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***The migration-trade nexus in the presence of
vertical and horizontal product differentiation***

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Chapter 1

INTRODUCTION

1.1 International migration and Intra-Industry Trade

One of the most important global issues of the early twenty-first century is surely international migration since more and more people are moving abroad today than at any other point in human history. Currently, about 214 million people are living outside their place of birth; this means that about three percent of the world's population and roughly one out of every thirty-three persons in the world today is a migrant¹.

The population growth in the European Union registered between the years 2000 and 2008 has been towed by the foreign component which has increased by 3.7% against a boost of total population by 0.6%. Moreover, foreign population has kept increasing during the recession of 2009 as well: +4.3% compared to total +0.4% (table 1.1).

Table 1.1 - Total and foreign population in the top 10 European countries. Years 2000, 2008 and 2009 (absolute values in thousands, annual var. % and comp. %).

Paese	Popolazione totale			Popolazione straniera			Var.% 00-08		Var.% 08-09		% stranieri sul totale	
	2000	2008	2009	2000	2008	2009	Totale	Straniera	Totale	Straniera	2000	2009
Germania	82.163	82.218	82.002	7.336	7.255	7.186	0,0	-0,1	-0,3	-1,0	8,9	8,8
Spagna	40.050	45.283	45.828	820	5.262	5.651	1,5	26,2	1,2	7,4	2,0	12,3
Gran Bretagna	58.662	61.176	61.595	2.391	4.021	4.214	0,5	6,7	0,7	4,8	4,1	6,8
Italia	60.269	59.619	60.045	3.764	3.433	3.891	0,4	13,2	0,7	13,4	2,2	6,5
Francia	57.680	63.753	64.367	1.271	3.674	3.738	0,7	-0,3	1,0	1,7	6,2	5,8
Belgio	10.239	10.667	10.750	897	971	1.103	0,5	1,0	0,8	13,5	8,8	10,3
Grecia	10.880	11.214	11.260	402	906	930	0,4	10,7	0,4	2,6	3,7	8,3
Austria	8.002	8.319	8.355	699	835	871	0,5	2,3	0,4	4,3	8,7	10,4
Paesi Bassi	15.864	16.405	16.486	652	688	719	0,4	0,7	0,5	4,5	4,1	4,4
Irlanda	3.787	4.401	4.450	127	554	512	1,9	20,3	1,1	-7,5	3,3	11,5
Area Euro (16)	313.288	326.908	328.646	16.598	24.615	25.672	0,5	5,0	0,5	4,3	5,3	7,8
Unione Europea (27)	475.121	497.431	499.432	23.047	30.779	32.116	0,6	3,7	0,4	4,3	4,9	6,4

Source: Report 2011 on immigration, Ministry of labor and social policy.

¹ United Nations Department of Economic and Social Affairs (UN DESA), Trends in International Migrant Stock: The 2008 Revision, <http://esa.un.org/migration/index.asp?panel=1>

Among European countries, Italy and Germany (the two countries investigated in this thesis) are those which historically have been involved in the migratory phenomenon. Germany is the European Union country in which is living the largest number of foreigners (in absolute values): 7.2 million, on the January 1, 2011, that is 8.8 percent of total population (Eurostat data). To make the number of immigrants per inhabitant in Germany larger than that of the traditional immigration countries in the 1980s (USA, Canada and Australia), were two waves of immigration: one is that following the Second World War, when the economic boom made the German production mostly depending on the presence of foreign workers; the other one is that related to the immigration of the so-called *Aussiedler*, namely people of German origin, for many generations lived in the Ex Soviet Union countries, in Romania and Poland and come back to Germany above all after the collapse of communism. According to the Federal Statistical Office, at the moment, about 15 million people with a past of migration are living in Germany. Among them, 7 million are foreigners and 8 million acquired the German citizenship (e.g. the *Aussiedler*).

As far as Italy is regarded, from 1861 to 1985, the biggest emigration in modern European history took place. Around one out of every four Italians emigrated, mostly to other European countries and the Americas, during that which is known as “the mass emigration period”². After the Second World War, the Italian government reduced the economic incentives to emigrate. Consequently, the number of Italians who left the country decreased. At the same time, Italy experienced an economic growth that led to the increase of immigration. From 1971 until the mid eighties the growth of foreign population in Italy has registered a steady trend of 7%. In the 1990s it grew from 500,000 to over 1 million. The turning point was, however, in the mid-2000s, when foreign population doubled, going from 2 million (in 2004) to 4.3 million (in 2010) (figure 1.1).

On January 1, 2011, it was recorded that there were 4,115,235 emigrants³ and 4,570,317 immigrants in Italy⁴. This is 6.8 percent and 7.5 percent of the Italian population, respectively. Moreover, considering the hypothesis about migration flows

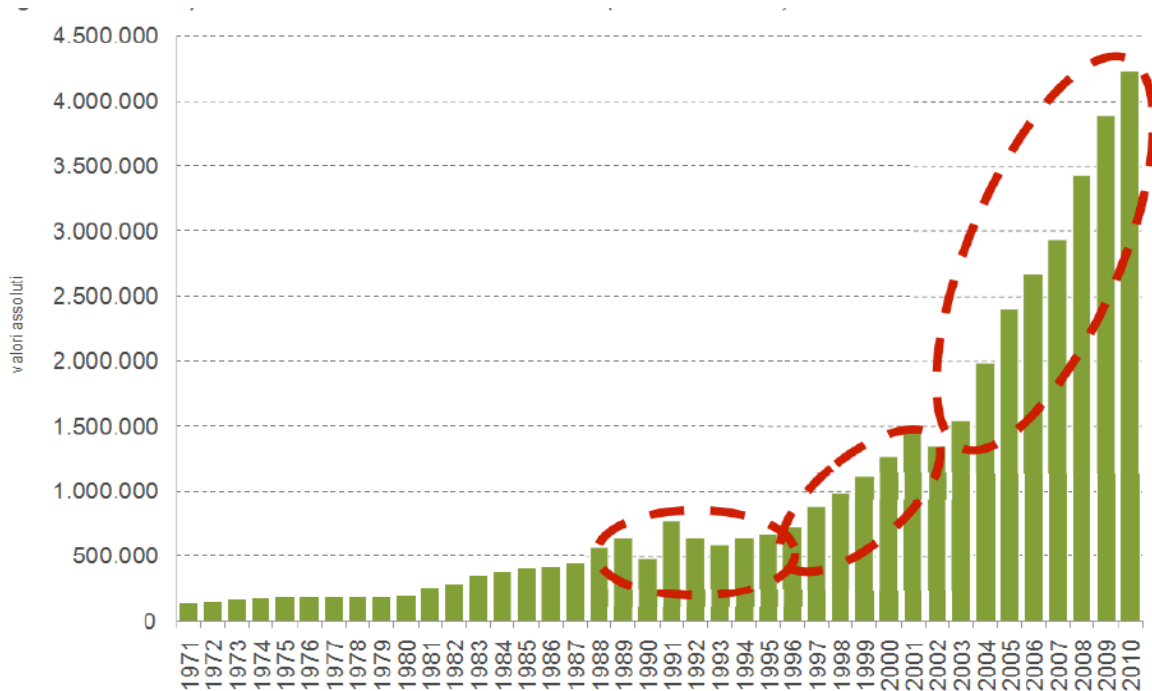
² For a deeper discussion on the Italian emigration, see Del Boca and Venturini (2003), Hatton and Williamson (1998), Livi-Bacci et al. (1996).

³ See “Rapporto italiani nel mondo 2011”, *Idos*, May 2012.

⁴ See the website <http://demo.istat.it/>.

and the reproductive behavior of immigrants and Italians (the former reproduce more than the latter), it is foreseen that foreigners in Italy may substantially increase from 4.6 million in 2011 to 14.1 million in 2065 suggesting that immigration will persist to be a very important economic force during the years ahead⁵.

Figure 1.1 - Foreigners in Italy. Years 1971-2010 (absolute values)



Source: Report 2011 on immigration, Ministry of labor and social policy (Residency permits until 1996 and population from 1997 to 2010; data calculated on 1st of January).

Migration is a difficult issue to interpret, because there are relevant elements which inevitably cross and different “world views” that confront each other, and worse, sometimes even collide. Elements that, other than the “practical” aspect concerning migratory flows, have a human, social, religious, political and economic relevance. Hence, for their own nature, they are of crucial significance.

The present work of research aims to analyze a slice of this articulated universe.

⁵ Istat, “Il futuro demografico del Paese”, Report 2011, 28th of December.

Certainly the increase of migration flows and immigrant population is one of the issues of sociological and political relevance for European countries, but migration also has important economic effects. We will concentrate on one of these facets.

The debate on migration involves many contexts including labor market, national security, combating irregular migration, integration, and development. Most economic studies are focused on immigration's labor market effects for host countries and their welfare, but an important and in some way less explored link is the one with trade.

From the outset, international migration has been understood as an increase of labor force in the host country and it has been studied as such. De facto there exists a remarkable amount of literature investigating the effects of migration on the main outcomes of labor market, such as wages and unemployment rate. Actually, migration is a far-reaching social phenomenon. In recent years, the research, aimed at informing the debate on the role attributed to immigrants in the host country economy's changes, has been expanded by new studies, which consider immigration as an increase of good demand in the host country. Moreover, following many sociologists, demographers and economists, migration has been understood and studied as movement of human capital and not only as simple movement of a production factor. Therefore, the attention of scholars has been broadened to new aspects relative to the recognition that migration is first of all a movement of persons, a move of know-how. In this regard, an issue of growing interest among economists is the impact of international migration on trade between host and home countries. But in what way can migration and international trade be linked? We know that any transaction substantially requires three stages, each of them associated to specific costs which are particularly significant when trade crosses national borders (den Butter and Mosch 2003). These stages are: 1) contact; 2) contract; 3) control. The underlying idea is that migrants may help to reduce the costs associated to each phase of transaction. In the stage of contact, each trader invests resources seeking a partner. This implies costs for obtaining information, communication (generally in other languages), studying the business laws of the other country, etc. Clearly, immigrants who already have business contacts in their home country and/or know the home country law, etc. can ensure that time and costs of the stages decrease. Moreover, after having found the partner, they have to make agreements on the transaction's conditions (price, quantity, quality and delivery). Negotiation on

international markets is affected by discontinuity in legal systems and differences in institutional mechanisms and cultural models. In this phase the trust between the two parts is also relevant. Immigrants may facilitate the match buyers-sellers by going between them. Finally, the agreement must be respected. Partners have to ensure that conditions are followed. The control is more expensive the further the partners are; far in terms of socioeconomic factors (available technologies, cultural and/or linguistic factors) and geographical factors. It is intuitive how migrants are able to reduce these costs thanks to their links with their home country, which virtually decrease such distances.

Transaction costs arising since trade crosses national borders are called international transaction costs. These costs are mainly due to imperfect information (Rauch and Casella, 2003), external environment uncertainty (Anderson and Marcouiller, 2002) and imperfect contract enforcement. This last facet is tied to the fact that if partners are in different countries, local institutions can be unwilling or unable to make the contract enforceable. Since contracts are usually incomplete (because they cannot consider all possible events) partners have a greater incentive of default (Rodrik, 2000).

Ethnic Networks and relation-based businesses, alternative to the market, can help trading partners tear down these costs. In this regard, some empirical studies find that the presence of *networks* (information-sharing groups) increases the volume of international trade (among the earlier studies, Belderbos and Sleuwaegen, 1996; Gould, 1992, 1994; Rauch, 1999; Rauch and Trindade, 2002). In particular, Gould (1994) and Rauch and Trindade (2002) find that these networks have less effect on the volume of trade in the case of homogeneous products, for which market prices are efficient in mirroring relevant information. Instead, they have a significant role for trade in differentiated goods, for which matching between buyer and seller's characteristics is more complicated. This empirical finding raises the question of whether international migration has a higher positive effect on intra than inter-industry trade.

The focus of our research is on the potential relationship between migration and intra-industry trade, in order to investigate whether, as predicted by the network theory, the information shared by migrants really affects trade, in particular trade in differentiated goods, as suggested by empirical literature.

1.2 Goals and Significance of the Study

As said above, the oldest literature on the effect of international migration focused on the effects of migration on the labor market, as it was pushed from the public opinion's worries of a possible crowding-out effect of the native workforce and downward effects on wages and employment. Only rather recently (to the best of our knowledge first studies hail from Gould (1992)) literature has taken a new direction, focusing on the effects of migration on trade. The great majority of studies on the migration-trade nexus have explored the effects of the presence of immigrants on imports and exports of the host country with their respective home countries. They have found that migration has a positive impact on trade, both imports and exports (Rauch 1999, 2001; Rauch and Trindade, 2002; Felbermayr et al., 2010; Caughlin and Wall, 2011; to name but a few).

Broadly speaking, literature has stated that the effect of migration on trade basically acts through two channels: information and preferences. The former positively affects both imports and exports and impacts on the trade transaction costs, decreasing them. The latter, instead, only affects imports and concerns the preferences of migrants for the home country products (Gould, 1992; 1994).

However, the existing literature has not sufficiently stressed the fact that over the years, a change in the trade flows' composition has been registered. In the period following the Second World War, an increase of the share of intra-industry trade, that is simultaneous imports and exports of similar products within a given industry, has been recorded between the countries that are members of the European Economic Community. Since then, the share of intra-industry trade between industrialized countries has continuously grown. In addition, over the last decades, the share of IIT has increased also between developed and emerging countries. For instance, a study by Gaulier et al. (2009) has shown that from 1995 to 2007 a considerable decrease has been estimated in the share of inter-industry trade between European Union countries and Asian emerging economies (from 89 percent to 76 percent). At the same time, the share of intra-industry trade has risen correspondingly (from little more than 10 percent in 1995 to 23 percent in 2007). Specifically, empirical evidence has shown the growing role of the vertical component in trade flows between countries. Indeed, in 2007, again with regard to trade between European Union countries and Asian emerging economies,

trade in vertically differentiated products, distinguished by quality and price, has been much more than horizontal trade in similar products with differentiated varieties (the former amounted to 19 percent, the latter to only 4 percent) (Gaulier et al., 2009).

