2127
Dutch			n.a.	n.a.			0.0028	0.6477							0.1575	0.057
Other			n.a.	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	

⁴ The return is estimated as $EXP(\text{coefficient}) - 1$.

	Coefficients on Foreign Language Variables																	
Variable	Luxemburg				France				U.K				Ireland					
	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>		
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			
Italy				Greece				Spain				Portugal						
	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>		
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			
Austria				Finland														
	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>	<i>Coeff</i>	<i>St. Err.</i>										
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											

Source: Williams (2006)

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.

Cross-national Differences

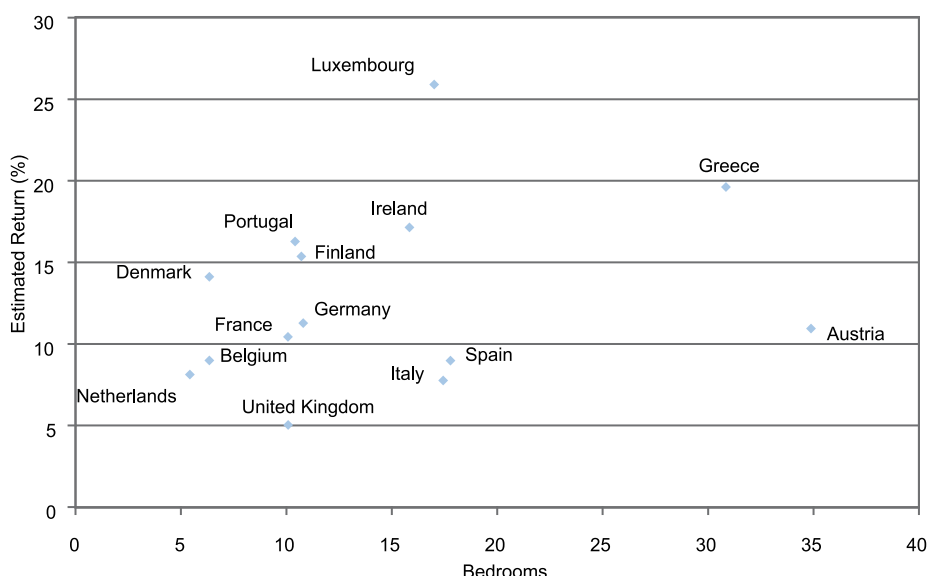
What explanations might exist for the differential returns to foreign language usage across countries? One possibility relates to patterns of international trade. We would expect workers in countries in which there is a high proportion of international trade to receive higher returns to learning (and 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 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 “any foreign language” usage. Positive and significant correlations between the return to such usage and several tourism measures were found (see Williams 2006). There was no relationship found between the return to “any foreign language” usage and the overall trade measures, however. 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 a positive relationship between the return to multiple language usage and trade (especially tourism) patterns across nations.

Another 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

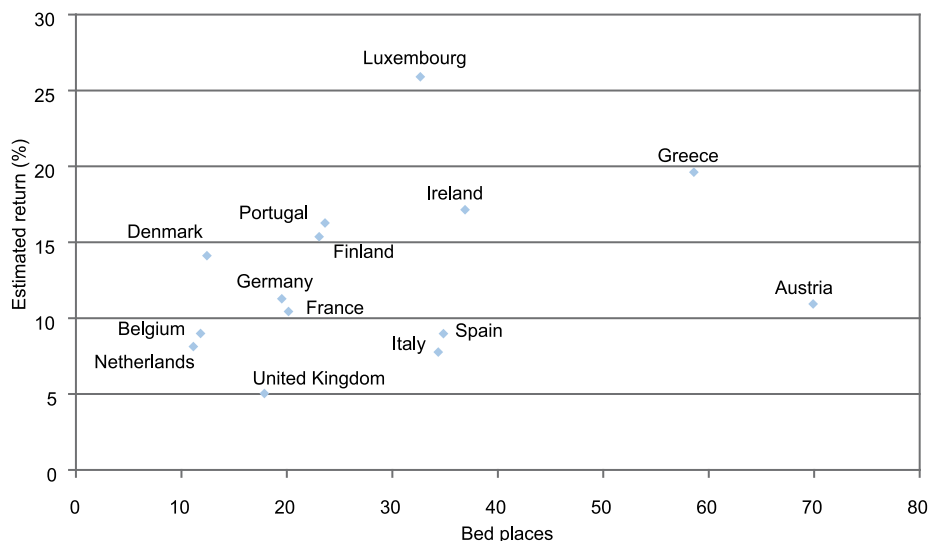
expect, therefore, the return to using English to be higher in Spain and Italy than the return to using French. Alternatively, we might expect the return to using English to be higher in Spain and Italy than it is in Germany. This is a topic that should be explored in further research.

