

Trade and Portuguese Immigration

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A*bstract.* This manuscript examines the link between trade and migration flows using a gravity model for the period 1995-2007 between Portugal and European Union countries. We also include in our sample the Portuguese speaking countries (PALOPS), i.e., ex-colonies. Globalization drives people to migrate, in some countries, immigration being more pronounced (as in Portugal, in last decade, this country receiving foreign residents). This is a new reality to Portuguese economy. For many years, the Portuguese have emigrated to European countries, the United States of America and other countries. Currently, Portugal is witnessing a reverse trend, Brazilian, Cape Verde, Ukrainian and Romanian communities choose Portugal as a destination country. We find evidence that immigration has a positive influence in bilateral trade. We also introduce economic size and regional trade agreements (RTA); these proxies confirming a positive impact of bilateral trade. These results show that the gravity model can explain the pattern of bloc's trade. Our results also confirm the hypothesis that trade increases if the transport decreases.

Key words: Trade, Immigration, Gravity model; Portugal

JEL Classification: F14, F22

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1. Introduction

During the 1980s and 1990s various papers dealt with globalization and regionalization on a global scale (Ohmae, 1995, Oman, 1994, Dunning, 1993). When the New Economic Geography was revisited by Paul Krugman (1993) through the centre versus periphery model, migration flows gained importance again in the international economics.

Furthermore, enlargement of the European Union allowed the academic community to attend this issue. In fact this (trade and immigration) issue has gained numerous enthusiastic followers in recent years. There are good reasons for studying the relationship between trade and immigration. Firstly, before the entry of Portugal into the European Economic Community (EEC) in 1986, emigration (Portuguese residents abroad) had a substantial weight in the Portuguese economy, i.e., the phenomenon of immigration (foreign resident) being recent in Portugal. Secondly, there are many studies on the impact of immigration on Portuguese trade. There are previous studies (Leitão and Faustino, 2007, Faustino and Leitão, 2008) showing that immigration has a positive impact on product differentiation.

This study examines the link between immigration and bilateral trade concerning Portugal and European Union countries. We also include in our sample the Portuguese speaking countries (PALOPS), i.e., ex-colonies for the period 1995-2007. In static panel data models, Pooled OLS, fixed-effects (FE) and random-effects (RE) estimators are used (see Ghatak et al., 2009, Faustino and Leitão, 2008). This study also introduced in the analysis the Tobit model to forecast trade and migration flows. This methodology is important for evaluating and forecasting the policy implications.

The paper is organized as follows: the next section presents the literature review. In the third section, we present the methodology and the econometric model. The fourth section analyses the results. Finally, we make our concluding remarks in the fifth section.

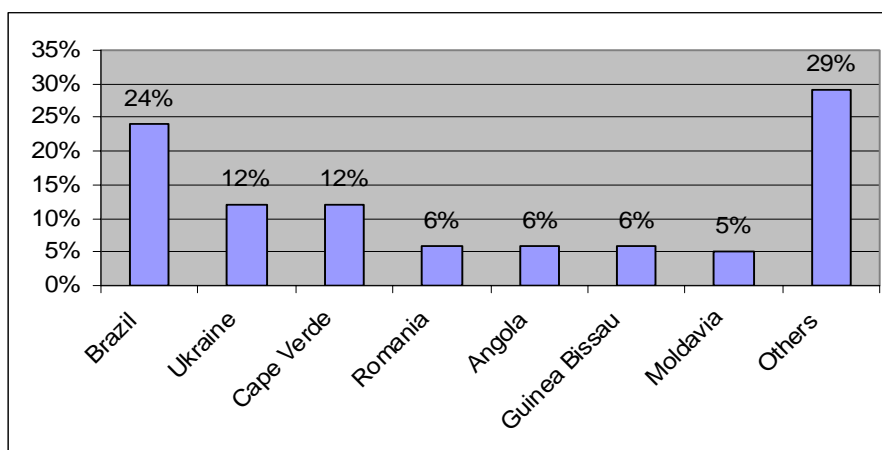
2. Literature Review

The purpose of this section is to make a brief reflection on the relationship between trade and immigration. We begin by examining the concept of immigration. Then we evaluate the trade and immigration relationship.