Looking at these empirical facts leads one to wonder whether these two phenomena, international migration and intra-industry trade, are linked somehow in light of the fact that today more than ever, the structure of trade is characterized by the presence of intra-industry flows for which transaction costs are found to have greater relevance. Hence, the role of immigrants in boosting trade between host and home country, through the reduction of transaction costs, could be more important for intra than inter industry trade.

In this regard, the contribution by Blanes (2005) is pioneering. Blanes must be given credit for having first tried to investigate the link between immigration and trade of intra-industry type in the data. His insight has found evidence for Spain. However, in our opinion, Blanes' analysis does not achieve the best empirical assessment of the issue, since it stops at a first step without making a breakthrough, namely to disentangle the effect of migration on the two components of intra-industry trade, vertical (VIIT) and horizontal (HIIT). This is because the author does not think that there is a different effect on VIIT and HIIT, as he himself states “[...] there are no reasons to expect a different qualitative effect of immigration on horizontal or vertical IIT [...]”⁶.

Unlike Blanes, we believe that migration may affect the two forms of IIT in different ways, since two different mechanisms may act. The underlying idea is that the network effect exerts its influence mainly on the *variety* trade (HIIT); instead, the possible differences in incomes between immigrants and natives activate the *quality* trade (VIIT).

The goal of this work is to put a magnifying glass on this aspect ignored by literature. In particular, the present research is geared towards testing empirically the hypothesis of a different impact of migration on the two components of IIT.

Doing so, we offer a different standpoint of international migration that could help one to look at the new social conditions caused by globalization, with a proactive eye. Moreover, it could clarify that diversity (as combination of natives and immigrants) is a

⁶ Quotation Blanes (2005) p. 253.

source of mutual enrichment because it provides a wide range of opportunities and knowledge, which one has to embrace in order to gain a social improvement.

As already pointed out, a first element of novelty of this study is represented by the separate analysis of the effect of migration on the two forms of IIT, vertical and horizontal.

Moreover, both immigration and emigration are taken into account in the study. Usually only immigration is considered in empirical tests either because very often, emigration data by countries are unavailable (as in the case of Germany) or it is assumed that there are no differences in the effect of inward and outward flows. With regard to this last point, the network theory actually suggests that both emigration and immigration can influence trade and in a different way, due to the potential differences between them (such as historical importance, educational level, etc.). Hence, the relevance of the present research lies in the fact that for the first time different levels are combined. We cross the two dimensions of migration (immigration and emigration) with the two dimensions of intra-industry trade (vertical and horizontal).

In addition, undoubtedly another element of novelty concerns the countries used as testing ground. The subject matter of research has deliberately been done on the two main European countries involved by migration: Italy and Germany. They are two countries which in some ways can be seen as symmetrical. From the migratory flows point of view, it is known that, although in more recent years Italy has become a land of strong immigration, it has historically been a country of emigration. On the contrary, Germany is well-known for being a country of immigration. Therefore they are two different models: Italy is a recent country of immigration, whereas in Germany immigration is a consolidate phenomenon. Hence, it could result interesting to compare them. Moreover, we are dealing with two European countries that have different national dynamics of the labor market. Among the big European countries, Italy and Germany are those which better represent the two significantly different trends characterizing labor market. On the one hand, Germany, together with the United Kingdom, is the country that has absorbed the impacts of crisis better than others; in these countries the labor demand in favor of the foreign component remains constant or even increases. On the other hand, among the Mediterranean area countries, where the crisis has significantly lowered employment levels and a substantial reshaping or a

reduction of the labor demand reserved to foreign population is observed, Italy, together with Spain, also records a low level of working age population and a high level of unemployment, mainly due to the share of foreign workers who have lost their work.

Finally, this work directly links different branches of literature – that investigating the determinants of intra-industry trade with that exploring the relation between migration and trade – offering a rich survey of theoretical and empirical contributions to the explanation of trade (both inter and intra-industry) as positively affected by international migration.

The results of the empirical analysis of the determinants of Italian and German intra-industry trade lend support to the hypothesis according to which migrants may help to increase intra-industry trade thanks to their knowledge about foreign markets and institutions. The interpretation of this relationship is improved when IIT is further divided in its two components, vertical and horizontal, and separate tests are conducted. In fact, the empirical evidence highlights that, when the two different forms of IIT are properly distinguished, the role of ethnic networks in fostering IIT emerges more clearly, supporting the underlying idea of this work that migration differently affects the *quality* and the *variety* trade.

In light of this, it is expected that this thesis will provide a comprehensive understanding of the relevance of ethnic networks in promoting trade in differentiated goods between the home and host country of migration, which will be useful to inform the debate on the potential effects of international migration and guide policy makers.

1.3 Outline of the Thesis

The study is conducted within the conceptual framework of the international trade theory which explains the existence of intra-industry trade between countries.

Chapter 2 reviews the literature on the determinants of the two-way trade and the contributions on the effect of migration on trade in general and intra-industry trade specifically, in order to provide the theoretical framework for the analysis. In particular, after a brief introduction dealing with the traditional theories of international trade, chapter 2 offers a survey of the theoretical models explaining intra-industry trade together with the studies aimed at empirically identifying the determinants of the two-

way trade. Particular attention is given to those contributions that have separately explained the vertical and horizontal product differentiation inside IIT. They have demonstrated the existence of different causes behind VIIT and HIIT and, consequently, the necessity of carrying out separate estimations for them. Then, in such a defined theoretical framework the migration-trade nexus is set, starting from the analysis of the relationship between factor mobility and international trade in the context of trade theories, up to the recent research, especially empirical, that explores the link migration-trade, moving from the Network Theory. Finally a less developed strand of literature, concerning the effect of migration on IIT, has been reviewed.

Chapters 3 and 4 deal with the two empirical analyses realized for Italy and Germany respectively. These chapters present a similar structure. First, they analyze the trends in inward and outward migratory flows and in intra-industry trade flows. Then, in order to verify in the data the existence of a positive effect of migration on IIT and its two components (vertical and horizontal), there are estimated three models characterized by the same explanatory variables (among which the stock of migrants), but with different dependent variables (TIIT, VIIT and HIIT, respectively). The two forms of IIT are disentangled following a procedure widely used in literature, that proposed by Greenaway et al. (1994; 1995), according to which the share of vertical (horizontal) IIT on total trade is obtained when the absolute value of the difference between the export and import unit values is more (less) than a value arbitrarily fixed. After having shown and interpreted the findings of the estimations, a number of robustness checks are provided in the aim of improving the interpretation of the results and therefore the assessment of the analyzed issue.

The two empirical contributions can be located in the literature which focuses on a single anchor country and on the effects of migration on trade between the country under study and its trading partners. Although the basic structure is similar, the two analyses differ with regard to the employed migration data. In particular, chapter 3 provides an analysis of the impact of both immigration and emigration on the Italian bilateral intra-industry trade, by carrying out separate econometric tests for HIIT and VIIT. Instead, in chapter 4, we cannot apply to the German case the same identical line of analysis as for Italy, since, as previously stated, the data about the stock of German emigrants by destination country are not available, in this way precluding the analysis

of both dimensions of migration. However, as we will explain in chapter 4, considering only immigration does not reduce the importance of the study, which, in this case, allows us to conclude anyway that a positive link between migration and IIT exists.

The two studies presented in the remainder of the present thesis, are the outcomes of a long and careful work of research that has led to the construction of two databases. These databases put together data relating to the variables of interest for our research. First, they contain data about immigrants and emigrants for the countries under analysis (Italy and Germany), taken from the respective national institutes of statistics and AIRE (Anagrafe Italiani Residenti all'Estero). In the case of Italy, ISTAT gives data on the stock of immigrants and AIRE on the stock of emigrants, while the Federal Statistical Office of Germany gives stock data only on immigrants and flow data on both immigrants and emigrants. For our purposes, we believe stock data to be more relevant than flow data, since stock data are able to capture the network effect.

In addition, it is worth noting that when studies dealing with the different effects of migration are realized, the outcomes of any study critically depend on how *migrants* are defined. Most existing research studies on the effects of international migration define migrants as foreign-born persons and we do the same.⁷

Data on trade flows have been downloaded from the EUROSTAT web site, conveniently set in order to calculate the indices of intra-industry trade (TIIT, VIIT and HIIT) of Italy and Germany with their respective partner countries and for each studied year. Finally, gross domestic product (GDP), capital and labor data come from the World Bank Development Indicators.

The last part of the thesis, chapter 5, concludes this work of research by summarizing the main findings obtained for Italy and Germany, emphasizing similarities and differences. The chapter also offers some suggestions for further research. For instance, the study of migration-IIT link is here confined to the case of Italian and German trade; further research needs to be carried out to test these results for other countries.

⁷ Anderson and Blinder (2013) offer a wide discussion of alternative definitions of 'migrant' stressing the crucial importance of who counts as a migrant. They observe that definitions of 'migrant' vary among different data sources, and between datasets and law. Among other possibilities, migrants may be defined as foreign-born, foreign-nationals, or people who have moved to a country for a year or more. The authors underline how different definitions have significant consequences for data, both in terms of numbers of migrants (stocks and flows) and for the analysis of the impacts of migration.

Chapter 2

EXPLORING THE DETERMINANTS OF INTRA-INDUSTRY TRADE AND THE ROLE OF MIGRATION.

A SURVEY OF THE LITERATURE

2.1 Introduction

The investigation of the determinants of international trade has brought about the birth and development of several theories. The early theories can be essentially connected to two theoretical schemes: 1) the classical theory (Torrens-Ricardo), which identifies the technological differences between countries as the reason of trade; 2) the neoclassical theory, more general, which simultaneously considers differences in technology, factor endowments and tastes, and which basically is expressed by the Heckscher-Ohlin theory (H-O, thereafter), which underlines the role of relative factor endowments.

The traditional trade theory predicts that, in absence of opposite forces from the demand side, the structure of the exchanges is determined by the technological differences and/or by the differences in the factor endowments. Thus, if the “orthodox” theory was correct, the composition of the trade flows should reflect the traditional comparative advantage. This implies that each country will export the good relatively intensive of the factor relatively abundant in the country, or, the good to which is associated the lowest opportunity cost.

Nevertheless, Leontief (1953), by analyzing the U.S. exports and imports for 1947, noted that USA, which was abundant of capital, mainly exported labor intensive goods and instead imported capital intensive goods. This finding was definitely in contradiction with the H-O theorem.

The Leontief paradox led off a broad debate and copious empirical studies which, for the first time, called into question the importance of the H-O theory.

Furthermore, the traditional theory also forecasts that international trade should occur mainly between complementary countries (namely, between countries with large differences in the relative factor endowments). Trade statistics, instead, notice that most

of the trade occurs between industrialized countries and consists of trade in similar goods (intra-industry trade or two-way trade⁸). The intra-industry trade, together with the Leontief paradox, represented another proof of the inability of the traditional theory to completely explain the real nature of international exchanges.

These empirical facts did not find an explanation in the range of the orthodox theories; therefore, they incited to the development of alternative explanations of the international trade determinants. In particular, the New Trade Theory and the Institutional Theory arose. The former includes those models which are directed to explain the reasons underlying the intra-industry trade and which abandon the hypotheses of perfect competition and/or homogeneity of products. The latter, instead, leaves the hypothesis of identical institutions between countries and recognizes the differences in institutions as a determinant of international trade. Differences in institutions have been identified in terms of information costs (Rauch, 1999; Evans, 2000; Chen, 2004), monetary unions (Rose, 2000), language, national borders, regional trade agreements (Frankel et al., 1998), ethnic networks (Gould, 1994; Rauch e Trindade, 2002) and fixed costs related to contractual incompleteness (Roberts e Tybout, 1997).

The present chapter, in the context of the New Trade Theory, will deal with the theories on the determinants of intra-industry trade and then it will focus on the literature, which explains how ethnic networks can positively affect the trade between countries. Specifically, the remainder of the chapter is structured as follows. The next section deals with an overview of the theoretical and empirical literature on the determinants of intra-industry trade. Section 4 shows the relationship between international labor mobility and movement of goods as predicted by trade theory and as empirical evidence suggests. Section 4 surveys empirical studies concerning the effect of migration on intra-industry trade. Finally, in section 5 concluding remarks are reported.

⁸ The expressions 'intra-industry trade' and 'two-way trade' together with the acronym 'IIT' will be used interchangeably in this work.

2.2 Investigating the determinants of the intra-industry trade. A review of the theoretical and empirical literature

2.2.1 Theoretical literature

The traditional trade theory attributes the role of determining the structure of the exchanges to technological differences and/or to differences in the relative factor endowments. According to this theory, a strong increase in trade flows in the form of *inter-industry trade* should have occurred due to a greater industrial specialization of countries. Empirical data, instead, clearly have shown that what predicted by theory has not happened and rather, the remarkable boost of manufactured products' trade between industrialized countries, that has taken place in the post second world war period, seems to be associated with a despecialization phenomenon (Hesse, 1974; Grubel and Lloyd, 1975; Pagoulatos and Sorenson, 1975).

The term intra-industry trade, or two-way trade, has recently appeared in the international trade theory to define simultaneous exports and imports of goods within the same industry. Moreover, with the advancing of economic integration, trade between European countries has considerably developed. This enhance has been positively considered by the economic literature, since it was an out-and-out augment of intra-EU trade caused by the free trade area, and defined as *trade creation* in order to distinguish it from a "fictitious" increase of trade, facilitated by previous protectionism towards extra-European countries. In other words, also a simple repositioning of trade, so-called *trade diversion*, coming from the substitution of imports from extra-European countries with purchases in the European area, could occur⁹.

The traditional theory cannot explain how a trade can occur within the same industrial sector and between countries similar in terms of factor endowments. In fact, the main EU countries are not particularly different between them in terms of production systems, though there are some sectoral specializations, and, even if initially some authors thought that intra-industry trade simply was the result of a statistical artifice, statistics on trade have shown that almost all goods traded within EU belong to

⁹ The literature has decreed that the cases of trade diversion are limited to agricultural, iron and steel, and textile products, for which protectionism has been very high during the restructuring of the European industries.

the same sectors (Balassa, 1966; Aturupane et al., 1999; Caetano and Galego, 2007; Fontagne et al., 1997; Hoekman and Djankov, 1996; to name but a few)¹⁰.

