Foreign Direct Investment, Trade, and Cross-Border Migration as Drivers of Foreign Language Education

by

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Abstract

The cognitive and economic benefits of learning a foreign language as well as the impacts of common languages on FDI, trade, and migration have been well-researched. However, there is not much literature on whether FDI, trade, and migration influence students' decisions to study a particular foreign language. This paper uses data from the Euro-zone to measure the relationships between students studying modern foreign languages and FDI, imports, and migration across 6 country pairs. I run country-pair regressions to study the relationships, and we determine that in some countries, FDI and imports are correlated to students enrolled in foreign languages, but there is no consistent pattern across all six country pairs. I then explain the inconsistencies in the country-pair relationships through cultural aspects, the stickiness of language learning, and the dominance of English. Next, I examine how the study of English, as a lingua franca for business, behaves differently from the study of other foreign languages. Finally, I run a panel data analysis on the countries studied and conclude that while economic indicators are still a consideration for students learning non-English foreign languages, it is not the primary reason for language learning. Overall, students will tend to invest in English for business and learn other foreign languages for secondary cultural reasons.

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1. Introduction

Your mother probably made you take a foreign language while you were in school. Otherwise, your school district or college entrance or graduation requirements necessitated that you take a foreign language. The cognitive and economic benefits of learning a foreign language have been well-researched, but what factors lead people to decide which languages to learn? This paper seeks to measure whether certain economic flows, including foreign direct investment, trade, and cross-border migration, may influence people's decisions to choose to study a certain foreign language. Given the limited data availability on language education around the world, it focuses on four major non-English-speaking economies of the European Union: Germany, France, Spain, and Italy. I hypothesize that increased flows of FDI, trade, and migration between countries will lead to greater enrollment rates for those specific foreign languages within those countries.

1.2 Reasons for Foreign Language Education

Why do people study foreign languages? Studies have shown that learning foreign languages produces cognitive and economic benefits. In the paper, "The Foreign Language Effect: Thinking in a Foreign Tongue Reduces Decision Biases," Boaz Keysar and graduate students Sayuri Hayakawa and Sun Gyu An found that thinking in a non-native language reduces loss aversion and may lead to more rational decision-making[1]. Studying foreign languages has also been proven to have economic benefits, both for individuals and for institutions. Using the

[1] Keysar, et al. (2012): "The Foreign Language Effect: Thinking in a Foreign Tongue Reduces Decision Biases," Psychological Science 23.6 (2012): 661-668. Web.

Baccalaureate and Beyond Longitudinal Study (B&B), researchers Saiz and Zoido concluded in 2002 that learning a second language increases an individual's hourly wages by 2%[2].

1.3 The Relationship between Language, Trade, FDI, and Migration

There is a vast amount of economic literature on how knowing or acquiring a foreign language shapes factors like FDI, trade, and migration. The empirical evidence suggests that shared languages between countries increase all three factors. Researchers Oh, et. al. confirmed that speaking a common language increases both trade and FDI, but is more important in FDI than in trade. The paper also suggests that common languages lower transaction costs, and the proposed hierarchy of transaction costs related to major languages ranked English as the lowest, followed by French, Spanish, and Arabic[3].

Not surprisingly, language has been shown to have a significant positive effect on trade. Countries that share the same official language trade significantly more with each other; see e.g. Egger and Lassmann, 2012.

In terms of migration, fluency in a destination country's language helps immigrants succeed in the destination country's labor market, see e.g. Kossoudji (1988), Bleakley and Chin (2004), Chiswick and Miller (2002, 2007), Dustmann (1994), Dustman and van Soest (2002), and Dustman and Fabbri (2003). Bleakley and Chin (2004 and 2010) found that language skills are key for immigrants in terms of successful education, earnings, and social outcomes. By studying linguistic distances and the roles of widely spoken languages across OECD countries from 1985-2006, Adsera and Pytlikova found that emigration rates were higher among countries

[2] Saiz, Albert and Elena Zoido (2002): "The Returns to Speaking a Second Language," Federal Reserve Bank of Philadelphia Working Paper No. 02-16.
[3] Oh, Chang Hoon, W. Travis Selmier, and Donald Lien. "International Trade, Foreign Direct Investment, and Transaction Costs in Languages." The Journal of Socio-Economics 40.6 (2011): 732-35. Web.

whose languages are more similar, suggesting that common languages drive decisions for migration[4]. Specifically, researchers found that within the European Union, speaking the language a language of another EU country increases the likelihood of migrating to that country by five times[5].

While there have been many studies to show how languages affect FDI, trade, and migration, there has been very little literature, to my knowledge, that studies how these economic indicators affect people's decisions to learn foreign languages. This paper attempts to determine whether changes in economic flows in major European countries influence enrollments in foreign language studies in of those countries. The paper focuses on four major economies in the European Union: Germany, France, Spain, and Italy. I hypothesize that increased flows of FDI, trade, and migration between countries will lead to greater enrollment rates within those countries for those specific foreign languages.

2. Methodology and Data Availability

2.1 Focus on the European Union

Given the scarcity of foreign language education data around the world, this paper focuses on the Euro-zone because of the availability of data, the role of the EU, and the importance of language education in Europe.