2.1. Immigration: Concept and Portuguese Experience

According to the European Union (2007) and the Regulation no. 862/2007 of the European Parliament, the concept of immigration involves the movement to a host country for a period exceeding one year. The phenomenon of immigration in Portugal can be explained in four stages. The first phase emerges after the colonial period between 1975 and 1985. The Portuguese, from the former colonies, returned to their homeland, but also watched the arrival of African immigrants in Cape Verde, Guinea-Bissau and Angola. Cape Verde migratory movements had already begun in the 1960s. The second phase occurred in 1986 and ended in the 1990s. This phase is characterized by cultural and linguistic proximity, i.e., Brazilian immigrants. The third migratory phase emerges in the late 1990's and ends at the beginning of the millennium, characterized by the immigration of Brazilian origin and the immigration from Eastern European countries. A fourth phase started in the early years of the current decade in which we can mention the following: i) the period of economic crisis, in which we observe a decrease of immigration from Eastern Europe; ii) the balance from Portuguese speaking countries (PALOPS); iii) new entry of Brazilian immigrants.

Figure 1: Foreign Residents, Major Nationalities (2007)



Source: Portuguese Border Services "Serviço de Fronteiras", (Ministry of Internal Affairs).

In Figure 1, the main foreign residents in Portugal are displayed. The Brazilian, Cape Verdean and Ukrainian residents are the ones that stand out, followed by Romanians.

2.2. Trade and Immigration

In the context of economic globalization, cultural affinity, history and language can promote trade relations. The asymmetry of economic policy discourages bilateral trade relations. Immigration promotes bilateral trade between nations. Foreign residents promote the host country creating links between trade, services and friendly relations. The studies of trade and migration have developed separately from the second half of the 20th century.

This relationship between trade and migration is generally explained by transaction costs (Girma and Yu, 2002). Immigration flows provide information and create relationships of interdependence between two economies, reducing transaction costs. The study by Head and Ries (1998) revealed a positive correlation between the flows of immigration and Canadian imports. Dunlevy and Hutchinson (2001), Gould (1994), and Min (1990) found a positive correlation between immigration and bilateral trade.

Recent studies (Blanes, 2005) show that immigration is positively correlated with intra-industry trade. This type of trade is explained by product differentiation, economies of scale and industrial concentration. In the Portuguese case (Leitão and Faustino, 2007, Faustino and Leitão, 2008, and Faustino et al., 2009) also observed a positive effect on the stock of immigrants on the intra-industry trade.

International trade and tourism can be explained by international migratory movements. According to Gould (1994), Girma and Yu (2002) and Blanes (2005) immigrants influence positively trade through two channels: the channel of preferences (the immigrants have a preference for products from countries of origin) and the channel of reduced transaction costs (due to the networks for immigrants).

3. Methodology and Data

This model is analogous to Newton's Law of Gravity, which states that the gravity between two objects is directly related to their masses and inversely related to the distance between them.

$$VFC_{ij} = G \frac{Y_i^\alpha Y_j^\beta}{D_{ij}^\delta} \quad (1)$$

where: VFC_{ij} denotes the value of flow of the commodities from local (i) to destination (j) countries; Y_i and Y_j are the economic size of the two countries, usually measured as the gross domestic product (GDP), or per capita GDP. D_{ij} is the distance between countries. G is a gravitational constant.

In order to facilitate the econometric estimations, we apply logs to the gravity equation (1) and, hence, we obtain a linear relationship as follows:

$$\ln VFC_{ij} = \ln G + \alpha \ln Y_i + \beta \ln Y_j - \delta \ln D_{ij} \quad (2)$$

where: $\ln G$ corresponds to the intercept, while α , β and δ are elasticity's.

According to the gravity approach, the trade between two countries is directly related to their incomes (or per capita incomes) and inversely related to the distance between them.

Since the pioneering studies (Tinbergen, 1962, Pöyhönen, 1963, Anderson, 1979, Pagoulatos and Sorensen, 1975, Caves, 1981, Toh, 1982, and Krugman, 1997) the geographic distance has been an important determinant of trade. The distance can be analyzed in terms of geography, culture, language and adjacency (border). Rauch (1999) and Eichengree and Irwin (1998) emphasize the importance of border and common language.

Anderson (1979) introduced the product differentiation by country of origin assumption. A few years later (Bergstrand, 1985) used the income per capita to specify the supply side of economies.

Usually geographic distance measures the cost of transport. According to the literature, there is an increase in trade flows if transportation cost decreases. The theoretical predictions show a negative correlation between distance and trade. Balassa (1966), Balassa and Bauwens (1987) found a negative sign between geographical distance and trade.