Hence, the existence of intra-industry trade, together with the Leontief paradox, has represented another proof of the inability of the traditional theory to completely explain the real nature of international exchanges.

Starting from the mid-seventies, the so-called New Trade Theory (NTT, henceforth) has been developed. A key role in the NTT was attributed to find an explanation to the existence of intra-industry trade. Grubel and Lloyd, with their well-known essay of 1975, were the first scholars interested in the study of intra-industry trade in a systematic way. By means of their trade index, they showed that, already in 1967, about 50 percent of trade in manufactured goods, between ten major OECD countries, was two-way trade.

The NTT has had as forerunners a number of studies which developed in the 1960s. First of all, we want to remember those studies which were interested in empirically testing the effects of European Economic Integration. These studies had found that, among the analyzed countries, there had been a simultaneous increase in the exports of goods belonging to the same sectors, rather than a tendency towards specialization in different sectors (Verdoorn, 1960; Balassa, 1961). In addition, the studies that were aimed at introducing as explanatory elements of international trade some important factors ignored by traditional theory, such as technological progress, human capital and income effects, are noteworthy. These contributions abandoned the hypotheses of perfect competition and/or homogeneity of products; they moved the attention from the type of productive structure characterizing each country to other microeconomic variables, such as consumer tastes, presence of scale economies, temporary technological monopoly of who introduces an innovative product on market, etc.¹¹. Moreover, in alternative to traditional models of trade which have given explanations on

¹⁰ For a long time the intra-industry trade's analysis has been subject matter for discussion. The debate concerned, in part, the real existence of the phenomenon. This aspect was strictly related to the definition of 'industry' from an empirical point of view. Finger (1975) and Lipsey (1976) believed that intra-industry trade came out from errors of statistical comparisons, in particular, from a low level of disaggregation of data, which would have led one to consider different industries in the same category and, therefore, to wrongly classify the relative flows as intra-industry trade flows. Following studies have found that the share of intra-industry trade, although decreased with higher level of disaggregation, still remained sizable. Actually, the question is opened, but there is a general consent in using higher level of disaggregation in order to reduce the risk of improper aggregations.

¹¹ In this regard, noteworthy, among others, are the studies by Posner (1961) and Vernon (1966).

the international specialization based on supply's elements, other models, that also consider demand conditions, have been developed. In particular, according to Linder (1961) international specialization derives from differences in the structure of preferences in the domestic markets. The study by Linder has offered a contribution for the identification of comparative advantage sources in the manufacturing industry, by developing the *representative demand* theory. Linder has stated that trade in manufactured goods is caused not so much by differences in supply conditions, but by similarity in demand conditions¹². The basic proposition is that a demand is necessary so that a good is consumed in a country (or used as investment good). Since international trade is nothing else than the extension of a country's economic activity beyond national frontiers, a necessary condition, but not sufficient, so that a product is potentially exportable is that there is a 'representative' domestic demand for this product¹³. The possible foreign demand was not considered sufficient for three reasons: 1) it is unlikely that an entrepreneur thinks to satisfy a need not existing in his own country, since he operates in a world of imperfect knowledge; 2) even if this external need could be perceived, it could be difficult to conceive the suitable product to satisfy this need; 3) finally, even if this happened, it would still be unlikely that in the end this product could be adapted to unfamiliar conditions without running into prohibitive costs. In other words, production functions are not identical in all countries, and, production functions of products demanded in the local market are those relatively more convenient. However, the role of domestic demand does not run out here, since it also determines what products can be imported, therefore, the range of potential exports is identical to (or within) that of potential imports. It follows that countries characterized by similar demand structures will end up producing the same goods and trading between them, whereas countries with different demand structures will produce goods of little mutual interest, and so their trade will be limited. Hence, in order to determine among what countries an intensive trade flow may occur, it is necessary to verify what factors characterize demand structures. Linder has maintained that the most important factor is the average income level: the similarity in average income levels could be used as an index of similarity in demand structures. It can be deduced that differences in per capita

¹² As far as raw materials are concerned, Linder has accepted the H-O thesis.

¹³ Under 'representative demand' Linder has understood the demand for those product characteristics preferred by the majority of domestic users.

income are a potential obstacle to trade. Moreover, according to the author, there exists a strong relation between per capita income and the types of demanded goods, meaning that, as income increases, high quality products will tend to replace low quality products.

According to Linder, trade between countries, with identical demand structure and producing same goods, occurs because there are about unlimited possibilities of product differentiation (real or presumed). In absence of product differentiation, the explanation of comparative advantages will have to be searched in advantages in the processing of raw materials available in huge amounts, technological superiority, managerial ability and scale economies.

The conceptual scheme of Linder, even if lacking of a thorough theoretical formulation (it is useful to explain more the trade intensity than the commodity-related specialization phenomenon, namely, who exports what), has, however, the merit of having proposed an alternative approach to the traditional analysis, and to him the most recent models of international trade, based on the existence of imperfectly competitive markets, product differentiation and scale economies, have been inspired.

Starting from the Linder's model, Barker (1977) has developed a theory aimed at explaining the link between the increase of trade intensity and the increase of countries' real income. By recalling the notion elaborated by Lancaster (1971) in his modern theory of consumer¹⁴, Barker has formulated the thesis according to which when the real per capita income increases, consumers are able to buy more varieties of a product. In his model, Barker has considered two countries with identical factor endowment and same productive and demand structure, but consumers who have different preferences

¹⁴Lancaster (1971) developed a new approach dealing with the consumer choice, according to which there are no perfect substitutes for any two goods with respect to all characteristics and this is obviously in contrast to the standard H-O assumption of product homogeneity. In an H-O world, each producer operates in a perfectly competitive market and so he is a price taker, which means he is not able to fix the price above market level because the product is homogeneous. Instead, when products are differentiated under imperfect competition, each producer is able to set its own price and act as a monopolist because, thanks to differentiation, he is the only one to produce that particular type of product, which is not perfectly substitutable with another one. Differentiation of product may involve branding, styling, labeling and packaging, hence, in this way there exists a segmentation of the market according to consumers' income and preferences. Therefore, according to the new demand theory developed by Lancaster, consumers purchase goods not as such, but on the basis of their characteristics. For instance, when one buys a car, actually, he is buying a set of characteristics such as comfort, safety, speed, etc. variously built-in the several models of a car. Also price can be considered as one of these characteristics. Each consumer has his own utility function and exerts his own choice within a range of differentiated products, understood as products having a different mixture and intensity of a set of characteristics.

for variety and firms who operate in conditions of increasing returns to scale. From this last hypothesis there comes out that whereas in theory each country could produce all possible varieties of goods, actually, in order to take advantage of scale economies, firms tend to specialize in few varieties. It follows that against a rise in the variety demand, supply's variety can be extended only by means of imports.

Barker's model has shown that also when there are not differences in relative productivity and in relative factor prices (namely, do not exist the reasons of trade according to Ricardo and H-O) it is possible to find a reason for international exchanges and gains from trade. This model, as already the Linder's one, is a trade intensity model, not a model of specialization, and it is focused on the product differentiation phenomenon in presence of scale economies.

The relevance of scale economies and their influence on international trade has been studied by several authors, one of which is Melvin (1969). Melvin has analyzed the external economies of scale, at an industrial level¹⁵. This scholar has demonstrated how, given two countries producing two goods, with identical factor endowments, productive techniques and demand structure, in presence of increasing returns to scale in both productions, for each country will be best the complete specialization. In general, this result is reached since a country that, for some reason, initially has large production in a certain industry will incur lower costs of production than competitors, *ceteris paribus*. This circumstance ensures that, with openness to international trade, a self-reinforcement mechanism will take place, namely, a country that produces a good in more convenient conditions, will produce it also in larger quantity, and by doing so, its cost advantage will be further amplified. Therefore, increasing returns to scale drive to confirm the existing inter-industrial specialization pattern whatever the initial cause. Hence, countries which, for some reason head start as big producers in a certain fixed industry, tend to remain big producers in that industry, even if, among international competitors, there emerge late comers, which potentially can produce that good with lower costs. In this sense, external economies strengthen the role of historical accident in determining "who sells what to whom" and can ensure that a pattern of specialization lasts, also when the initial comparative advantage does not.

¹⁵ External scale economies are those connected to industry or sector size. In this case the productivity of each firm does not depend on their own size, but on the size of the sector they belong to, and the biggest firms do not benefit from any advantages with respect to the smallest.

Complete productive specialization will have as consequence the diversification of factor price (which in the original situation of autarky were supposed equal). In turn, differences in factor price will lead to factors' movement towards the country where they will earn more and so relative factor endowments will differ between countries. In the new equilibrium the conclusion of the H-O model, according to which each country exports the goods that use in relatively large extent relatively abundant factors, would be valid. However, in this case in which increasing returns to scale and international mobility of factors are assumed, differences in factor endowments between countries would not be the cause but the consequence of trade.

It is worth pointing out that the phenomenon of specialization and scale economies always more move us away from the hypothesis of perfectly competitive markets. In this regard, there have been developed several models aimed at analyzing international trade in monopolistic competitive markets. The results these models lead to, can be summarized by stating that: a) inter-industry trade is explained by the theory of differences in factor endowments according to which each country specializes in goods whose production requires an intensive use of the factor relatively abundant in the country itself; b) intra-industry trade instead is explained by the model of monopolistic competition with product differentiation and scale economies. Intra-industry trade will be more intensive the more similar the relative factor endowments of countries are, and the smaller the obstacles to trade in terms of duties, transport costs, etc. (namely, as more countries are economically integrated).

On the basis of the nature of product differentiation, in recent years, alongside the main opposition between inter and intra industry trade, the literature on IIT has emphasized the meaningful distinction between vertical and horizontal IIT. Vertical trade concerns trade of products differentiated by quality, whereas horizontal trade refers to the exchange of products characterized by same quality but differentiated attributes. This conceptual distinction is important because theoretical models have demonstrated that the forces driving these two forms of product differentiation are not the same. Dynamics of quality differentiation operate according to an H-O view, based on comparative advantages coming from resource endowments and factors proportions. Product differentiation by attributes is, instead, explained by the typical elements characterizing imperfectly competitive markets.

Initially, most literature has supposed that trade in differentiated products was mainly *variety* trade. Indeed, until the 1980s, the existence of IIT was explained in terms of horizontal trade, by analyzing trade flows between developed countries, which were characterized by similar technology, income and factor endowments, and by assuming the existence of market structures different from perfect competition. In particular, some models have hypothesized that firms worked in monopolistic competitive markets. The models by Dixit and Stiglitz (1977) and Krugman (1979; 1980; 1981) belong to this group. According to these models consumers demand goods differentiated by attributes on the basis of their preferences, and firms diversify production in the aim of satisfying the demand of differentiated goods. In particular, Krugman (1981) has used a Chamberlain monopolistic competition framework and has referred to the Dixit-Stiglitz utility function for modeling the demand side. By introducing in the model scale economies and monopolistic competition, he has found that the volume of trade is independent from the degree of similarity/dissimilarity in factor endowments between countries. Therefore, also similar countries have high levels of trade flows. The second implication of the model is that the IIT index is equal to the index of factor endowment similarity. Then, as much as factor endowments will be similar, all the more, trade will tend to be of intra-industrial type; instead, countries with different factor endowments will maintain inter-sectoral commercial relationships. Krugman has demonstrated that international trade exists because consumers' tastes are deeply different also with regard to the same product and because firms have the chance to concentrate production in one plant in order to exploit scale economies. The first determinant is very important for explaining the 'new' benefit accruing to the consumer, which is not anymore in terms of price, but in terms of available products' variety (so-called love of variety). Consumers appreciate variety as such; this means, at same overall expenditure, their satisfaction level increases as the number of purchased varieties of a certain good increases. Consequently, each consumer demands all existing varieties of a differentiated good. This consumer's benefit has risen with European economic integration since consumers have had at their disposal a larger variety supply (supply by European partners next to domestic supply). The chance that each country specializes in a certain product variety, though in the same productive sector, allows this country to satisfy also the variety demand of other countries. In this way it becomes

relevant the so-called product differentiation: each good as far as equal to others is actually deeply different in regard to its conspicuous or intrinsic characteristics. Therefore, the difference can be substantial (as between a luxury car and an economy car), or purely formal (as between detergents packaged in different containers, either induced by advertising, or attributable to the importance of brand, and so on). As much as countries have achieved the same level of development, all the more it is likely that there occurs a trade in differentiated products, belonging to the same industrial sector (which is exactly what happened between EU countries).

Unlike studies which have assumed IIT mainly being horizontal, Falvey (1981), Falvey and Kierzkowski (1987), Shaked and Sutton (1984), Flam and Helpman (1987) have provided theoretical support to vertical IIT, by elaborating models of qualitative product differentiation. They have illustrated how VIIT has an H-O type explanation. Trade patterns are explained by differences among countries in factor endowments, technology and pattern of income distribution. In particular, Falvey and Kierzkowski (1987) have relaxed the hypothesis that all varieties are produced under identical technical conditions. On the demand side, goods are distinguished by perceived quality. On the supply side, goods are differentiated by the capital-labor ratio used in their production. They have assumed that higher-quality products require capital-intensive production techniques and are associated with higher prices. All consumers have the same preferences, but different incomes. The fact that aggregate income is not equally distributed ensures an aggregate demand for a variety of differentiated products: each person demands only one kind of differentiated good on the basis of his income. Such a defined framework leads to conclude that, as in an H-O view, the country which is relatively capital abundant will tend to export higher quality/capital intensive varieties of differentiated goods (which are demanded abroad by high-income consumers) and to import lower-quality/labor intensive varieties (which are demanded by domestic low-income consumers).

Shaked and Sutton (1984) have explained, instead, the influence of the market structures in VIIT flows in a context of oligopolistic competition, which leads to price reductions of higher quality goods and to the disappearance of lower quality goods. The quality is associated with fixed costs. The demand for each quality of a product depends on the income distribution. Firms face a three-part decision process – entry, quality and

price. In the long run, firms' survival depends on the improvement of the products' quality and on economies of scale, which can lead to the emergence of "natural" oligopolies.