First, data in Europe, although somewhat limited, is more readily available than in other regions of the world. Eurostat's main focus is to "process and publish comparable statistical

[4] Adsera, Alicia and Mariola Pytlikova (2012): "The Role of Language in Shaping International Migration," IZA Discussion Paper No. 6333. Web.
[5] Fenoll, Ainhoa Aparicio and Zoe Kuehn (2014): "Does Foreign Language Proficiency Foster Migration of Young Individuals within the European Union?" IZA Discussion Paper No. 8250. Web.

information at the European level[6]," which makes it easier to run the cross-country analyses that are attempted in this paper.

Second, the single monetary union, economic system, and lack of border controls enable goods, services, money, and people to move freely. Given that this paper seeks to examine how the choice to study languages is affected by economic flows between countries, it makes sense to choose a region where FDI, trade, and migration flows are relatively unrestricted among all countries studied.

Third, Europe in particular stresses the importance of foreign language education. The European Commission Commissioner for Education, Culture, Multilingualism and Youth, Androulla Vassiliou commented, "Linguistic and Cultural Diversity is one of the European Union's major assets," and the European Commission seeks to foster language learning to "open up opportunities for young people to study and work abroad and open up new markets for EU businesses competing at the global level."[7]

The countries studied in this paper are the largest member states in the EU in terms of GDP (with the exception of the United Kingdom). This paper excludes the UK for two reasons. First, English is the "lingua franca" of the region and such a universally important language that it may have an overshadowing effect, and second, the UK does not report data to Eurostat in terms of pupils learning foreign languages.

2.2 Language Data

[6] European Commission. "Your Key to European Statistics." What We Do. European Commission, n.d. Web. 21 Apr. 2015.

[7] European Commission. Children in Europe Start Learning Foreign Languages at an Increasingly Early Age. *Europa.eu.* N.p., 20 Sept. 2012. Web. 5 Mar. 2015.

The language data used in this paper come from Eurostat, which has information on the total number of students in ISCED 1997 levels 1-3 by modern foreign language studied from 1998 to 2012. ISCED stands for the International Standard Classification of Education, which was designed by UNESCO in the early 1970s to standardize education statistics. The present classification is ISCED 1997, which was approved by the UNESCO General Conference at its 29th session in November 1997. Level 1 is primary education, the first stage of basic education and the start of compulsory education. Level 2 is lower secondary education, usually between 6-9 years after primary education, and also signifies the end of compulsory education. Level 3 is upper secondary education, which typically has an entrance qualification and a minimum entrance requirement[8]. Unfortunately, the dataset is not complete, and there are many missing data points. For example, France does not report the number of ISCED 1 pupils learning foreign languages between 2001 and 2010. Given the low data availability, this paper attempts to measure relationships across the most available and reliable datasets and focuses on students in ISCED levels 2-3.

2.3 FDI Data

Foreign Direct Investment (FDI) data from 1998-2012 was also extracted from Eurostat, measured by FDI flows cross-border and new investments made during the period by residents in the reporting entity in affiliated enterprises abroad. The unit used is thousands of Euro/ECU.[9]

2.4 Trade Data

Import data is extracted from the United Nations Commodity Trade Statistics Database (UN Comtrade) in terms of value in total USD. Comtrade measures bilateral trade by reporting

[8] "International Classification of Education ISCED 1997." *UNESCO.* Nov. 1997. Web. 15 Apr. 2015.
[9] "European Union Direct Investments." *Eurostat Metadata.* 16 Dec. 2013. Web. 15 Feb. 2015.

each country's imports by trading partner. I did not convert the data to euros because I did not want to compromise the integrity of the data. This paper also seeks to measure only the general relationship between the economic indicators and language enrollments and not the exact magnitudes of that relationship, so it was unnecessary to convert the units to euros at this time.

2.5 Migration Data

To my surprise, reliable migration data between the four countries studied were surprisingly difficult to find. Here, I use two main sources of migration data. The first comes from Eurostat, which measures foreign-born population of each country. For each country pair, I looked at the number of people in the population that were born in the partner country. For example, to examine the relationship between France and Spain, I examined French students studying Spanish and the population of Spanish-born French residents. Another source of migration data came from total immigration data found in the International Migration Database collected by the United Nations Department of Economic and Social Affairs. This database reports immigrants by their country of origin and destination, and is updated as of 2010. However, this database provides no data for 2010-2012, and many data points are missing or limited in the database. As a result of the limited data availability on migration, I was only able to run regressions for a subset of country pairs to measure the relationship between migration and language studies.

2.6 Control Variables

Because the data referenced total number of students studying a certain language, it was important to control for the total number of students enrolled in ISCED levels 1-3 by country because changes in the total number of students is likely to affect the numbers of students

studying a particular subject. Eurostat also provides these data for the relevant time period (1998-2012). Other control variables include GDP per capita in nominal terms (in Euros per inhabitant) found on Eurostat. The intuition behind controlling for GDP per capita is that if one country is perceived to be "wealthier," students may have more of an incentive to study the language of that country in hopes of better economic and business opportunities. Finally, to control for migration data, I used total population of each of the countries in the set calculated at mid-year, based on data from the World Bank.