The similarities between countries encourage bilateral trade. The study of Frankel et al. (1998) demonstrates the importance of these qualitative variables to analyze the regional trading agreements (RTAs). Balassa (1966) and Balassa and Bauwens (1987) found a positive sign. The empirical studies show that gravity models utilize gravitational factors such as volume of trade, capital flows, and migration.

3.1. Econometric Model

Following the literature, our study applies a gravity equation with panel data. The dependent variable used is Portuguese bilateral trade. The data for the

explanatory variables is sourced from the OECD statistics, and, similarly, the source used for the dependent variable is NIS (National Institute of Statistics) at five-digit level.

Model Specification

The panel equation model implies the following formula:

$$TRADE_{it} = \beta_0 + \beta_1 X_{it} + \delta t + \eta_i + \varepsilon_{it} \quad (3)$$

where: $TRADE_{it}$ is bilateral trade (exports plus imports), X is a set of explanatory variables. All variables are in the logarithm form: η_i is the unobserved time-invariant specific effects; δt captures a common deterministic trend; ε_{it} is a random disturbance assumed to be normal, and identically distributed (IID) with $E(\varepsilon_{it})=0$; $Var(\varepsilon_{it}) = \sigma^2 \phi 0$.

3.2. Explanatory Variables and Proof of the Hypothesis

Hypothesis 1: There is a positive relationship between differences in income per-capita and bilateral trade.

Economic differences between countries (DGDP): this is the difference in GDP (PPP, in current international dollars) between Portugal and the partner country:

$$\left| GDP^{Portugal} - GDP^{partner} \right| \quad (4)$$

Regarding Hypothesis 1, Linder's model (1961) suggests a positive effect of different income on bilateral trade and Ghatak et al. (2009), and Martinez-Zarzoso and Lehman and Nowak (2003) found a positive relationship between income differences.

Hypothesis 2: If we assume that immigration is associated with differentiated products and reducing transaction costs the sign should be positive.

Hypothesis 2 is supported in Blanes (2005) and Faustino and Leitão (2008). They found a positive relationship between immigration and bilateral trade. This proxy collected from the Border Services "Serviço de Fronteiras", (Ministry of Internal Affairs), corresponds to legal immigrants in Portugal.

Hypothesis 3: The larger economic dimension (average of GDP) increases bilateral trade.

Hypothesis 3 is supported in Egger (2002) and Grossman and Helpman (2005), i.e. economies of scales, and product differentiation.

$$\frac{1}{2}(GDP^{Portugal} + GDP^{partner}) \quad (5)$$

Hypothesis 4: Trade increases when partners are geographically close.

Ghatak et al. (2009) and Martinez-Zarzoso and Lehman and Nowak (2003) found a negative relationship between distance and bilateral trade. The geographic distance between Portugal and each partner in km (DIST) is the variable used.

Hypothesis 5: Regional Trade Agreements (RTA) promotes bilateral trade.

RTA (Regional Trade Agreements) implies lower transport costs, i.e. reduction of trade barriers. According to the theoretical model we expect a positive sign.

EU is a dummy variable that equals 1 if the trade partner is a member country of EU, 0 otherwise.

4. Empirical Results

In this section we present the estimates for the relationship between trade and immigration. We decided to present the most of the estimators used in such studies (OLS with time dummies, Random effects, and TOBIT model).

OLS with time dummies, and Random effects are reported in Table 1. The coefficient of the immigration variable is statistically significant, with an expected positive sign. The results are according to previous studies (Balanes, 2005, Faustino and Leitão, 2008, and White, 2009). The stock of immigration is associated with differentiated products and reduction in the transportation costs.

As expected, the economic differences between partners (LogDGDP) are significant, with an expected positive sign. These results are according to the theoretical models. The average of income per capita (economic dimension), the dominant paradigm, predicts a positive sign. The results confirm a positive effect on trade when we used the Random effect estimator.

The geographical distance has been used as a typical gravity model variable. The coefficient of LogDIST (distance) is negative as expected. This result confirms the gravitational model theory and the importance of the

neighbourhood. Badinger and Breuss (2008), Ghatak et al. (2009), and Martinez-Zarzoso and Lehman and Nowak (2003) also found a negative sign.

The regional trade agreements (EU) present a positive sign. According to theoretical and empirical models (Leitão, Faustino and Yoshida, 2010) this implies lower transport costs, i.e. reduction of trade barriers.