Flam and Helpman (1987) have stressed the importance of technological and income differences between countries in explaining the North-South intra-industry trade structure. They have found that to determine qualitative differentiation is not the amount of capital employed in production (as in Falvey and Kierzkowski's model), but the technology used. Labor input for output's unit of qualitatively differentiated products differs between Northern and Southern countries: the North has a comparative advantage in high-quality products and this explains why it exports industrial products of high-quality (high cost varieties) and imports industrial products of low-quality (low cost varieties) from the South. As said, according to these authors the pattern of IIT reflects differences also in income distribution as well as technology. Their model explains that "Intraindustry trade arises because consumers who have different incomes demand different quality products, and because in a given country the range of produced qualities does not correspond precisely to the demanded range of qualities."¹⁶ As it will be largely explained in the remainder of this thesis, income distribution is expected also to have a relevant role in the relationship between migration and trade, since the potential existence of income differences between immigrants and natives may activate trade flows of qualitative nature.

Rather recently, theory on the determinants of IIT has been extended by the development of models that have highlighted further driving forces of IIT. At the beginning it was believed that the existence of two-way trade could be explained only by theories based on increasing returns to scale and imperfect competition, reaching the conclusion that the more similar trading countries in terms of factor endowments, the greater the extent of IIT. In other words, this strand of theory predicted a negative relationship between comparative advantage and IIT. Extensions of the theory of IIT have led to the wide acceptance that increasing returns are not a necessary condition for this type of trade. Davis (1995), by means of a simple model, has shown that IIT could also occur in a constant returns to scale setting and in perfectly competitive markets, and a relevant role is that of small technical differences between countries, which

¹⁶ Quotation p. 821.

introduce specialization and trade. So Davis (1995) has given an explanation of IIT based on comparative advantage by means of the introduction of elements of the Ricardian trade theory within the Heckscher-Ohlin framework. In particular, the author has stated, “Two characteristics make intra-industry trade precisely such a setting. The first is the very definition of intra-industry trade -trade in goods of similar factor intensity. It is evident that substitution possibilities across such goods in production will be excellent. The second is the emphasis within the intra-industry trade literature on the large number of goods produced and traded. When the number of goods is large relative to the number of factors, some sectors may be expanded and others contracted without rising marginal opportunity cost. Both of these characteristics of intra-industry trade thus suggest the relevance of Ricardian determinants of trade.”¹⁷

In addition, from interesting studies on endogenous growth and the relationship between trade and technological progress (Grossman, 1996; Helpman, 1998), it has come out that human and technological capital have an important role not only for productivity growth, but also for specialization and trade of countries.

Finally, an explanation has also been provided for the relevant role of foreign direct investment (FDI) in IIT, both vertical and horizontal. Falvey (1981) has modeled VIIT and has suggested that capital movement by FDI promotes exports of more capital-intensive goods in developing countries. In Helpman and Krugman (1985) and Helpman (1984), vertical FDI increases intermediate goods trade, involving some related headquarter services to foreign affiliates, such as technology transfer and tacit knowledge on production management. However, the relationship between FDI and VIIT is somewhat ambiguous. Vertical IIT will be positively associated with the presence of inward FDI, if foreign firms combine their technological knowledge with local endowments to produce goods of varying qualities that are then shipped to export markets. If, instead, FDI is mostly directed towards supplying the local market, a negative association between FDI and vertical IIT will be found. In the case of horizontally differentiated products, FDI may substitute for exports of the goods that were previously produced in the investor's home country (Markusen and Venables, 1996). Whether this would reduce IIT depends on the export structure of the industry in the foreign country prior to entry by the multinational. If the industry did not produce

¹⁷ Quotation p. 203.

similar goods or if the foreign entrants have positive net exports, horizontal IIT will increase (Helpman and Krugman, 1985); if, however, investors outsource fragments of their production abroad, horizontal IIT will fall (Deardorff, 1998).

2.2.2 Empirical Literature

2.2.2.1 Studies based on country-specific variables

The empirical analysis of the determinants of intra-industry trade is quite a developed area of international economic research. The large amount of studies can be classified on the basis of employed data, types of variables used in the empirical tests and finally, the degree of refinement of analysis.

Earlier empirical studies have used either time-series or cross-sectional data. Compared to the time-series analysis, cross-sectional data are more consistent and suitable for testing the hypothesized relationships, especially between income per capita and intra-industry trade (Greenaway and Milner, 1984; Greenaway and Milner, 1986; Helpman, 1987; Hummels and Levinshon, 1995).

The hypotheses related to the determinants of intra-industry trade have been tested by employing data at country and industry levels. The country-specific characteristics refer to major features belonging to a country, such as market size, level of income, natural and artificial trade barriers and taste similarity, while the industry-specific characteristics consist of product differentiation (by style, quality or technology), scale economies and, generally, factors related to the market structure. Since the intensity of intra-industry trade for any given industry varies depending on country-specific characteristics of the trading partners and industry-specific characteristics of commodity demand and supply, in many studies both types of characteristics are used as independent variables to explain the share of intra-industry trade in the total trade of a country, in some cases also disentangling vertical and horizontal intra-industry trade (Loertscher and Wolter, 1980; Greenaway and Milner, 1986; Balassa and Bauwens, 1987; Greenaway et al., 1996; Blanes and Martìn, 2000; Leitão and Faustino, 2008; Pittiglio, 2009; Zhang and Clark, 2009).

Among the country-specific variables, per capita income is one of the most widely used determinants. A large part of empirical literature has shown that there exists a

positive link between per capita income and intra-industry trade: the growth of per capita income positively affects the increase of intra-industry trade, in this way supporting the conception by Loertscher and Wolter (1980) according to which as per capita income grows, total demand of each consumer for various products increases (Balassa, 1986; Balassa and Bauwens, 1987; Bergstrand, 1990; Narayan and Dardis, 1994; Somma, 1994; Stone and Lee, 1995; Thorpe, 1995; Nilsson, 1999; Thorpe and Zhang, 2005). This leads to two-way trade of differentiated products. Helpman (1987) has used cross-country differences in income per capita in the aim of exploring how the similarity in factor composition among countries affects intra-industry trade. He has found a negative and significant correlation between the share of intra-industry trade and dissimilarity in income per capita. This means that countries with similar levels of per capita income have an increasing tendency to simultaneously import and export goods belonging to the same industry. The result of a negative impact of differences in per capita income on intra-industry trade is reached also by other scholars (Culem and Lundberg, 1986; Balassa and Bauwens, 1987; Ballance et al., 1992; Somma, 1994; Greenaway et al., 1994; Nilsson, 1999; Blanes and Martín, 2000; Thorpe and Zhang, 2005).

In addition, according to Loertscher and Wolter (1980), the market size, measured in terms of average gross domestic product (GDP), can have a strong positive influence on the share of intra-industry trade. Several studies have supported this result by finding that the larger the market size, the greater the extent of intra-industry trade (Balassa, 1986; Balassa and Bauwens, 1987; Hellvin, 1994; Narayan and Dardis, 1994; Somma, 1994; Veeramani, 2002; Chemsripong et al., 2005; Leitão and Faustino, 2009; Pittiglio, 2009; Shahbaz and Leitao, 2010). In contrast, the trading countries which have large differences in the market size tend to have a small extent of intra-industry trade (Balassa and Bauwens, 1987; Balance et al., 1992; Greenaway et al., 1994; Nilsson, 1999; Blanes and Martín, 2000; Okubo, 2007; Shahbaz and Leitao, 2010).

In their theoretical works, Krugman (1981) and Helpman (1981) have maintained that intra-industry trade occurs mainly between countries with similar factor endowments in terms of the ratio of total capital to the labor force. In other words, intra-industry trade tends to be larger between countries characterized by similar capital-labor ratios, rather than those with different ratios. However, studies which have attempted to

empirically investigate the impact of countries' factor endowments on intra-industry trade have produced contradictory results. For instance, Clark (1993) has found a negative association between the capital-labor ratio and intra-industry trade. Instead, Narayan and Dardis (1994) have found evidence of a positive relationship in the textile sectors. Finally, from the contribution by Hummels and Levinsohn (1995), results arise which differ depending on which estimator is included - OLS or fixed-effects estimators. In the first case, the coefficient of the capital-to-labor ratio is negative, but not statistically significant; in the second case, the factor difference variable turns out to be positive and significant.

Other country-specific characteristics such as natural barriers and trade restrictions are also important determinants of the two-way trade. Natural barriers such as physical and cultural distances between countries are found to have a strong negative influence on intra-industry trade. Usually in empirical studies natural barriers are proxied by language, cultural differences and transport costs measured mostly by the geographical distance between trading countries (Balassa and Bauwens, 1987; Clark, 1993, 2006; Narayan and Dardis, 1994; Hummels and Levinsohn, 1995; Stone and Lee, 1995; Thorpe, 1995; Martin and Blanes, 1999; Nilsson, 1999; Veeramani, 2002; Crespo and Fontoura, 2004; Reganati and Pittiglio, 2005; Thorpe and Zhang, 2005; Okubo, 2007; Leitão and Faustino, 2008; Zhan and Clark, 2009; Shahbaz and Leitao, 2010).

Trade tariff and non-tariff barriers are expected to be negative determinants of the intra-industry trade by the studies of Pagoulatos and Sorensen (1975), Loertscher and Wolter (1980), Kim (1992), Clark (1993), Narayan and Dardis (1994) and Stone and Lee (1995). However, the net effect of trade restrictions remains ambiguous, partly because of the absence of well-defined measurements of trade restrictions.

2.2.2.2 Contributions based on industry-specific variables

Apart from country-specific characteristics, theoretical models of intra-industry trade have predicted that also industry-specific characteristics exert an important influence on intra-industry trade. According to the intra-industry trade theory, the variations of intra-industry trade intensity depend upon commodity-specific demand and supply conditions across industries. This conception can be explained in terms of scale

economies, product differentiation and competition level, which are the main explanatory factors of industry determinants used in the empirical tests.

The first very common industry-specific determinant is the level of scale economies, which is a variable used in almost all of the studies employing industry-specific factors. However, the empirical literature, which has attempted to verify the role of scale economies in giving rise to intra-industry trade, has yielded mixed results. Loertscher and Wolter (1980), Caves (1981), Greenaway and Milner (1984), Balassa (1986), Balassa and Bauwens (1987), Marvel and Ray (1987), Hughes (1993) have discovered a negative and significant relationship between intra-industry trade and proxies for economies of scale. Sharma (2000), instead, has shown a strong positive link between scale economies and intra-industry trade in Australian manufacturing sectors, suggesting that “[...] industries which are able to exploit economies of scale are the industries with the higher levels of IIT” (quotation p. 14). Finally, Harrigan (1994) has found both positive and negative relations depending on what proxy he used to measure scale economies.

As far as product differentiation is concerned, empirical literature has used different indices as proxies for it. One of the well-known proxies used is the Hufbauer index, which is represented by the ratio of standard deviation of export unit values of shipments and the unweighted mean of those unit values. This index represents the coefficient of variation of export unit values in the compositions of shipments among countries. It has been used in the empirical analyses of Pagoulatos and Sorensen (1975), Helleiner (1976), Caves (1981), Culem and Lundberg (1986), Tharakan (1984, 1986), Narayan and Dardis (1994). However, Gray and Martin (1980) have argued that an export unit value index may not represent a reliable proxy for product differentiation since “Unit values are particularly sensitive to changes in the composition of trade within an SITC category and a change in the mix of shipments among nations would provide spurious evidence of product differentiation using the Hufbauer index. Unfortunately, even the most disaggregated SITC category (i.e., a seven-digit level) is too aggregative for such a measure to be reliable.”¹⁸ According to Greenaway (1989) this index should be used as a proxy for vertical and technological differentiation, rather than horizontal differentiation.

¹⁸ Quotation p. 326.

A proxy for vertical product differentiation is that developed by Flam and Helpman (1987) who have considered the relationship between income distribution and population growth. Celi (1999), instead, has employed as proxy for horizontal differentiation the number of 8-digit CN products in 3-digit NACE sectors. Moreover, in the studies of industrial organization, product differentiation has been measured by the advertising-sales ratio. Several authors have used this proxy based on the assumption that advertising expenditure is directly related to the level of consumers' preferences (Helleiner, 1976; Caves, 1981; Kim, 1992; Clark, 1993). However, some researchers such as Caves and Khalizadeh-Shirazi (1977) and Greenaway (1989) have argued that the advertising-sales ratio is helpful only in the analysis of horizontal product differentiation because it consists of a large advertising intensity.

Actually, there is a debate about the most appropriate proxy for product differentiation. In this regard, Greenaway et al. (1995) have suggested that a right way to operate, in order to better explore the forces driving intra-industry trade, should be to analyze the determinants of vertical and horizontal intra-industry trade separately.

Another industry-specific factor often used in the empirical investigations on the determinants of intra-industry trade is the level of competition characterizing a sector. Empirical evidence in some cases seems to support the theoretical models of horizontal differentiation by Lancaster (1980), Krugman (1981), Helpman (1981, 1987) and Bergstrand (1990) and the vertical differentiation model by Falvey (1981) according to which the industries where more firms operate are those which experience higher levels of intra-industry trade. Indeed, Celi (1999) has shown that the estimated coefficient of the variable capturing the competition level of a sector has a positive sign in all econometric models (TIIT, VIIT, HIIT). However, Greenaway et al. (1995) have found that vertical intra-industry trade is positively linked to the number of firms in an industry, while, by contrast, horizontal intra-industry trade arises associated with industries characterized by few firms.

Finally, as discussed previously, on the basis of the existing theory the influence of foreign direct investment (FDI) on both types of intra-industry trade is somewhat ambiguous. However, the evidence is mostly consistent with the prediction of a positive relationship between FDI and both vertical and horizontal intra-industry trade (Fontagné

et al., 1997; Aturupane et al., 1999; Greenaway et al., 1999; Blanes and Martìn, 2000)¹⁹. Only a little evidence supports a negative correlation between FDI on the one hand and intra-industry trade (TIIT, VIIT, and HIIT) on the other (Byun and Lee, 2005).

A certain number of studies have been realized by using either the country-specific determinants or the industry-specific determinants of intra-industry trade (Greenaway and Milner, 1984; Globerman and Dean, 1990; Stone and Lee, 1995; Celi, 1999; Shahbaz and Leitao, 2010). In some cases, both country and industry determinants have been taken into account (Balassa, 1986; Balassa and Bauwens, 1987; Clark, 1993; Hughes, 1993; Narayan and Dardis, 1994; Somma, 1994; Pittiglio, 2009).