F₁ Number of Bedrooms vs. Return on any Foreign Language



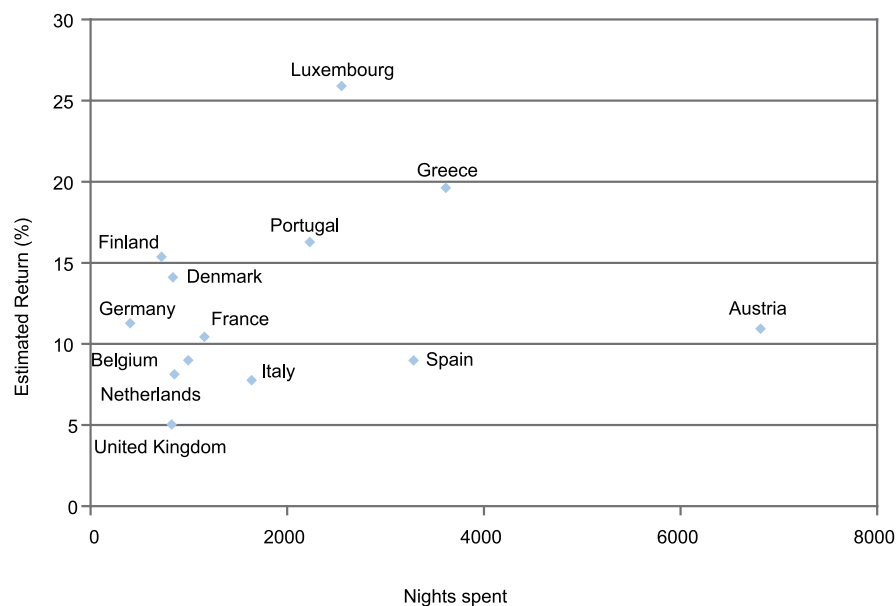
Source: Williams (2006)

F₂ Number of Bed-places vs. Return to any Foreign Languages



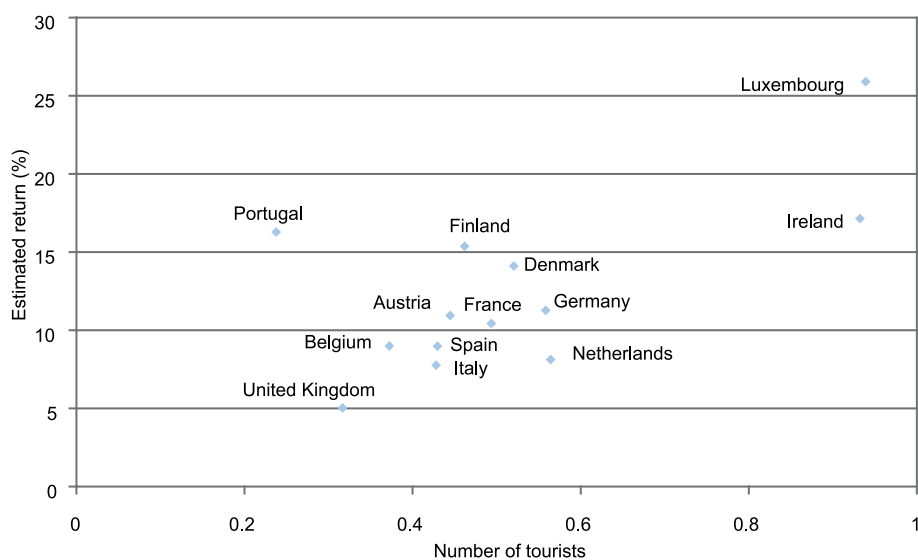
Source: Williams (2006)

F3 Nights spent by Non-residents vs. Return to any Foreign Languages



Source: Williams (2006)

F4 Number of Tourists vs. Return to any Foreign Languages



Source: Williams (2006)

Conclusion

Foreign language skill is an important human capital characteristic that is rewarded in the labour market across nations. Educational policy

makers should be aware of this fact as they prepare workers for an ever more global economy.

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