Table 1: Trade and Immigration: OLS with time dummies and Random effect estimator

Variables	OLS with time dummies		Random Effect Estimator		Expected Sign
	Coefficient	t-Statistics	Coefficient	t-Statistics	
LogImmigration	1.267	(4.819)***	0.045	(1.753)*	(+)
LogDGDP	0.168	(4.821)***	0.305	(7.584)***	(+)
LogDIM	1.410	(0.697)	0.379	(10.055)***	(+)
LogDIST	-2.228	(-2.611)**	-3.065	-1.146	(-)
EU	4.032	(4.261)***	3.3707	(2.247)***	(+)
C	-0.368	-0.038	15.828	(1.586)	
Adj. R ²	0.470		0.280		
Observations	146		146		

T- statistics (heteroskedasticity corrected) are in round brackets.

***/**/* statistically significant, respectively at the 1%, 5 and 10% levels.

Source: Authors' calculations.

In Table 2 we see the results with Tobit's model. The model presents the following statistically significant variables: LogImmigration, at 1%, LogDGDP, at 1%, LogDIST, at 5%, and EU at 1%. The effect of the stock of immigrants on Portuguese bilateral trade is positive. These results confirm the hypothesis that immigrants' information mechanism reduces the trade transaction costs in differentiated products. The difference between per capita incomes (LogDGDP) presents a positive sign, this result being according to the formulated hypothesis.

Table 2: Trade and Immigration: Tobit Model

Variables	Coefficient	t-Statistics	Expected Sign
LogImmigration	1.267	(5.000)***	(+)
LogDGDP	0.1681	(5.405)***	(+)
LogDIM	1.410	(1.571)	(+)
LogDIST	-2.228	(-2.365)**	(-)
EU	4.032	(6.778)***	(+)
C	-0.368	-0.069	
SIGMA	2.169	(17.088)***	
Observations	146		
Log likelihood	-320.224		

T- statistics (heteroskedasticity corrected) are in round brackets.

***/** statistically significant, respectively at the 1% and 5 % levels.

Source: Authors' calculations.

The coefficient, LogDIST (distance in logs) can be used as a proxy for trade transaction costs and capture part of these costs. The results demonstrate that this variable has the correct sign. For the dummy variable, EU has expected a positive sign, providing evidence that the effect of immigration on Portuguese trade is greater for the trade between European countries than for the trade with other countries which do not share the same cultural background.

5. Conclusions

Portuguese immigration has been subject to little analysis. The objective of this study was to analyze the link between immigration and bilateral trade. The results show the importance of immigration on bilateral trade. The variable LogDGDP used to evaluate the similarities between trade partners presents a positive correlation on trade, when we use OLS estimator with time dummies, and TOBIT model.

The proxy used for the economic dimension (DIM) is according to the literature, i.e. the market size influences the volume of trade. It is usual that the literature attributes a negative sign to geographical distance, i.e. trade increases if the

partners are geographically close. Our study demonstrates the importance of economic integration since the variable EU has a positive sign. This study has some limitations. In the future, other control variables, i.e. language, cultural and religious similarity, human capital might be included in the model.

References

1. Anderson, J.E. (1979), 'A Theoretical Foundation for the Gravity Equation', *The American Economic Review*, 69 (1), 106-116.
2. Badinger, H.; Breuss, F. (2008), 'Trade and productivity: an industry perspective', *Empirica*, 35, 213-231.
3. Balassa, B (1966), 'Tariff Reductions and Trade in Manufactures among Industrial Countries', *American Economic Review*, 56(3), 466-473.
4. Balassa, B.; Bauwens, L. (1987), 'Intra-Industry Specialization in Multi-Country and Multi-Industry Framework', *The Economic Journal*, 923-939.
5. Bergstrand, H. (1985), 'The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence', *Review of Economics and Statistics*, 67(3), 474-481.
6. Blanes, J. (2005), 'Does immigration help to explain intra-industry trade? Evidence for Spain', *Review of World Economics*, 141: 244-270.
7. Caves, E. (1981), 'Intra-Industry Trade and Market Structure in Industrial Countries', *Oxford Economic Papers*, 203-223.
8. Dunning, J. (1993), *Globalisation: The Challenge for National Economic Regimes*, Dublin: Economic and Social Research Council.
9. Dunlevy, J.; Hutchinson, W. (2001), 'The pro-trade effect of immigration on American exports during the late nineteenth and early twentieth centuries', IZA Discussion Papers 375.
10. Eichengreen, B.; Irwin, D. (1998), 'The Role of History in Bilateral Flows', in *The Regionalization of the World Economy*, Jeffrey A. Frankel (ed), University of Chicago, Press.
11. Egger, P. (2002), 'An Econometric View on the Estimation of Gravity Models and the Calculation of Trade Potentials', *World Economy*, 25, 297-312.
12. Faustino, H.; Leitão N.C. (2008), 'Using the Gravity Equation to Explain the Portuguese Immigration- Trade Link', WP/12/2008, ISEG-UTL.
13. Faustino, H.; Peixoto, J.; Baptista, P. (2009), "As características da Imigração em Portugal e os seus efeitos no Comércio Bilateral", *Observatório da Imigração*, p.237.
14. Faustino, H.C.; Leitão, N.C. (2008), 'Immigration and Trade in Portugal: A Static and Dynamic Panel Data Analysis', WP 31/2008/DE/SOCIUS, School of Economics and Management, Technical University of Lisbon, Department of Economics, <http://pascal.iseg.utl.pt/~depeco/wp/wp312008.pdf>.
15. Frankel, J.; Rose, A. (1998), 'The Endogeneity of the Optimum Currency Area Criteria', *The Economic Journal* 108, 1009-1025.
16. Ghatak, S.; Silaghi, M.; Daly, V. (2009), 'Trade and migration flows between some CEE countries and the UK', *The Journal of International Trade and Economic Development* 18 (1): 61-78.