The empirical literature generally has found more support for the importance of country-specific variables (i.e., factor endowments, income levels and distance) than industry-specific variables (i.e., scale economies, product differentiation, FDI and concentration). Nevertheless, Balassa and Bauwens (1987) have stressed the crucial relevance of using the two sets of characteristics together since industry and country determinants may interact with one another, offering ideas for new investigations.

Empirical works exploring the determinants of intra-industry trade have been reviewed by Greenaway and Milner (1989). The authors have highlighted the key role of country-specific effects, such as, the level of economies' development, the country size, the degree of taste overlap between trading partners and their participation to trade agreements which promote economic integration²⁰. Actually, industry determinants are also relevant but, as seen, econometric tests have yielded to mixed and less robust results likely due to two main reasons: i) difficulties in selecting proper proxies for market structure variables (i.e. competition level, product differentiation and scale economies); ii) problems related to the construction of a comprehensive econometric specification of the model, due to the presence of several theoretical models explaining IIT.

¹⁹ Fukao et al. (2003) have constructed a model where a crucial factor of VIIT is FDI. They have shown that, in Asia - where VIIT is fairly dominant - quality trade is mainly driven by Japanese FDI.

²⁰ As far as trade agreements are concerned, most empirical studies accounting for European countries have employed the dummy variable EU, which takes the value of 1 if a country is a member of the European Union and 0 otherwise. These works always find a positive relationship between intra-industry trade (both vertical and horizontal) and the EU variable (Gullstrand, 2001; Crespo and Fontoura, 2004; Reganati and Pittiglio, 2005; Pittiglio, 2009, among others).

2.2.2.3 The distinction of vertical and horizontal IIT in empirical works

The studies dealing with the empirical analysis of the IIT's causes can be sorted on the basis of the dependent variable taken into account- total, horizontal or vertical intra industry trade- other than on the basis of the type of employed explanatory variables (industry or country specific).

The early studies (Culem and Lundberg, 1986; Balassa and Bauwens, 1987; Somma, 1994) mainly have focused on the analysis of the determinants of total IIT; instead, subsequently, some authors have concentrated their attention on the two components of IIT, vertical and horizontal, in this way following the clear indication deriving from the theoretical literature's developments. In fact, as discussed above, after the early models of IIT which essentially have explained the horizontal IIT, models of vertical trade have arisen, which have identified new forces driving IIT. The breakdown of IIT into its two components -vertical and horizontal- also helps to overcome the described shortcomings of the empirical tests using industry-specific variables. Indeed, in their seminal work, Greenaway et al. (1995) have argued that the reason for which the estimated coefficients on proxies for scale economies and product differentiation are often insignificant or present the wrong sign and the explanatory power of the estimated equation is in most cases very low, can be due to a problem of misspecification. In particular, Greenaway et al. (1995) have shown that by distinguishing horizontal from vertical intra-industry trade, scale economies result to be a significant determinant of UK horizontal IIT. Therefore, modeling aggregate IIT tends to conceal the true underlying relationships.

Two different approaches have been mostly employed in order to discriminate between the two forms of IIT. The first is that associated with the studies of Abd-el-Rahman (1984), Freudenberg and Muller (1992) and CEPII (1995), the second has been instead developed by Greenaway, Hine and Milner (1994, 1995), built upon the work of Abd-el-Rahman (1991)²¹. Both approaches use the unit values of imports and exports along with a criterion of dispersion (arbitrarily chosen) to deduce the nature of product differentiation within IIT. Nevertheless, they adopt two different notions of trade overlap: according to the first method, both exports and imports are considered to be

²¹ In the present work we apply the second and widely used method. It will be deeply described in section 4 of chapter 3, together with the index used to calculate the share of IIT in total trade.

part of either intra-industry trade or inter-industry trade, on the basis of the 10 percent threshold criterion, independently of the extent of the overlap. The second approach, instead, directly measures the intensity of trade overlap.

Starting from the pioneering work by Greenaway et al. (1994, 1995), other researchers have disentangled the two forms of product differentiation within IIT in empirical data (Greenaway, Milner and Elliott, 1999; Aturupane et al., 1999; Celi, 1999, 2010; Blanes and Martín, 2000; Díaz Mora, 2002; Crespo and Fontoura, 2004; Byun and Lee, 2005; Reganati and Pittiglio, 2005; Thorpe and Zhang, 2005; Okubo, 2007; Pittiglio, 2009). In particular, Celi (1999) has given a further contribution to the empirical literature on IIT by introducing two innovative elements: 1) disaggregation at the product level (8-digit); 2) separate estimation of the two components of VIIT: up-market and down-market. The choice of the author of opting for a higher disaggregation level of data is driven by the firm belief that a deeper degree of disaggregation of trade data is able to supply a more reliable measure of quality differentiation of traded goods. Instead, the separation between VIIT up-market and down market - alongside the main distinction between vertical and horizontal IIT - is helpful to better capture the relationship between factor proportion and VIIT, namely, the link between factor intensity and comparative advantage in the VIIT in an H-O view. In other words, separating $VIIT^+$ and $VIIT^-$ can partially improve the interpretation of econometric results in terms of an H-O explanation of the vertical IIT. Thanks to the introduction of these two innovations, Celi (1999) has found that proxies for market structure and factor proportion are significant and support the large numbers model of vertical intra-industry trade.

2.3 The theoretical literature on the relationship migration-trade

2.3.1 Exploring the relation migration-trade. Substitutes or complements?

We have seen how international trade theory and its empirical tests have developed in a certain way (the birth of the New Trade Theory, the relevance of disentangling vertical and horizontal trade, etc.). Hence, how can we place the migration-trade link taking into account the evolution of the international trade theory analyzed in the

previous section? This paragraph and the followings are geared towards this aim, starting from the first approaches which analyze the relationship between factor mobility and international trade up to those empirical studies exploring the nexus migration-IIT (and its two components, VIIT and HIIT).

The crucial question of whether commodity movements and factor movements are substitutes or complements has been formally examined for the first time by Mundell (1957). In his study *International Trade and Factor Mobility*, by relaxing the assumption of international factor immobility (instead generally chosen by trade economists) and by permitting some degree of factor mobility, he has demonstrated that under the conditions of the Heckscher-Ohlin-Samuelson model, movement of factors may substitute movement of goods. In particular, by taking into analysis the effects on trade of introducing an impediment to a factor movement (specifically, a tax on foreign-owned capital), he has showed that “[...] an increase in restrictions to factor movements stimulates trade”²².

Departing from the contribution by Mundell (1957), the relationship between factor movements and trade has been largely studied in the range of the trade theories. According to the standard Heckscher-Ohlin model (H-O henceforth), the reason of trade lies in the differences in factor endowment. Each country has a comparative advantage in that sector of production in which the abundant factor is more intensively used. So, if a country is relatively capital abundant, in this country the free movement of factors will cause enhance of immigration since in the host country the relative reward of the scarce factor (the labor, in this case) is higher than that in the origin country. This condition attracts other immigrants. As a consequence, immigration increases the supply of the scarce factor of production, and this increase in the scarce factor leads to an expansion of the production in the import-competing sector and a decrease of the production in the export sector (as predicted by the Rybczynski’s theorem) which conveys to a decline of trade. Hence the traditional H-O model predicts a relation of substitutability between migration and trade²³.

²² Quotation by Mundell (1957), p.321.

²³ Venables (1999) has pointed out that this result does not change adding trade costs and/or costs for factor movements.

Nevertheless, several theoretical contributions on trade have argued that if some of the assumptions underlying the H-O model were modified, migration and trade could be complements.

Markusen (1983) has shown that a complementarity relationship can be obtained if one imposes identical factor endowments between countries and relaxes one of the H-O model's assumptions, such as: a) constant returns of scale; b) identical technology; c) perfect competition; d) absence of domestic distortions. Markusen (1983) has referred to a standard 2x2 model and has supposed that a country has a technological advantage over its trading partner in the labor intensive sector and has assumed this is the only asymmetry among countries. The technological advantage in the labor intensive sector explains the higher wage rate of the country with respect to its trading partner. Then if there is factor mobility, there will be an inflow of labor in the country due to the higher wage and this will establish the conditions, in the H-O view, for further trade: the country, which has become an economy relatively abundant of labor, will increase its exports of the labor intensive good. In this way, Markusen (1983) has shown that movement of factors and trade are complements. As this process of complementarity takes place, the factor price converges since the inflow of foreign labor will wipe out the wage advantage due to the superior technology in the labor intensive sector. "But complementarity between such migration and trade does make a difference. It has the important consequence that it takes more labor movements to achieve complete international convergence than would be the case without 'complementary trade'. Indeed, as pointed out by Markusen (1983), complete convergence in the sense of factor price equalization will occur only once the inflow of labor has driven the superior country to complete specialization" (quotation by Felbermayr et al., 2012).

With regard to specific factors models, Venables (1999) has investigated the effects of trade liberalization on factor mobility assuming endowment differences and barriers to trade in goods. The author has found that migration and trade are substitutes or complements depending on the factor in question, its mobility, tendencies of consumption and other conditions.

Developments in trade theory have led to the spread of models with increasing returns of scale (internal and external) which have predicted a migration-trade relationship of complementarity. External increasing returns to scale take place on an

industry level and not in a single firm (Markusen et al., 1995). In these models the hypothesis of perfect competition still holds since each firm is small. In the presence of external increasing returns to scale and free trade each country will specialize in order to gain from the specialization, and the reward of the factor used intensively in the respective sector will rise, giving a boost to factor movement. The movement of factors in turn causes an increase in the output in both countries (due to the increasing returns of scale) and therefore an increase in trade. Internal increasing returns of scale are instead at the bottom of the New Trade Theory's standard model. The 2x1x2 model is characterized by two countries, one factor of production (labor) and two production sectors. One sector of production has constant returns to scale, whereas the other one has internal increasing returns to scale. Krugman (1995) has shown how monopolistic competition along with internal increasing returns to scale determines a situation in which the biggest economy will specialize and will be a net exporter in the sector characterized by monopolistic competition. In this sector the real factor reward will be higher and this circumstance will cause factor movement towards it, leading to a growth in the endowment differences between the two countries. It follows that the reason for trade increases. In this way factor movements and trade are shown to be complements. Summing up, to the opening question "are migration and trade substitutes or complements?" the answer could be: the development of trade theory indicates the transition from substitutability to complementarity. Indeed, the *excursus* above has shown that the endowment-based models, which generally assume identical technologies in all countries, imply substitutability between factor movements and trade. Nevertheless, developments in the theoretical studies explain that other forces trigger international trade beyond endowment differences, like differences in technology or factor movement itself which in this way becomes complementary to trade. Models of the New Trade Theory, incorporating internal increasing returns to scale and monopolistic competition, reject substitutability and rather suggest complementarity between trade and factor movement.

2.3.2 How can migration flows affect bilateral trade?

In the previous section we have analyzed the existing relationship between factor mobility and movement of goods in light of trade theories. What one can note is that most theoretical works focus on the general equilibrium effects and look at the movement of labor as a ‘pure factor movement’ (formally identical to international capital mobility) ignoring that international mobility of labor is *de facto* a movement of ‘human’ capital and, therefore, it should be treated (and studied) as such.

Many sociologists, demographers and economists, looking at international migration as a human capital movement, have underlined the relevance of ‘networks’ (information-sharing groups) for both trade and migration in the range of the so-called Network Theory. Unlike the studies reviewed above, which are mainly theoretical works, those which refer to the network theory are mainly empirical.

Some interesting empirical studies have found that networks increase international trade volume (Belderbos e Sleuwaegen, 1998, for the case of international business groups; Gould, 1994, for migrants). In this regard, the networks of migrants and their effect on trade have obtained specific attention. The underlying idea of the Network Theory is that immigrants’ networks play an important role in reducing international trade transaction costs, those costs that several empirical studies have shown to be a negative determinant of trade as well as an explanation of both border and missing trade²⁴ (Anderson, 2004; Anderson and van Wincoop, 2004). Hence, ethnic networks related to migration would be able to (positively) affect trade through the effect on international transaction costs.

In this regard, it becomes important trying to understand how this connection takes place. Put another way, the burning question is the following: what is the mechanism by which ethnic networks related to migration affect trade? Literature on this issue, having roots in the seminal works of Gould (1992; 1994), substantially has identified two

²⁴ The so-called ‘border trade puzzle’ refers to what Helliwell and McCallum (1995) and McCallum (1995) found in their studies: trade between Canadian provinces turned out to be twenty-two times greater than trade between a Canadian province and an American state, in this way showing that national borders has an important role.

Instead, the so-called ‘missing trade puzzle’ concerns both the already mentioned paradox of Leontief and the paradox found by Trefler (1995) according to which trade volumes are much lower than what predicted by theoretical models. In particular, he finds that relative capital abundant countries (industrialized countries) trade too much among each other and too little with relative labor abundant countries (developing countries).

channels: the *preference* channel and the *information* channel²⁵. With regard to the first channel, Bratti et al. (2012) have noticed that immigrants have habits of consumption different from those of natives, which makes it unlikely that they will be able to adjust quickly. Therefore these habits can be modified only slowly, or rather, time is necessary before immigrants modify their demand in favor of close substitutes supplied by the host country. The just exposed arguments clarify how the ‘preferences’ of migrants for their home country’s goods could cause, at least in the short run, an increase in the demand of goods from their homeland, leading to a raise of imports. So the imports of the host country could enhance due to the increase of demand either of goods already imported and new varieties of goods never imported before.

The second and surely more empirically explored channel, by means of which international labor flows may have a trade-promoting effect, is the *information* channel. It refers to the key role played by migrants in reducing the information costs, that is to say communication costs, costs of obtaining foreign market information, costs associated with the negotiation of trade contracts and the insurance of their enforcement (Gould, 1994), which represent an important component of the fixed costs a firm has to face in order to enter foreign markets. These two channels (*preference* and *information*), also are known as direct immigrant links (Felbermayr, Jung, and Toubal, 2009).