3. Model

The model uses least-squares regressions on each of the following six country pairs: France-Spain, France-Italy, France-Germany, Spain-Italy, Spain-Germany, and Italy-Germany. Each country that reports data is titled the "reporting country" or "home country," and the other country in the pair is titled the "partner country." For each of the country pairs, I run the regression for the number of students in the home country studying the language of the partner country against FDI flows from each country to the other, imports by each partner country from the other, and (if available) migration data. I run the regressions separately for ISCED 2 and ISCED 3. Then, I run the regression again with various controls, including total students enrolled in the corresponding ISCED level and GDP per capita. If migration data are used, I control for total population.

4. Findings

4.1 Language Learning in ISCED 2 without Migration Data

Because the metrics and data for migration were not consistent for the 4 countries studied, I chose not to include them in my first set of regressions. I will address migration for a

subset of country pairs later in the paper. Meanwhile, for FDI and imports, there are no consistent patterns between the six country pairs showing correlation between either of the indicators and the number of students studying the partner country's language. It seems that for certain countries, economic flows are a more important consideration in determining which languages students choose to study than for others.

4.1.1 France-Spain Example

Table 1: Least Squares Regression Predicting Number of French Students Studying Spanish (ISCED 2) on FDI and Trade Flows Between France and Spain

Variable	(1) French Students Studying Spanish	(2) French Students Studying Spanish	(3) French Students Studying Spanish
Imports (France to Spain)	1.24E-05** (3.77)	1.23E-05** (3.71)	-1.15E-05** (-3.74)
Imports (Spain to France)	-5.71E-06 (-1.48)	-6.56E-06 (-1.64)	6.72E-06* (2.74)
FDI (France to Spain)	-0.001890 (-0.49)	-0.001502 (-0.39)	-0.003415* (-2.51)
FDI (Spain to France)	0.006740^ (1.96)	0.008936^ (2.13)	0.002958^ (2.01)
Total French Students in ISCED 2		-0.416811 (-0.92)	0.039391 (0.239)
France GDP per capita			56.78693** (4.79)
Spain GDP per capita			-9.372842 (-1.07)
Observations	15	15	15

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

The above table shows 3 models for predicting the number of French Students Studying Spanish using FDI and import flows between the countries.

In the first model, I run the regression with French students studying Spanish, with no controls. My results show that imports from France to Spain are positively correlated with

language learning, and is significant at the 1% level. FDI from Spain to France appear to be positively correlated as well, but was only significant at the 10% level.

In the second model, I control for total French students in ISCED 2 because the number of French students studying Spanish is most likely correlated with the total number of French students enrolled in ISCED 2. Contrary to my intuition however, the model shows that the number of French students studying Spanish is not significantly correlated to the number of total French students in ISCED 2. The rest of the results are similar for the first and second models. Imports from France to Spain are positively correlated and significant at the 1% level, and FDI from France to Spain is positively correlated and significant at the 10% level.

Because the decision to learn languages may also be correlated to the perceived wealth of a country—i.e. people will want to learn the languages of a "wealthier" country—I then ran the a model that also controls for the GDP per capita of each country. After adding all controls, I found that FDI from Spain to France is positively correlated with language learning at the 10% level, and imports from Spain to France at the 5% level. Surprisingly, French GDP per capita is also positively correlated and significant at the 1% level, and imports and FDI from France to Spain are negatively correlated and significant.

The regressions suggest for French students, the decision to learn Spanish may be related to the FDI and trade flow relationships between the two countries. It would appear that the direction of flows do matter – imports and FDI from Spain to France are both positive and significant, whereas imports and FDI from France to Spain are negative and significant. Greater economic flows from Spain to France seem to lead to increasing numbers of French students studying Spanish. Counterintuitively, it seems that while increasing imports and FDI from Spain

to France correlated with more French students studying Spanish, increasing flows in the opposite direction, from France to Spain, was negatively correlated with the number of French students studying Spanish. It is possible that French students choose to study Spanish because they are affected by Spain's economic influence on their country, whereas their home country's economic influence on Spain would decrease the likelihood of them learning the partner country's language.

Next, I tested to see if the correlation between language learning and FDI and imports would hold:

1. In the opposite direction, e.g. for Spanish students learning French,
2. For other country pairs (France-Italy, France-Germany, Spain-Germany, Spain-Italy, and Italy-Germany), in both directions, and
3. For each country pair, given ISCED 3 (upper-secondary education)

The remaining regression tables can be referenced in the Appendix.

After running the regressions, it seems that trade and FDI do matter for some country pairs, but the result is not consistent across the board. For example, for Spanish students learning French, it appears that language learning is only correlated to the total number of Spanish students in ISCED 2, and not correlated with trade or FDI.

4.1.2 A Special Note about Spain

For Spanish students in ISCED 2, the choice to study any foreign language (French, German and Italian) seems to be significantly correlated with the number of Spanish students enrolled in the ISCED level. This suggests that the key factor driving the changes in Spanish

students' foreign language study is simply the changes in the numbers of students. I then ran the regression for ISCED 3, and with the exception for the Spain-Italy pair, the results seem to hold that the total number of students is a significant factor in explaining Spanish students' foreign language choices.

This does not appear to hold for the other countries. I speculate that one reason for this phenomenon is Spain's relative cultural unwillingness to emphasize foreign language studies compared to the other countries in the study. In 2010, a statistical analysis of foreign language proficiencies in Europe found that Spain was among the countries (including Hungary, Portugal, Bulgaria, and Greece) with the highest share of the population speaking no foreign language. In fact, between 2000 and 2008, the average number of languages studied in Spain decreased while it increased for other countries including Germany and Italy[10].