17. Girma, S.; Yu, Z. (2002), 'The link between immigration and trade: Evidence from UK', *Weltwirtschaftliches Archiv* 138: 115–130.
18. Gould, D. (1994), 'Immigration links to the Home Country: Empirical implications for US bilateral trade flow', *The Review of Economic and Statistics* 76: 302–316.
19. Grossman, G.; Helpman, E. (2005), 'A Protectionist Bias in Majoritarian Politics', *Quarterly Journal of Economy* 120, 1239-1282.
20. Head, K.; Ries, J. (1998), 'Immigration and trade creation: Econometric evidence from Canada', *Canadian Journal of Economics* 31: 47–62.
21. Leitão, N.C.; Faustino, H.C. (2007), 'The Impact of Immigration on Portuguese Intra-Industry Trade', *Global Management*, Proceeding of the IASK International.
22. Leitão, N.C.; Faustino, H.; Yoshida, Y. (2010), 'Fragmentation, Vertical Intra-Industry Trade and Automobile Components', *Economics Bulletin* 30 (2), 1006-1015.
23. Krugman, P. (1993), *Geography and Trade*, First MIT Press paperback edition.
24. Krugman, P. (1997), *Development, Geography and Economic Theory*, First MIT Press paperback edition.
25. Martinez-Zarzoso, I.; Lehman-Nowak, F. (2003), 'Augmented gravity model: An empirical application to Mercosur-European Union Trade flows', *Journal of Applied Economics*, VI: 291–316.
26. Ohmae, K. (1995), *The End of the Nation State: The Rise of Regional Economies*, New York: The Free Press.
27. Oman, C. (1994), *Globalisation and Regionalisation: The Challenge for Developing Countries*, Paris: Organisation for Economic Cooperation and Development (OECD).
28. Pagoulatos, E.; Sorensen, R. (1975), 'Two-Way International Trade: An Econometric Analysis', *Weltwirtschaftliches Archiv* (3), 454-465.
29. Pöyhönen, P. (1963), 'A Tentative Model for the Volume of Trade between Countries', *Weltwirtschaftliches Archiv* 90 (1): 93-99.
30. Rauch, J. (1999), 'Networks versus Markets in International Trade', *Journal of International Economics*, 48 (1), 7-35.
31. Tinbergen, J. (1962), *Shaping the World Economy*, New York: The Twentieth Century Fund Inc.
32. Toh, K. (1982), 'A Cross-Section Analysis of Intra- Industry Trade in U.S Manufacturing Industries', *Weltwirtschaftliches Archiv* (118), 281-301.
33. União Europeia (2007), 'Regulamento (CE) nº862/2007 do Parlamento Europeu e do Conselho de 11 de Julho de 2007 relativo às estatísticas comunitárias sobre migração e protecção internacional e que revoga o Regulamento (CEE) nº 311/76 do Conselho relativo ao estabelecimento de estatísticas sobre trabalhadores estrangeiros', *Jornal Oficial da União Europeia*, 31 de Julho de 2007.
34. White, R. (2009), 'Immigration, Trade and Home Country Development: State-Level Variation in the US Immigrant-Export-Link', *Journal of International Migration and Integration*, 10 (2), 121-143.