A growing number of studies (Rauch 1999, 2001; Rauch and Trindade, 2002; Felbermayr et al., 2010; Caughlin and Wall, 2011) have focused on the investigation of the information channel, which show how migrants, by virtue of the superior market knowledge that they naturally embody, are able to match buyers and sellers and, doing so, to decrease the transaction costs of trade and promote both imports and exports in the host country.

How can migrants function as “bridge” between home and host country? Relating to Gould’s discussion, we can argue that migrants, by definition, are those who have experience of both locations (origin and destination) and are often bilingual, indeed they know their mother tongue and obviously that of the host country. Moreover, what is relevant in the view of communication costs’ reduction is that also the residents of the receiving country can learn the native language of immigrants by direct contacts with them. This leads to a reduction of trading costs related to communication barriers. Yet,

²⁵ Bettin and Lo Turco (2009) also have tested for technology channel finding that migrants from South contribute to increase the export of labor intensive goods.

migrants have knowledge of products, available either in origin and destination country, and of distribution channels; therefore may help the producers to find the right distributors for their consumer goods in the foreign market, and in this way they may determine, in the host country, a decline in the costs of obtaining foreign market information. Clearly, the benefit in terms of costs' reduction will be greater more differentiated the goods are across countries since transaction costs (like costs related to get information about varieties available in the foreign country) are more relevant for differentiated products than homogeneous products and the matching between the buyer and seller's characteristics is more complicated. Moreover, goods characterized by a low elasticity of substitution are shown to be the most affected by trade barriers (Chaney, 2008)²⁶. Finally, quoting Gould (1994), "[...] because trade often depends on contacts for delivery and payment, the development of trust through immigrants contacts can decrease the costs associated with negotiating trade contracts and ensuring their enforcement." (p. 303)

Rauch (2001) has stressed the relevance of business contacts and social networks in overcoming informational barriers and the other informal barriers to trade. To migrants is recognized an important role, that of being 'information providers' by virtue of their home country's superior knowledge about language, trading opportunities, potential markets and available products, but above all they could already have business contacts with their home country able to facilitate the matching between sellers and buyers. It is worth noting that it is necessary that firms in the host country are able to recognize the relevance of information brought by immigrants and to acquire them so that host country can really benefit from immigration (Wagner et al. 2010, Peri and Requena-Silvente, 2010).

²⁶ Krugman (1980) developed a model with identical firms showing that a higher elasticity of substitution between goods magnifies the impact of trade barriers on trade flows. Due to consumers' 'love for variety', in presence of less substitutable goods consumers are willing to buy foreign varieties even when they have a higher cost, and so, in this case, trade barriers have little impact on bilateral trade flows. Unlike Krugman (1980), Chaney (2008) finds that "[...] the impact of trade barriers on trade flows is dampened by the elasticity of substitution, and not magnified" (p. 1707). In particular, the author develops a model thanks to which, by introducing firm heterogeneity in productivity as well as fixed costs of exporting, it is possible to predict the elasticity of aggregate trade flows with respect to trade barriers to be inversely related to the elasticity of substitution. According to Chaney, the explanation of this relation is related to the presence of new and less productive firms that enter the export market when trade barriers decrease. If elasticity of substitution is high, these less productive firms will have a small impact on aggregate trade since, due to their productivity disadvantage, they capture a small market share. On the contrary, a lower elasticity of substitution ensures that less productive firms will largely affect aggregate trade since now their market share is large.

From the arguments explained above two important observations follow: first, the more dissimilar the economies are (and the smaller the amount of information about immigrants' mother country that host country already has) the larger the potential benefits to trade, deriving from information brought by immigrants, will be (Winter, 2003). Second, trade in differentiated goods will gain from immigrant links more than trade in homogeneous goods (for which market prices are efficient in revealing significant information) (Gould, 1994; Rauch, 1999; Rauch and Trindade, 2002; Bettin and Lo Turco, 2009; Peri and Requena-Silvente, 2010) since, as explained above, informal barriers to trade are greater in the first case (Chaney, 2008).

It is worth noting that an apparent contradiction comes out from these two last observations: the migration-trade link should emerge above all when countries are dissimilar between them (North-South relations), but, in this case, intra-industry trade is less relevant and so also the product differentiation. A way to solve this contradiction could be to disentangle vertical and horizontal components inside IIT.

Finally, next to direct immigrant links, namely preference and information channel, in literature also the effects that ethnic networks can have on trade of two countries they do not pertain have been studied. Ferlbermayr et al. (2009) have defined these effects indirect immigrant links to exactly underline the fact that migrants may affect trade flows of two countries also indirectly, namely even if the two countries represent neither home or host country of the migration flow. In this regard, the contribution by Rauch and Trindade (2002) is emblematic. The authors have shown that ethnic Chinese networks may have quantitatively relevant effects on bilateral trade, essentially through two mechanisms which act simultaneously. First, as the works of Gould (1994) and Rauch and Casella (1998) have suggested, co-ethnic networks provide market information and supply matching and referral services; second, networks can provide community enforcement of sanctions that deter violating contracts behaviors (Greif, 1989, 1993) according to the idea that if a businessman violates an agreement then the entire (and huge) Chinese network will refrain from doing business with him anymore.

2.4 The empirical literature on the migration-trade nexus. A survey

The growing empirical studies on the existing relationship between migration and trade give evidence of a complementarity link (among others, Kohli, 1999; Collins et al., 1999; Mundra, 2005; Bowen and Wu, 2004). Indeed, from these studies it has generally emerged that immigration has a significant positive effect on the trade of host country and, in particular, exerts a larger impact on imports than exports. It is worth noting that this empirical finding indicates that preference effects and information effects are both operating, but it does not say anything about which channel has prevailed.

The pioneering contribution in literature that has paved the way to several papers on the subject migration-trade is undoubtedly that by Gould (1994). In this work Gould has investigated the effects of immigration on trade between United States and 47 trading partners for years 1970-1986, estimating a gravity model and employing the non-linear least square econometric method. He has found that the presence of immigrants has a larger impact on exports than imports. This result could imply that the information which immigrants bring with themselves is able to function as trade promoter (export promoter) more than their preferences for home country's products (import promoter). Moreover, Gould, in order to deeply analyze the migration-trade link has distinguished between consumer and producer goods. This distinction has led him to conclude the presence of immigrants has a larger effect on the trade of consumer goods, probably because, as the author himself has explained, these goods are more differentiated than producer goods, so confirming the presumption that the importance of information increases with the degree of product's differentiation.

Starting from the insight of Gould, several empirical studies have been realized in the aim of verifying the true existence of a factor movement's positive effect on trade. The bulk of these studies, apart from having the same theme, present a similar structure of analysis: most of them focus only on immigration²⁷, although the networks theory clearly suggests both immigration and emigration may affect trade²⁸; moreover, they

²⁷ In this regard, the works of Murat and Pistoiesi (2009) and Parsons (2012) represent an exception. Indeed, these authors have investigated simultaneously the effects of both immigration and emigration on trade, pointing out that the absence of one of them leads to overestimate the relevance of the other.

²⁸ It is needed to observe that the analysis' restriction to the only phenomenon of immigration often is due to the paucity of the available emigration data.

distinguish between differentiated and homogeneous goods and imports and exports trade flows. Within these empirical contributions, most scholars have centered upon a single country and on the effects of immigration on trade between the analyzed country and its trading partners. Several works belong to this group: Head and Ries (1998) have focused on Canada, Dunlevy and Hutchinson (1999), Mundra (2005) and Jansen and Piermartini (2009) have concentrated on US data, Bruder (2004) on Germany, Bryant et al. (2004) on New Zealand, Canavire-Bacarreza and Ehrlich (2006) on Bolivia, White (2007) on Denmark, Partidge and Furtan (2008), Girma and Yu (2002) and Ghatak et al. (2009) on UK, White and Tadesse (2007) on Australia, Tai (2009) on Switzerland, Murat and Pistoresi (2009) on Italy, Hatzigeorgiou (2010) on Sweden.

A more recent strand of empirical literature on the issue has employed a more fine geographical scale of analysis: the regional level. These works, thanks to the availability of more disaggregated data, have taken into account the regional distribution of immigrants and have analyzed how they affect the trade flows between destination regions and immigrants' home countries achieving greater precision in estimation. In this regard we remember studies such as those by Bardhan and Guhathakurta (2004), Co et al. (2004), Dunlevy (2006), Millimet and Osang (2007), Bandyopadhyay et al. (2008), Tadesse and White (2008) which have concentrated on US regions, Herander and Saavendra (2005) which have explored the effects of both state and nation level migrants on US trade, Helliwell (1997) and Wagner et al. (2002) for Canadian provinces, Combes et al. (2005) and Briant et al. (2009) for French regions, Bratti et al. (2012) for Italian provinces, Peri and Requena-Silvente (2010) and Aleksynska and Peri (2011) for Spanish provinces, Hatzigeorgiou (2010b) for the case of Sweden, Hiller (2011) for Denmark.

Most papers reviewed above present similar characteristics in terms of the econometric method they have applied. They have not exploited the panel nature of the data, but have applied pooled cross section to estimate a gravity equation²⁹. There exist other studies (for instance, Bandyopadhyay et al. (2008), Peri and Requena-Silvente (2010)) which instead have used panel estimation: in this way, importer-exporter pair effects are implemented in order to control for unobserved heterogeneity.

²⁹ In this regard Parsons (2012) claims that due to the lack of importer and exporter fixed effects "these studies likely suffer from omitted variable biases" (quotation p.5).

In addition, another strand of literature has investigated the relationship migration-trade between many home and host countries (Hatzigeorgiou (2010a), Egger et al. (2012), Felbermayr and Jung (2009), Bettin and Lo Turco (2009), Parsons (2012)) in order to capture all of those unobserved bilateral factors which could drive the causal effect of migration on trade flows. These scholars have used more complete matrices of bilateral trade flows in their empirical works, since they believe that a consistent estimation of gravity model needs information on the whole set of trading partners for all countries. Hence, they have called into question the robustness of previous findings and underlined the need of being cautious in the interpretation of the previous results deeming that “[...] immigration may be correlated with unobserved factors that also affect trade, such as the trading partners’ cultural similarity or bilateral economic policies [...]” (quotation by Hanson, 2010, p. 253). In this respect, Parsons (2012) has stated “The panel facilitates the implementation of time-varying country fixed effects to control for the common omission of multilateral resistance terms and, crucially, also for country-pair dummies to control for unobserved country-pair heterogeneity.” (pp. 2-3)

Finally, to complete this survey of empirical studies on the nexus migration-trade, it is necessary to mention that branch of literature, although small, that deals with those effects known as indirect trade effects of ethnic networks. It is about the effects that ethnic networks may exert on trade of two countries in which they do not live. The most relevant contribution in this respect is certainly that by Rauch and Trindade (2002) in which it has been investigated the effect of the huge Chinese ethnic network on bilateral trade. The authors have found that “[...] ethnic Chinese networks have a quantitatively important impact on bilateral trade through the mechanisms of market information and matching and referral services, in addition to their effect through community enforcement of sanctions that deter opportunistic behavior.”³⁰

To summarize, the empirical literature reviewed above has found a pro-trade effect of migration, and this effect is statistically significant. In particular, an interesting finding is that immigrants, thanks to the information they naturally embody, have the capacity for increasing trade in differentiated goods more than trade in homogeneous goods (Gould, 1994; Rauch and Trindade, 2002; White, 2007, 2009; Bettin and Lo Turco, 2009). This result implicitly derives from the mere fact that a positive link

³⁰ Quotation p. 129.

between migration and trade has been statistically verified. Indeed, as ascertained by theory, immigrants' prerogatives concern different preferences from natives and larger information on their own home country. Both these prerogatives facilitate trade in differentiated goods (since the importance of information is positively associated with the degree of product's differentiation), hence supporting the underlying idea of the present work that intra-industry trade is affected by migration flows more than inter-industry trade.

Although existing empirical studies largely are in favor of the insight of a positive relationship between migration and intra-industry trade encouraging to explore it directly in the data, to the best of our knowledge, only few works have been realized so far. We will extensively discuss about this issue in the following section.

2.5 The evidence about the migration–intra industry trade link

The basic idea that ethnic networks are able to positively influence trade between two countries (host and home countries), as richly discussed above, is basically relative to the consideration that migrants, thanks to information they bring with themselves, contribute to reduce trade transaction costs. However, if it is true that trade between countries benefits from migrants' informational baggage, consequently it is likely that intra-industry trade will be mainly affected by international migration; in fact, IIT is trade in differentiated goods, for which the informational need about characteristics and quality of products is greater than for trade in homogeneous goods. Moreover, in a previous section (2.3.1) we have argued that the New Trade Theory predicts a complementary relationship; indeed, models of monopolistic competition based on scale economies and product differentiation, which explain the intra-industry trade, suggest that a relation of complementarity between migration and intra-industry trade may occur.

Notwithstanding this, to the best of our knowledge, only few works have been realized so far in the aim of investigating the relationship migration-IIT directly in the data. A first attempt is that by Blanes (2005) who has found that the stock of immigrants in Spain, in the period 1991-1998, contributed to the increase of intra-industry trade

between Spain and its partner countries. Moreover Blanes, by separating manufactured and non-manufactured products, has shown that the former (which are more differentiated) are more affected by the presence of immigrants, confirming in this way the greater impact of migration on intra- than inter-industry trade.

Starting from the seminal work of Blanes, in a following study, Blanes and Montaner (2006), always using Spanish data, have investigated the link between immigration and intra-industry trade adjustments. In their analysis the authors have given additional contributions respect to Blanes (2005): firstly, they have used both industry and country level data for immigrants; secondly, also individual characteristics of immigrants have been taken into account. On the whole, they have found that empirical evidence displays a positive relationship between immigration and marginal intra-industry trade. Specifically, interesting results have been reached by classifying immigrants on the basis of their job position: network effect on IIT acts through people working as managers or in service activities, whereas sales representatives and immigrants in primary activities mostly contribute to enhance inter-industry trade. Furthermore, the authors have distinguished between employees and self-employed foreign workers. They have found a positive and significant sign only for employees and have justified this result by stating that “[...] this implies that ‘personal links’ that form the core of the network approach are more feasible when foreign workers are working for native firms in the host country, whereas self-employed foreigners are more likely to promote only one-direction trade flows.”³¹

Other researchers have focused on immigration in Portugal and the effect that it has on Portuguese intra-industry trade (Faustino and Leitão, 2008; Faustino and Proença, 2011; Leitão, 2013). Also these studies have shown that there exists a positive link between immigration and IIT. Finally, White (2008) and Leitão (2011) have investigated the role of immigration on IIT for US and as well in this case the prediction of a positive correlation between migration and IIT has found support in the data.