It is possible that with growing economies in Latin America and South America (most of which is Spanish-speaking), and a growing population of Spanish-speakers in the United States, Spain is in a unique position. Spanish could be seen as a mini lingua-franca in the world (behind English and Mandarin) and has reached a scale that French, German, and Italian have not been able to achieve.

4.2 Effects of Migration

Spain has good data available on its foreign-born population, and I was able to run regressions to test if the foreign-born population in Spain affected foreign language education. I hypothesized that there may be a correlation between foreign language study and foreign-born population because 1) Spanish students may decide to learn the languages of the country's major

[10] Mejer, Lene, et al. "More Students Study Foreign Languages in Europe but Perceptions of Skill Levels Differ Significantly." *Eurostat Statistics in Focus.* Oct. 2010. Web. 10 Apr. 2015.

immigrant populations or 2) Spain's partner countries may consider immigrating to Spain at some point in the future and consider learning Spanish as a way of preparing for the potential move.

To test this, I ran regressions between, for example, Spanish students studying French against FDI, imports, and the Spanish population born in France. In addition to controlling for Total Spanish students and the GDP per capita of both countries, I added the additional control of total Spanish population. My hypothesis was largely unsupported because the data show no significant correlation between foreign language studies and the foreign-born population in Spain.

I was also able to track migration between Germany and France, since there were available data on immigrants from France to Germany. However, my regression also failed to show a significant relationship between the number of immigrants and the number of students in Germany and France studying each other's languages.

The results may suggest that students may not choose to learn foreign languages based on exposure to immigrant populations or on planned immigration to another country, and the existing literature does seem to also suggest this. Bleakley and Chin's studies (referenced earlier) focused on immigrants learning the language of their adopted country. Students in the home country seem to have little incentive to study the foreign language of the immigrant population. In addition, although Adsera and Pytlikova suggested that common languages drive decisions for migration[11], it would appear that the students do not make foreign-language learning decisions based on the perceived likelihood of migration. While speaking the language of the destination

[11] Adsera, Alicia and Mariola Pytlikova (2012): "The Role of Language in Shaping International Migration," IZA Discussion Paper No. 6333. Web.

country is likely to drive migration, it appears unlikely based on this empirical analysis that students will learn a partner country's language because of the possibility of migrating there in the future.

4.3 Cultural Factors

The lack of consistency in explaining foreign language study using economic indicators in the six country pairs could come from the overpowering effect of cultural factors in language learning. There have been many studies discussing the strong relationship between culture and foreign language acquisition; see e.g. Alptekin, 2002, Williams, 2002, Kramsch, 1998. Italy, France, and Spain share common cultural roots and language structure, and Italian, French, and Spanish all fall under Latin-based languages. These evolved from spoken Latin between the sixth and ninth centuries, A.D. German, on the other hand, is from a completely different root and is classified as Germanic.[12] When choosing which languages to study, students may also consider the relative ease of learning that language. Students who already speak a romance language as their native tongue may choose to study another romance language because of similar structure, syntax, and cultural circumstances.

Studies have also shown that cultural closeness is strongly correlated to trade and FDI flows[13]. This study does not attempt to factor-in cultural impacts in studying foreign languages, still the models cannot explain language education choices between all the country pairs consistently using economic flows alone.

4.4 Low Sensitivity to Changes in Economic Factors

[12] "The Romance Languages." *Orbus Latinus.* Web. 20 Apr. 2015.
[13] Mac-Dermott, Raymond and Dekuwmini Mornah. "The Role of Culture in Foreign Direct Investment and Trade: Expectations from the GLOBE Dimensions of Culture." *Journal of Business and Management.* 20 Jan. 2015. *Scientific Research,* 63-74. Web.

Another potential explanation for the lack of consistency in using economic indicators to explain foreign language learning is that languages display low sensitivity to changes in economic factors. Acquiring a foreign language takes a long time, and Cummins found in 1981 that one usually needs to study 2-3 years to reach proficiency in basic communicative skills in a second language, and 5-7 years to reach native-speaker levels[14]. Because it takes so long to learn a language, the initial choice of studying a language tends to be "sticky," and people who want to become proficient in a foreign language will have less incentive to switch languages based on short-term changes in economic indicators.

4.5 The Dominance of English

Following the stickiness of foreign languages, people who are studying a foreign language in hopes of using it their careers or business may tend to choose a more universal language that is relatively stable given economic fluctuations. This paper examines the four largest non-English speaking economies in Europe and the language learning that occurs between them, but it fails to take into account the overwhelming effect of learning English as the lingua franca for trade and investments across the region.

In 2010, English was ranked the number one most studied foreign language at all levels of education and also the best known foreign language in terms of perception of proficiency.[15] In fact, many countries including Germany and Italy require English as a foreign language starting from primary school education, and students perceived English to be the most useful foreign language to learn on the European Survey on Language Competencies. There is a significant

[14] Collier (1989). "How Long? A Synthesis of Research on Academic Achievement in a Second Language." *Tesol Quarterly, Vol 23, No.3.* Web.

[15] [15] Mejer, Lene, et al. "More Students Study Foreign Languages in Europe but Perceptions of Skill Levels Differ Significantly." *Eurostat Statistics in Focus.* Oct. 2010. Web. 10 Apr. 2015.

drop on the percentage of students who find English useful versus the percentage of students who find other languages useful. In 2012, in lower secondary and general upper secondary education, over 90% of students were learning English[16]. With the prevalence of English, students learning languages in anticipation of using it in business or economics-related careers may find it beneficial to simply learn English without regard for the languages or trends in economic indicators of other countries.

4.5.1 French, Spanish, German, and Italian Students studying English

Empirical analysis shows that English language education does not behave in the same way as French, German, Spanish, and Italian. I collected panel data on French, German, Spanish, and Italian students studying English and regressed it on FDI and imports between each reporting country ("home country") and the UK. I also accounted for year fixed-effects and country fixed-effects.

Table 2: Least Squares Regression Predicting Number of Home Country Students Studying English (ISCED 2 & 3) on FDI and Trade Flows Between Home Country and UK

Variable	(1) Home Country Students Studying English (ISCED 2)	(2) Home Country Students Studying English (ISCED 2)	(3) Home Country Students Studying English (ISCED 3)	(4) Home Country Students Studying English (ISCED 3)
FDI (Home	-0.000277	-8.04E-05	-0.004255*	-0.000992
Country to UK)	(-0.190)	(-0.052)	(-2.062)	(-0.911)
FDI (UK to	-3.53E-05	0.000325	-0.003611***	-0.000536
Home Country)	(0.047)	(0.387)	(-3.548)	(-0.893)
Imports (Home	-4.38E-07	3.02E-06	-2.41E-05**	7.37E-07
Country to UK)	(-0.087)	(0.388)	(-2.995)	(0.133)
Imports (UK to	4.83E-06	-1.02E-05	1.18E-05	5.41E-06
Home Country)	(0.707)	(-0.983)	(1.012)	(0.738)
Total Home				
Country	0.924813***	0.736269***	1.034174***	1.163545***
Students in	(36.295)	(6.548)	(18.482)	(13.905)

[16] "Key Data on Teaching Languages at School in Europe 2012." *Eurydice.* N.d. *European Commission.* Web.

ISCED 2				
Home Country	4.316878	-13.41834	29.10623**	-2.516596
GDP per capita	(0.730)	(-0.566)	(2.901)	(-0.124)
UK GDP per	5.882782		33.49764**	
capita	(0.903)		(3.270)	
Observations	60	58	60	58

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*
Models (2) and (4) include year fixed-effects and country fixed-effects. These are run without UK GDP per capita to avoid a singular matrix.

The results show that in ISCED 2, the home country's number of students learning English is only significantly correlated to total number of students in ISCED 2. Although in ISCED 3, the number of students in the home country learning English initially appear to be significantly correlated to FDI, imports, total students in ISCED 3, and GDP per capita, those results disappear after accounting for year and country fixed-effects. After accounting for fixed effects, the only significant correlation that remains is that total number of students per ISCED level is correlated to the number of students learning English.

The results show that unlike for French, German, Spanish, or Italian, students seem to choose to learn English regardless of economic flows between the United Kingdom and the home country. It is important to note that English is also spoken in other powerful world economies including the United States and Australia, and that looking at flows between the UK and the reporting countries does not capture the whole picture of the demand for English education. I hypothesize that because English has been shown to be the international lingua franca, it takes away from students' demand for other, less spoken languages, including those studied in this paper.

5. Additional Panel Data Analysis

To find a general effect of FDI and imports on language education, I consolidated my data into panel data format and introduced fixed effects. The home country ("Home") is the country reporting the data, and the partner country ("Partner") is the country for which data is being reported. For example, if Spain were reporting its imports from France, "Spain" would be the home country, "France" would be the partner country, and "Home Students Learning Partner Language" would be Spanish students learning French.

Table 3: Least Squares Regression Predicting Number of Home Country Students Studying Partner Country Language (ISCED 2 & 3) on FDI and Trade Flows Between Home Country and Partner Country

Variable	(1) Home Students Studying Partner Language (ISCED 2)	(2) Home Students Studying Partner Language (ISCED 2)	(3) Home Students Studying Partner Language (ISCED 3)	(4) Home Students Studying Partner Language (ISCED 3)
Imports (Home to Partner)	-9.36E-06**	3.00E-07	8.14E-07	-2.30E-06**
	(-2.629)	(0.224)	(0.348)	(-2.821)
Imports (Partner to Home)	1.82E-05***	-4.36E-06**	-3.10E-06	-1.53E-06^
	(4.376)	(-2.955)	(-1.314)	(-1.960)
FDI (Home to Partner)	0.006545	0.002746*	0.002456	-0.000172
	(1.120)	(2.018)	(0.625)	(-0.217)
FDI (Partner to Home)	0.010542**	0.001058	0.001510	-0.000176
	(1.781)	(0.779)	(0.378)	(-0.217)
Total Home Students in ISCED 2 or 3	-0.071451^	-0.003197	0.172576***	0.062006^
	(-1.906)	(-0.076)	(3.463)	(1.965)
Home GDP per capita	-7.238352	-58.41265***	10.66200	10.83724
	(-0.650)	(-5.740)	(1.354)	(1.468)
Partner GDP per capita	0.341487	15.95796	7.515025	19.29547**
	(0.027)	(1.567)	(0.846)	(3.113)
Observations	178	178	173	173

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*
Models (2) and (4) include year fixed-effects and partner country fixed-effects.