We have to point out that, unlike previous studies, White (2008) has given an additional contribution to the empirical literature on the migration-IIT link, represented by the examination of migration effect on the two components of IIT, vertical and horizontal. Specifically, the author expected that HIIT would have been affected by

³¹ Quotation p. 12.

immigration more than VIIT, since horizontal trade is more differentiated than vertical trade and consequently immigrants' preferences would have impacted on the host country import portion of HIIT more than the import portion of VIIT. The results have confirmed what expected: both vertical and horizontal IIT are affected by immigration in US, but estimated coefficients are of greater magnitude for HIIT.

It is worth underlining that although others of the reviewed studies have estimated separately the effects of immigration on IIT and its two components, vertical and horizontal IIT (Faustino and Proença, 2011; Leitão, 2013), finding a positive link with all IIT indices, they have not focused on the explanation of the obtained results. Moreover, none of the here mentioned works has investigated the potential positive effect of emigration, but they have only concentrated on the role of immigration on IIT, running the risk of overestimating its effect. Indeed, also emigration can positively affect IIT and with a different magnitude respect to immigrants, when there exist differences in human capital between them. Therefore, a comprehensive investigation of the effect of migration on IIT cannot overlook the simultaneously relevance of both flows (inward and outward).

2.6 Conclusions

The present chapter has linked two important strands of literature. The first one is that dealing with the theoretical and empirical studies realized in the aim of identifying the determinants of intra-industry trade. We have amply argued as trade in similar [differentiated] goods can be explained basically through monopolistic competition models. There exist a number of monopolistic competition models of international trade, each of them characterized by different sets of assumptions. As a whole, these models consider: i) firms which produce differentiated products with increasing returns to scale technology; ii) consumers with utility functions positively correlated to the product diversity, or in other words, utility of consumers grows up as the available number of product's variety increases. In particular, the early studies have predicted that intra-industry trade is strongly discouraged by geographical distance and trade transaction costs; whereas similarity in factor endowments between countries and market size positively determine IIT. However, a relevant development of theoretical

literature, through the birth of vertical product differentiation models, has underlined that the two forms of IIT, vertical and horizontal, are driven by forces which significantly differ between them: dynamics of quality differentiation operate according to an H-O view (based on comparative advantages coming from resource endowments and factors proportions) and are predicted to be mainly determined by the distribution of income within countries and per capita income differences between countries. Product differentiation by attributes is, instead, explained by elements characterizing imperfectly competitive markets. Hence, empirical tests, aimed at deeply exploring the factors which determine IIT, cannot overlook the distinction between vertical and horizontal trade inside IIT.

The second strand of literature, we have reviewed in this chapter, was about the relationship between international migration and trade. Developments of trade theory have gradually shown the transition from a relationship of substitutability, predicted by the models in which the H-O assumptions hold, to one of complementarity, suggested by the models of the New Trade Theory, based on internal increasing returns to scale and imperfect competition. Actually, it has been pointed out that in most trade models international migration has been understood as a mere factor movement and not as a movement of 'human' capital. In this regard, the key role of networks (information-sharing groups) has been stressed by the Network Theory, which numerous empirical works have referred to.

This more recent strand of literature has positively linked bilateral trade to international movement of people: the last increases bilateral trade between source and destination country of migration. The existing literature on the issue has postulated two ways this enhancing effect might act through. First, the potential bias of foreigners' consumption preferences towards native country's products could cause a demand effect whose direct consequence would be an increase in the imports of the host country. The second and more interesting effect relates to the level and quality of information about foreign markets that migrants bring with themselves. In this literature, immigrants are assumed to have knowledge of their native markets which might reduce transaction costs of bilateral trade and, in this way, positively affect trade between home and host country. The *demand effect* seems to fit more naturally in those cases where there are different varieties of the same product, so that foreigners have a preference (in the

Lancasterian sense) for those varieties produced in their home country. With regard to the *network effect*, its positive effect on the reduction of trade transaction costs could be more relevant for trade in differentiated goods (which theory, as said, has predicted to be more sensitive to transaction costs) than for trade in homogeneous goods. De facto this insight has found support in many studies (Gould, 1994; Rauch, 1999; Rauch and Trindade, 2002; Bettin and Lo Turco, 2009; Peri and Requena-Silvente, 2010).

Nevertheless, that strand of empirical literature which directly link international movement of people to IIT still is at an embryonic stage. Indeed, only few works have been realized in this regard (Blanes, 2005; Blanes and Montaner, 2006; Faustino and Leitão, 2008; White, 2008; Faustino and Proença, 2011; Leitão, 2011; Leitão, 2013). All of these studies have reached results totally in line with what expected: migration has a positive and statistically significant influence on the IIT between host and origin countries of immigration. However, it is necessary to note that these contributions contain some weaknesses. On the one hand, they consider only one dimension of migration (immigration), ignoring the further potential positive effect of emigration that, as the network theory clearly suggests, could have a relevant role, above all if there exist differences between immigrants and emigrants, such as education level and/or countries involved by migration. Indeed, if human capital is different between immigrants and emigrants, they can have different [positive] effects on trade, namely they activates trade, but the effect is higher or lower, for instance according to the ability of migrants of transferring that information relevant for host country and able to positively affect trade costs. On the other hand, these empirical researches, except in few cases and not in an in-depth way (White, 2008; Faustino and Proença, 2011; Leitão, 2013), do not take explicitly into account the two forms of IIT (vertical and horizontal), whose relationship with international migration should be explored separately in the light of the fact that vertical and horizontal trade can be differently influenced by migration. As we have already pointed out, the underlying idea is that the likely existence of income differences between immigrants and natives can affect the quality trade, whereas sharing information about the foreign country should have effect on the variety trade. Therefore, different effects on the two components of IIT are expected. In this regard the empirical studies presented in the remainder of this work are innovative, since they investigate separately the effect of migration in presence of vertical and

horizontal product differentiation in order to deeply investigate the relationship between migration and IIT and give a more reliable assessment of this issue.

After this overview of the studies on migration-trade nexus, how can we locate our two contributions in the existing literature? Our empirical works belong to the group focusing on a single anchor country and on the effects of migration on trade between the country under study and its trading partners. In particular, the next chapter provides an empirical analysis of the impact of both immigration and emigration on Italian bilateral intra-industry trade, by carrying out separate econometric tests for HIIT and VIIT. The element of novelty of our study is an investigation conducted by crossing the two dimensions of migration, immigration and emigration, with the two dimensions of intra-industry trade, vertical IIT and horizontal IIT.

Chapter 3

THE MIGRATION-TRADE NEXUS IN THE PRESENCE OF HORIZONTAL AND VERTICAL DIFFERENTIATION.

THE CASE OF ITALY

3.1 Introduction

Over the last twenty years a vast literature, especially empirical, has been developed in order to analyze the impact of migration flows on international trade under the hypothesis that ethnic networks play a key role. The basic idea is that immigrants are connected to their home countries by various types of links, including: knowledge of home institutions, available products, home-country markets, languages and preferences. International trade can be influenced by immigrants' ties to their home countries, because these linkages could help to decrease trading transaction costs. (Gould, 1994; Head and Ries, 1998; Dunlevy and Hutchinson, 1999; Rauch, 1999, 2001; Girma and Yu, 2002; Wagner et al., 2002; Bruder, 2004; Mundra, 2005; Jansen and Piermartini, 2009; Murat and Pistorresi, 2009; Peri and Requena-Silvente, 2010; Aleksynska and Peri, 2011; Egger et al., 2012; Bratti et al., 2012; Parsons, 2012; Felbermayr et al., 2012, to name but a few).

However, the great bulk of the literature has not remarked sufficiently that, in order to deeply explore the relationship between migration and international trade, it becomes noteworthy to take into account the nature of trade flows. In other words, an accurate analysis of the migration-trade nexus requires the crucial distinction between inter-industry and intra-industry trade flows, and the further separation of vertical and horizontal components inside intra-industry trade (IIT, thereafter). In fact, the theoretical literature on IIT's determinants - see Krugman (1979, 1980), Helpman and Krugman (1985), Balassa (1986), Falvey and Kierzkowsky (1987), Flam and Helpman (1987) - shows that transaction costs are a negative determinant of the share of intra-industry trade in total trade, since changes in transaction costs have a stronger impact on trade in differentiated products than in homogeneous goods. This theoretical prediction

finds support in the data. Indeed, several empirical studies reach the conclusion that trade transaction costs are diversely important for the different types of products. For instance, Rauch (1999) shows that differentiated goods benefit from a reduction of international transaction costs more than homogeneous goods. Gould (1994) finds that the additional information which immigrants bring with themselves, and the consequent reduction of informational barriers to trade, can have more value for consumer manufactured products than producer goods, since the former are more differentiated across countries.

Therefore, if immigration allows a decline in trading transaction costs, this reduction will have a larger positive effect on the volume of intra-industry trade than on the volume of inter-industry trade. The further observation that transaction costs could affect product differentiation in different ways - depending on the type of product differentiation involved, vertical or horizontal - induces to explore the migration-trade link by discriminating vertical and horizontal components of IIT; whereas the former concerns trade in commodities differentiated in terms of quality, the latter refers to trade in commodities that are similar in terms of quality but differentiated in terms of product attributes. Actually the literature on IIT has largely demonstrated that theoretical explanations of vertical intra-industry (VIIT, thereafter)³² differ significantly from Krugman style models of horizontal intra-industry trade (HIIT, thereafter), and consequently, empirical tests on the industry specific determinants of IIT should be carried out separately for VIIT and HIIT (Greenaway, Hine and Milner, 1995). In analogy with these prescriptions of IIT literature, empirical tests on the migration-trade nexus should be performed independently for VIIT and HIIT. On the one hand, the pro-trade role of immigration, in terms of transaction costs reduction, seems more appropriate when HIIT is involved, because the immigrants' knowledge of home country markets and available products should enhance more "variety trade" than "quality trade". On the other hand, growing income differentials between immigrants and natives should activate more VIIT.

This last observation calls into question the relevance of differences in human capital endowment between trade partners and between immigration and emigration flows. Usually, in theoretical frameworks analyzing the migration-trade link, no

³² Models of vertical IIT are provided by Falvey and Kierzkowski (1987), Shaked and Sutton (1984), Flam and Helpman (1987).

distinction is made between immigrants and emigrants with reference to their pro-trade role (Gould, 1994). In addition, in empirical contributions testing the relationship between migration and trade, the nexus is explored by considering the exclusive role of immigrants (except in some rare studies in which the role of emigrants is explicitly explored; see Murat and Pistorisi (2009) and Parsons (2012)). Nevertheless, in the presence of human capital differences between immigrants and emigrants, an in-depth analysis of the migration-trade nexus should not overlook the distinction between emigrants and immigrants, given that their influence on trade flows - and on the nature of trade flows - is virtually different. Furthermore, an investigation of the pro-trade effects of migration, carried out separately for immigrants and emigrants, turns out to be particularly significant when also the nature of trade flows is explicitly considered (disentangling HIIT and VIIT). Hence, an analysis conducted by crossing the two dimensions of migration (immigration and emigration) and the two dimensions of intra-industry trade (VIIT and HIIT) provides a richer set of information by improving the interpretation of empirical results.

Following this line of argument, the present work investigates the existing link between migration and intra-industry trade. In particular, three major questions are addressed here: 1) Does migration help to increase intra-industry trade? 2) Does migration have a different impact on vertical and horizontal intra-industry trade? 3) Do the trade effects of immigration and emigration have different magnitudes? We try to answer these questions focusing on the Italian case which, in our opinion, seems to be the right country for this type of analysis: it was a land of emigration and has also become a land of immigration over time, and the share of its bilateral intra-industry trade has increased in the early twenty first century (from 44% in 2000 to 47% in 2010) together with migration flows. Moreover, Italy lends itself to the separate analysis of the two components of IIT, since, especially for Italy, the “quality” trade (VIIT) represents the predominant amount of all IIT (63% in 2010). Furthermore, the Italian outward and inward flows of migrants, other than a different historical importance, are dissimilar because of countries from which they come, or to which they go; and they differ in educational level too. Italian emigrants mostly go to developed countries, whereas immigrants in Italy are coming from developing countries. This circumstance -

supported by other sources of information (Fondazione Migrantes)- indicates that Italian emigrants are mostly more skilled than immigrants arriving in Italy.

The present work fills the gap in literature, focusing on the Italian case, which moreover represents a novelty of this analysis as there is no other study like this one for Italy. Two rather recent works, Bratti et al. (2012) and Murat and Pistoresi (2009), have investigated the link between migration and total trade using Italian data (provinces-level and country-level data, respectively), but they do not explore the link with intra-industry trade, as we do. Indeed, the literature on migration and trade is fairly developed, whereas the literature dealing with migration flows and intra-industry trade is still rather scarce. A first attempt to explore this linkage empirically comes from Blanes (2005), who, using Spanish data, shows that the stock of immigrants in Spain has a positive effect on the share of its bilateral intra-industry trade. However, Blanes does not take account of the distinction between VIIT and HIIT in the analysis of migration-trade nexus, as we do. Unlike Blanes (2005), the present work carries out a separate econometric test for HIIT and VIIT, in order to improve the interpretation of empirical results deriving from the analysis of migration effects on intra-industry trade.

In our study on Italy, we use country-level data that combines the Italian bilateral intra-industry trade indexes, and both the stock of immigrants coming in Italy and the stock of Italian emigrants by countries, for the period 2005-2010.

Then, following the methodology proposed by Greenaway, Hine and Milner (1995) and based on the unit values of imports and exports as proxies of quality, the intra-industry trade has been divided in its two components, horizontal and vertical, in order to check which one is more affected by migration.