The findings show that again, we do not see a consistent trend across ISCED levels that one factor (imports or FDI) significantly affects the decision to study a partner country's language. For ISCED 2, it appears that imports from Partner to Home are significantly but

negatively correlated with number of students enrolled in Partner Country's language, after accounting for year and country pair fixed-effects. This is counterintuitive and puzzling, because as trade increases, we would expect to see more students studying the partner country's language. On average, FDI from Home to Partner appears to be positively correlated with the number of students learning the partner's language (significant at the 5% level). These results seem to uphold the idea that on average, a common language, or in this case language education, is more important in FDI than in trade. FDI may have a positive impact on the demand for the partner country's language. Home GDP per capita is also negatively correlated to number of students studying partner country's language (at the 0.1% level). This may be explained by the fact that students have less incentive to learn foreign languages if their country is doing well economically, and they may have more incentive to learn foreign languages if their country is not doing well.

For ISCED 3, imports from Home to Partner seems to be negatively correlated with students studying the partner country's language (at the 1% level), and imports from Partner to Home are negatively correlated at the 10% level. Again, this is counterintuitive to my hypothesis. Total home students in ISCED 3 appear to be positively correlated (at the 10% level) to students learning a partner's language, which is intuitive because changes in the number of students will often cause a change in the number of students studying certain languages. Finally, Partner GDP per capita appears to be positively and significantly correlated to total students studying a partner country's language. Again, this follows the intuition that as a country becomes "richer," more students in other countries will want to learn its language to try to benefit from its perceived increase in wealth.

6. Implications

6.1 Further Research

Further research and greater data availability is needed to clarify whether there is a reliable and consistent relationship between economic indicators and foreign language education. I was only able to measure data from 1998-2012, just 15 years of data. The research should be easier to carry out as more data becomes available over the next 15-30 years. Also, given the lack of French data for ISCED 1, I was unable to measure the correlations between primary school students learning foreign languages and the economic indicators of FDI, trade, and migration. Lene, et. al. discovered in 2010 that more and more primary school students were learning foreign languages, but the trend is less pronounced in lower secondary education (ISCED 2)[17]. In the future, it would be interesting to see how primary school foreign language education varies with these economic indicators, since it is primarily in primary school when students (or their parents) decide which foreign language to begin studying.

It would also be interesting to expand the panel data to other country pairs both within and outside of the Euro-zone. It is possible that for countries in the peripheries of the Euro-zone, economics play a much larger role in foreign language education. When most of a country's GDP is comprised of trade with other countries, it becomes increasingly more important to learn foreign languages.

It is important for research to continue in this area, as language education and the increased need for global communication come to the forefront in the light of economic globalization. As globalization continues, it becomes more and more important for young people,

[17] Mejer, Lene, et al. "More Students Study Foreign Languages in Europe but Perceptions of Skill Levels Differ Significantly." *Eurostat Statistics in Focus.* Oct. 2010. Web. 10 Apr. 2015.

especially students, to figure out which skills they need to prepare themselves for the changing society.

7. Appendix

7.1 Number of Reporting/Home Country's Students Studying Partner Country's Language predicted by FDI and Trade Flows between Each Country Pair

7.1.1 France-Spain Regressions

Least Squares Regression Predicting Number of French Students Studying Spanish (ISCED 2) on FDI and Trade Flows Between France and Spain

Variable	(1) French Students Studying Spanish	(2) French Students Studying Spanish	(3) French Students Studying Spanish
Imports (France to Spain)	1.24E-05** (3.77)	1.23E-05** (3.71)	-1.15E-05** (-3.74)
Imports (Spain to France)	-5.71E-06 (-1.48)	-6.56E-06 (-1.64)	6.72E-06* (2.74)
FDI (France to Spain)	-0.001890 (-0.49)	-0.001502 (-0.39)	-0.003415* (-2.51)
FDI (Spain to France)	0.006740^ (1.96)	0.008936^ (2.13)	0.002958^ (2.01)
Total French Students in ISCED 2		-0.416811 (-0.92)	0.039391 (0.239)
France GDP per capita			56.78693** (4.79)
Spain GDP per capita			-9.372842 (-1.07)
Observations	15	15	15

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

***Note: All regressions below control for total students in each reporting country by ISCED level and both country's GDP per capita for all country pairs.*

Least Squares Regression Predicting Number of French Students Studying Spanish (ISCED 3) on FDI and Trade Flows Between France and Spain

Variable	French Students Studying Spanish

	(ISCED 3)
Imports (France to Spain)	4.48E-06 (3.71)
Imports (Spain to France)	-2.70E-06 (-0.53)
FDI (France to Spain)	-0.003046 (-1.27)
FDI (Spain to France)	0.006374* (2.49)
Total French Students in ISCED 3	-0.053403 (-0.23)
France GDP per capita	48.63555 (1.84)
Spain GDP per capita	-10.93915 (-0.66)
Observations	15

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

Least Squares Regression Predicting Number of Spanish Students Studying French (ISCED 2 and 3) on FDI and Trade Flows Between France and Spain

Variable	Spanish Students Studying French (ISCED 2)	Spanish Students Studying French (ISCED 3)
Imports (France to Spain)	9.61E-06 (1.34)	-2.56E-05^ (-2.08)
Imports (Spain to France)	-2.66E-06 (-0.52)	1.75E-05 (1.90)
FDI (France to Spain)	0.001039 (0.53)	-0.001101 (-0.47)
FDI (Spain to France)	-0.001164 (-0.60)	-0.005419 (-1.84)
Total Spanish Students in ISCED 2 or 3	0.319933*** (7.94)	0.196867* (3.92)
France GDP per capita	-42.14811 (-1.75)	25.73754 (0.70)
Spain GDP per capita	-3.313902 (-0.25)	13.32128 (0.69)
Observations	15	15

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

7.1.2 France-Italy Regressions

Least Squares Regression Predicting Number of French Students Studying Italian (ISCED 2 and 3) on FDI and Trade Flows Between France and Italy

Variable	French Students Studying Italian (ISCED 2)	French Students Studying Italian (ISCED 3)
Imports (France to Italy)	5.83E-07	4.88E-07
	(0.68)	(0.88)
Imports (Italy to France)	-3.77E-07	-1.93E-07
	(-0.43)	(-0.31)
FDI (France to Italy)	-0.000299	-0.000240
	(-1.13)	(-1.20)
FDI (Italy to France)	-0.000228	-0.000205
	(-1.35)	(-1.81)
Total French Students in ISCED 2 or 3	0.038566	0.021784***
	(1.16)	(5.35)
France GDP per capita	-6.967244**	-1.451903
	(-3.53)	(-1.03)
Italy GDP per capita	10.27671**	3.846170*
	(5.24)	(2.55)
Observations	15	15

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

Least Squares Regression Predicting Number of Italian Students Studying French (ISCED 2 and 3) on FDI and Trade Flows Between France and Italy

Variable	Italian Students Studying French (ISCED 2)	Italian Students Studying French (ISCED 3)
Imports (France to Italy)	-1.08E-05	1.07E-05^
	(-0.75)	(1.99)
Imports (Italy to France)	2.08E-05	-8.48E-06
	(1.36)	(-1.51)
FDI (France to Italy)	-0.011683^	-0.002438
	(-2.35)	(-1.41)
FDI (Italy to France)	-0.008167*	-0.001203
	(-3.08)	(-1.19)
Total Italian Students in ISCED 2 or 3	-6.970842***	-0.006595
	(-6.31)	(-0.04)
France GDP per capita	152.0284**	-45.90265*
	(5.25)	(-3.54)
Italy GDP per capita	-114.0221**	33.01866*

	(-3.88)	(2.56)
Observations	15	15

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

7.1.3 France-Germany Regressions

Least Squares Regression Predicting Number of French Students Studying German (ISCED 2 and 3) on FDI and Trade Flows between France and Germany

Variable	French Students Studying German (ISCED 2)	French Students Studying German (ISCED 3)
Imports (France to Germany)	-4.13E-06	-7.79E-08
	(-1.73)	(-0.09)
Imports (Germany to France)	5.49E-06*	2.94E-07
	(2.54)	(0.34)
FDI (France to Germany)	-4.51E-05	-0.000404
	(-0.05)	(-1.04)
FDI (Germany to France)	0.000527	-0.000119
	(0.29)	(-0.17)
Total French Students in ISCED 2 or 3	0.143761	0.083513
	(0.59)	(1.11)
France GDP per capita	-48.04077**	-49.13017***
	(-4.39)	(-12.29)
Germany GDP per capita	45.31321*	25.32143**
	(3.29)	(4.51)
Observations	15	15

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

Least Squares Regression Predicting Number of German Students Studying French (ISCED 2 and 3) on FDI and Trade Flows between France and Germany

Variable	German Students Studying French (ISCED 2)	German Students Studying French (ISCED 3)
Imports (France to Germany)	-2.72E-06	-9.87E-07
	(-1.05)	(-0.69)
Imports (Germany to France)	3.74E-06	2.00E-06
	(1.46)	(1.50)
FDI (France to Germany)	0.000739	0.000169
	(0.67)	(-0.29)
FDI (Germany to France)	0.001781	-0.002227^

	(0.95)	(-2.03)
Total German Students in ISCED 2 or 3	0.086581	-0.181894^
	(1.27)	(-2.27)
France GDP per capita	23.14234	8.666083***
	(1.65)	(1.05)
Germany GDP per capita	-10.41205	-8.278797**
	(-0.48)	(-0.85)
Observations	15	15

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

7.1.4 Spain-Italy Regressions

Least Squares Regression Predicting Number of Spanish Students Studying Italian (ISCED 2 and 3) on FDI and Trade Flows Between Spain and Italy

Variable	Spanish Students Studying Italian (ISCED 2)	Spanish Students Studying Italian (ISCED 3)
Imports (Spain to Italy)	4.54E-09	2.13E-07
	(0.10)	(1.50)
Imports (Italy to Spain)	5.15E-08	-2.41E-07*
	(1.20)	(-2.73)
FDI (Spain to Italy)	-7.25E-05	-0.000155
	(-0.96)	(-0.73)
FDI (Italy to Spain)	4.79E-06	-1.77E-06
	(0.37)	(-0.06)
Total Spanish Students in ISCED 2 or 3	0.001474*	0.000697
	(3.18)	(1.02)
Spain GDP per capita	-0.084069	-0.110435
	(0.83)	(-0.12)
Italy GDP per capita	0.045505	0.218596
	(0.93)	(0.19)
Observations	15	13

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

Least Squares Regression Predicting Number of Italian Students Studying Spanish (ISCED 2 and 3) on FDI and Trade Flows Between Italy and Spain

Variable	Italian Students Studying Spanish (ISCED 2)	Italian Students Studying Spanish (ISCED 3)
Imports (Spain to Italy)	-2.99E-05***	-1.18E-05*
	(-15.65)	(-4.19)
Imports (Italy to Spain)	3.27E-05***	1.31E-05*

	(20.42)	(4.01)
FDI (Spain to Italy)	0.017882**	0.006327
	(5.24)	(1.38)
FDI (Italy to Spain)	0.002608**	0.001037
	(4.60)	(1.31)
Total Italian Students in ISCED 2 or 3	-0.564808*	-0.134535
	(-2.67)	(-0.77)
Spain GDP per capita	155.4365***	42.49252
	(8.22)	(1.80)
Italy GDP per capita	-182.4773***	-40.04263
	(-7.50)	(-1.37)
Observations	15	15

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

7.1.5 Spain-Germany Regressions

Least Squares Regression Predicting Number of Spanish Students Studying German (ISCED 2 and 3) on FDI and Trade Flows Between Spain and Germany

Variable	Spanish Students Studying German (ISCED 2)	Spanish Students Studying German (ISCED 3)
Imports (Spain to Germany)	-7.82E-08	8.40E-08
	(-0.33)	(0.91)
Imports (Germany to Spain)	1.22E-07	-3.23E-07
	(0.24)	(-1.47)
FDI (Spain to Germany)	6.63E-05	1.68E-05
	(0.30)	(0.19)
FDI (Germany to Spain)	-0.000373	0.000120
	(-1.67)	(1.36)
Total Spanish Students in ISCED 2 or 3	0.016277**	0.007205**
	(4.37)	(5.30)
Spain GDP per capita	1.822054^	1.279144*
	(2.01)	(3.33)
Germany GDP per capita	-0.444101	-1.502919*
	(-0.42)	(-3.07)
Observations	14	13

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

Least Squares Regression Predicting Number of German Students Studying Spanish (ISCED 2 and 3) on FDI and Trade Flows Between Spain and Germany

Variable	German Students Studying Spanish (ISCED 2)	German Students Studying Spanish (ISCED 3)
Imports (Spain to Germany)	-1.92E-06 (-2.82)	-2.03E-06** (-3.79)
Imports (Germany to Spain)	3.17E-06 (1.79)	6.04E-06** (5.33)
FDI (Spain to Germany)	5.46E-05 (0.10)	-0.000217 (-0.51)
FDI (Germany to Spain)	-0.000268 (-0.53)	-0.001501* (-3.05)
Total German Students in ISCED 2 or 3	-0.018663 (-0.85)	0.018594 (0.41)
Spain GDP per capita	8.971644* (4.92)	4.733158* (2.51)
Germany GDP per capita	3.219897 (1.56)	11.53989** (5.47)
Observations	14	14

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

7.1.6 Italy-Germany Regressions

Least Squares Regression Predicting Number of Italian Students Studying German (ISCED 2 and 3) on FDI and Trade Flows Between Italy and Germany

Variable	Italian Students Studying German (ISCED 2)	Italian Students Studying German (ISCED 3)
Imports (Italy to Germany)	-1.13E-06 (-0.76)	-1.71E-06 (-1.58)
Imports (Germany to Italy)	3.21E-06 (1.40)	1.75E-06 (1.19)
FDI (Italy to Germany)	-0.000965 (-0.83)	-0.000828 (-0.92)
FDI (Germany to Italy)	0.001064 (1.36)	-0.000339 (-0.58)
Total Italian Students in ISCED 2 or 3	0.011335 (0.04)	-0.020810 (-0.18)
Italy GDP per capita	9.775634 (1.24)	13.78868* (2.43)
Germany GDP per capita	0.645934 (0.08)	-9.439579^ (-2.00)
Observations	15	15

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*

Least Squares Regression Predicting Number of German Students Studying Italian (ISCED 2 and 3) on FDI and Trade Flows Between Italy and Germany

Variable	German Students Studying Italian (ISCED 2)	German Students Studying Italian (ISCED 3)
Imports (Italy to Germany)	-2.24E-07 (-1.88)	1.01E-07 (0.30)
Imports (Germany to Italy)	2.43E-07 (1.23)	1.22E-07 (0.28)
FDI (Italy to Germany)	-8.57E-05 (-0.99)	0.000137 (0.56)
FDI (Germany to Italy)	-2.50E-05 (-0.41)	0.000190 (1.30)
Total German Students in ISCED 2 or 3	-0.007542 (-1.35)	-0.028279 (-1.27)
Italy GDP per capita	2.802290* (4.18)	1.630660 (0.73)
Germany GDP per capita	-1.812555* (-2.76)	1.504923 (0.76)
Observations	15	15

t-statistics in parentheses
*^ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001*