The empirical model, built starting from Hummels and Levinshon (1995) and Loertscher and Wolter (1980), is developed by adding to the basic specifications our key variables: the stock of immigrants and the stock of emigrants. Since intra-industry trade index varies between 0 and 1, the method of ordinary least squares (OLS) is not appropriate and cannot be directly used for the model's estimate (estimated coefficients would not be efficient)³³. As the literature suggests (Balassa, 1986), in order to overcome this problem, we apply a logistic transformation to IIT index and then we use OLS to estimate the model.

³³ On this regard, Caves (1981) noted that OLS method has the disadvantage of not ensuring that predicted values of the dependent variable will be within its feasible range from 0 to 1.

The estimation's results suggest that our hypotheses are consistent with the data: both emigration and immigration exert a positive influence on the share of intra-industry trade between Italy and its partner countries, even if the coefficient of the emigration variable is not statistically significant in all regressions (it becomes statistically different from zero only with reference to HIIT, confirming in any case the relevance of disentangling VIIT and HIIT in empirical tests). This result could be related to the fact that immigrants mostly come from developing countries which represent dissimilar economies with respect to the Italian one so that the information brought by immigrants is more valuable (in terms of trade transaction costs' reduction) than the information carried by Italians going to developed countries.

With regard to the VIIT and the HIIT, we find that the discrimination between these two components of IIT leads to a deep investigation of the link migration-IIT and improves the interpretation of empirical results, suggesting that migration has different effects on the two types of IIT. Indeed, the estimated coefficients and the impact on the VIIT and HIIT are quite different. In particular, the effect of immigration and emigration on international trade turns to be more relevant and significant when the "variety" trade (HIIT) is explicitly considered. Therefore, not to separate IIT in its two components leads to underestimate the potential effect of migration on IIT since it rules out the notable effect on the horizontal intra-industry trade.

These results seem encouraging, in particular in light of the fact we used a very highly disaggregated data and, unlike other studies, our calculations are based on a dataset where both manufacturing and non manufacturing industries are included.

The structure of the chapter is as follows. The next section is concerned with the history and characteristics of both emigration and immigration in Italy and also it focuses on the Italian intra-industry trade patterns. Section 3 presents the econometric model. Sections 4 and 5 discuss the regression analysis' results and finally, in section 6, some concluding remarks and suggestions for further research are provided.

3.2 Migration flows and intra-industry trade's trends in Italy

3.2.1 History and characteristics of the Italian migration flows

Among the industrialized countries, Italy is the nation which has historically contributed the most international flows of people, with almost 30 million expatriates (people living in a foreign country) since the Unity of Italy until today. Of these 30 million, 14 million emigrated from 1876 to 1915. In 1913 around 900,000 Italians emigrated, crossing the ocean in boats, going to Europe by train or on foot. The exodus from Italy has also characterized the period after the Second World War, which was the time of exchange policies (emigrants against raw materials) in order to decongest, in Italy, the mass of unemployed people and to ease the social and political tensions in a difficult phase of recovery. At the time, emigration was considered a collective effort to remedy the structured evils of the Country. Initially, the existing flows were annually over 300,000 units, and after having contributed to the Italian well-being of the fifties and sixties, emigration began to decrease in the seventies and returned to normal in the following decades.

In 1973 the prevalence of people coming back to their native country is recorded as the effect of a heavy economic slump on a European level with the slowing of emigration and the beginning of foreign immigration to Italy. To the traditional ethnic groups coming from North Africa, often on a temporary basis, a new migration of permanent (essentially housemaid) workers entered Italy from the Philippines, Capo Verde and Sri Lanka. In the 1980s, immigrants coming from Central Africa, South America, the Indian sub-continent and Asia settled permanently in Italy. The more recent wave of immigration took place in the 1990s. It started in 1991 with the dramatic outflow from Albania and became even more numerically relevant with the fall of the Berlin Wall and the entering of Poland, first, and Romania, afterwards, in the European Union. Hence, in the early 2000s the situation turned out to be changed: “the big phase of immigration” began in Italy. In 2010, Italians out of the country were 4,115,235 and

the foreigners who regularly remained were 4,570,317 (the foreigners amount to 7.5% of the population, namely, 52 times more than in 1861).³⁴

The number of immigrants and emigrants is not the only thing that has changed over time. The destination and origin countries of migration flows changed as well. The Italian emigration to the Americas has been the first and one of the biggest mass emigrations of Italians. Emigration to the Americas took place from nineteenth century to mid-twentieth century and is a migratory phenomenon that involved entire family units. When emigrants left, they had the knowledge that their destination was very far from home and knew that they needed the psychological support of their own family. Italian emigration to the Americas involved mostly Argentina, where the government gave some free land on which to grow crops. However, after Argentina's economic crisis of 2001, many Italians, who were living there, decided to return to Italy with the small savings they earned. The Italian emigrants in Brazil, instead, dedicated themselves to commerce and conserved a beautiful relationship with other emigrants and with their home countries. In the United States the situation was different. The country was much more industrialized and offered to emigrants a different trade. Today there are many restaurants and pizza places with Italian origins spread throughout USA, restaurants and pizza places that have been passed down from father to son. After the Second World War, the destination of Italians was no more the Americas, but Europe. Everyone had lived through the horrors of the war and was devastated socially and psychologically. Italy left the conflict destroyed, with many of its youth mutilated or killed, and those who remained were left without work. The economy slowly advanced and the South remained further behind. In Europe, however, the situation was different. France, Belgium, Austria and Switzerland were continually making progress and Germany had a large desire to redeem itself. In this way the German industry continued to accelerate, requiring more and more manpower which resulted in hundreds of young people leaving their countries in search of fortune, to improve living conditions and escape poverty.

This increasing emigration to European countries has kept persisting until the present day.

³⁴ One should consider that irregular inward flows in the UE yearly amount to half million. In Italy, in 2005, 10 percent of immigrants cross the sea; 15 percent cross the border, whereas the remaining $\frac{3}{4}$ come in Italy with a regular entry visa and remain beyond the expiration date (Caritas/migrantes, 2005).

In 2010 the top three destination countries of Italian emigrants, put in the list of ten, are Argentina, Germany and Switzerland followed by France, Brazil, Belgium, United States, United Kingdom, Canada and Australia (graph 1).

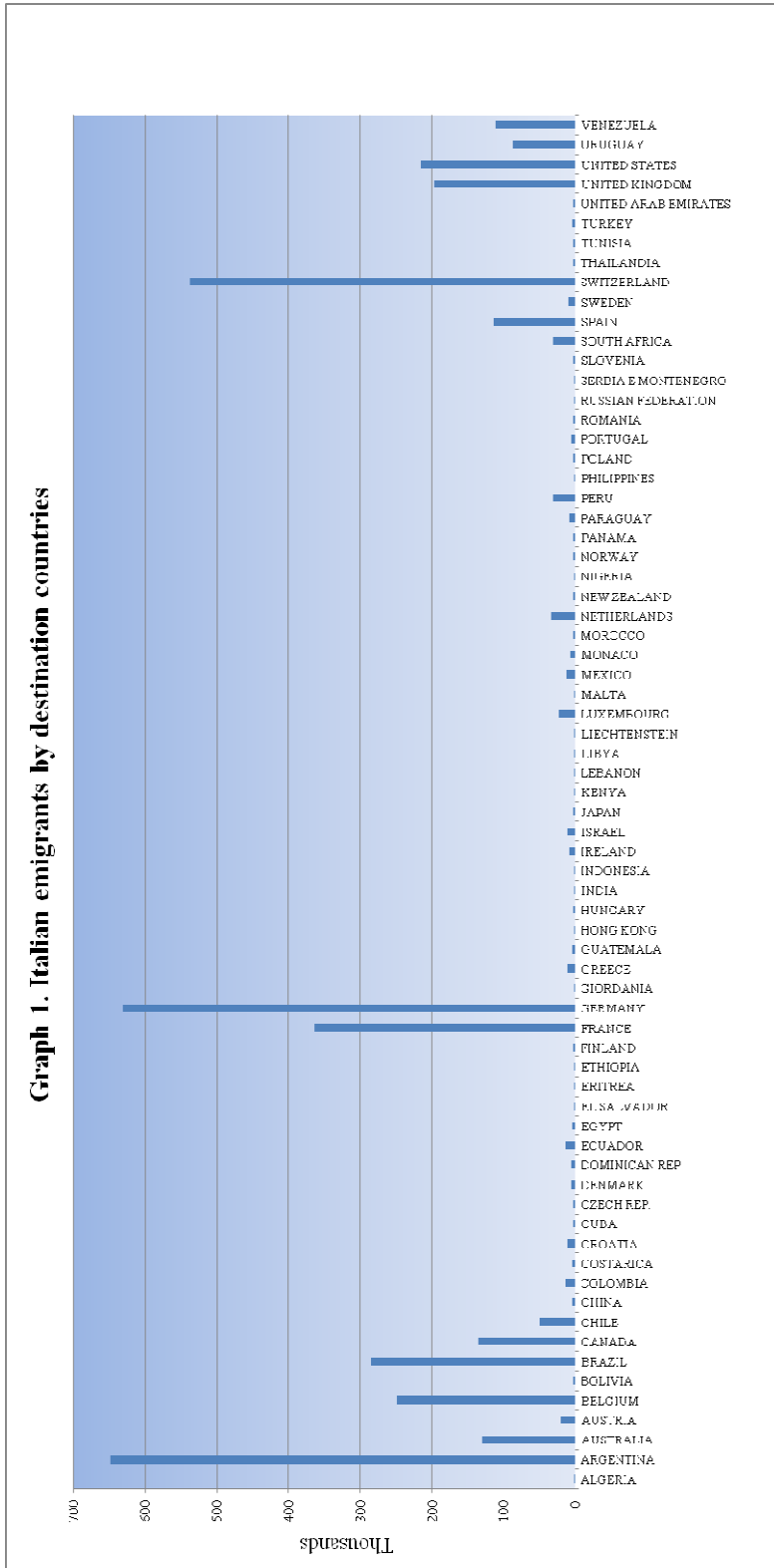
With reference to the continental division, Europe is the chosen destination from 55% of emigrants, South America from 30%, North America 10% Oceania 3%, Asia 1%, and Africa 1% (graph 2).

On the side of immigration, the largest part of immigrants comes from Romania, Albania and Morocco followed by China, Ukraine, Philippines, India, Poland and Tunisia. Therefore Italy is receiving intense flows of immigrants from poorer countries compared to those that in the past were reached by Italian migrants (graph 3).

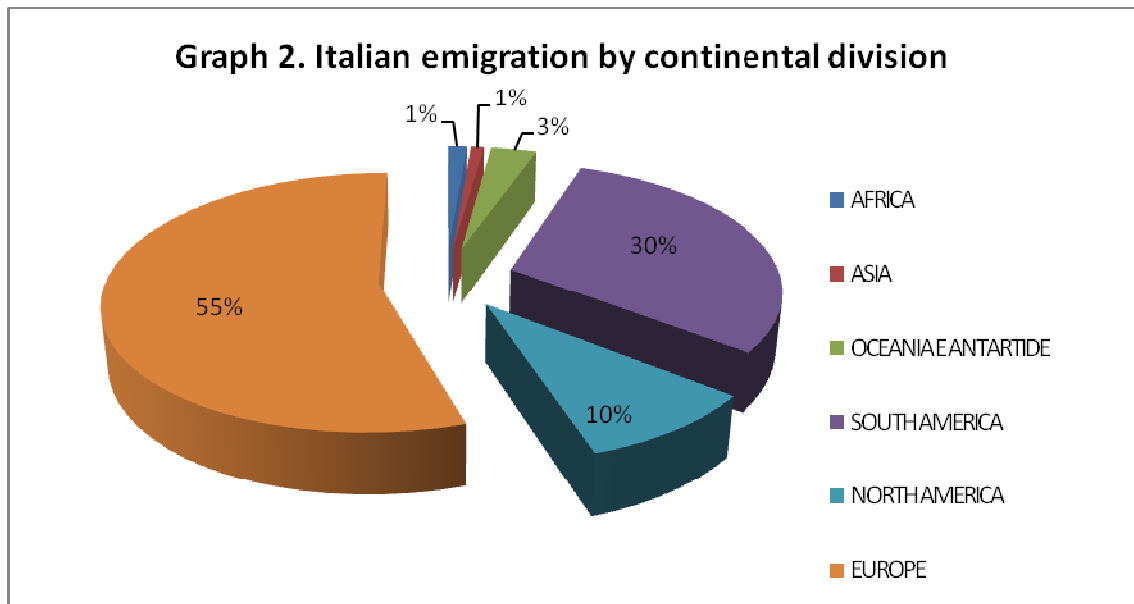
In order to better understand how the country's entering and exiting flows may affect bilateral trade between the sending and receiving countries, it becomes also relevant to analyze how the flows themselves have changed over time. Regarding the figure of immigrants, it is necessary to note that they are far from ignorant. On average, they are in fact more educated than Italian residents. This comes out from the census of 2001 (ISTAT). The foreign residents with a college degree amount to 12.1% of immigrants while only 7.5% of Italians have a degree. 27.8% of foreigners have a diploma against Italy's 25.9%. Those with a middle school license amount to 32.9% against Italy's 30.1%. This fact probably astounds since, in almost all of the cases, immigrants dedicate themselves to jobs such as caretakers, janitor, and other jobs that sometimes are far from their educational and professional background. This trend is known as "brain waste" and is widespread in Italy.

As far as emigration is regarded, a new type of emigrant has taken form. The traditional emigrant who was generally poor and low in culture, who was satisfied with humble working conditions and being underpaid, has been placed side-by-side with different types in the last 15-20 years. In this regard we mention the professional emigrant who moves not necessarily in order to find a job, but to enrich its own amount of experience, or the student who, after a period of time spent abroad, decides to remain in that country, or lastly "the Brain" which is a searcher who cannot get the desired opportunity in an Italian University and is forced to move abroad. All of them are qualified, capable, and generally obtain professional success that perhaps in Italy would have been impossible. Therefore, new emigrants are often qualified people employed by

research centers abroad, multinational companies, or in transfer for their firms. In 2001-2006 there was an increment of college graduates subscribed to AIRE of 53.2%. Nevertheless, unlike the new generation of European migrants, the Italian one is still characterized as having a quota of less educated migrants (Braun and Arsene, 2006).



Source : author's calculations based on AIRE data.

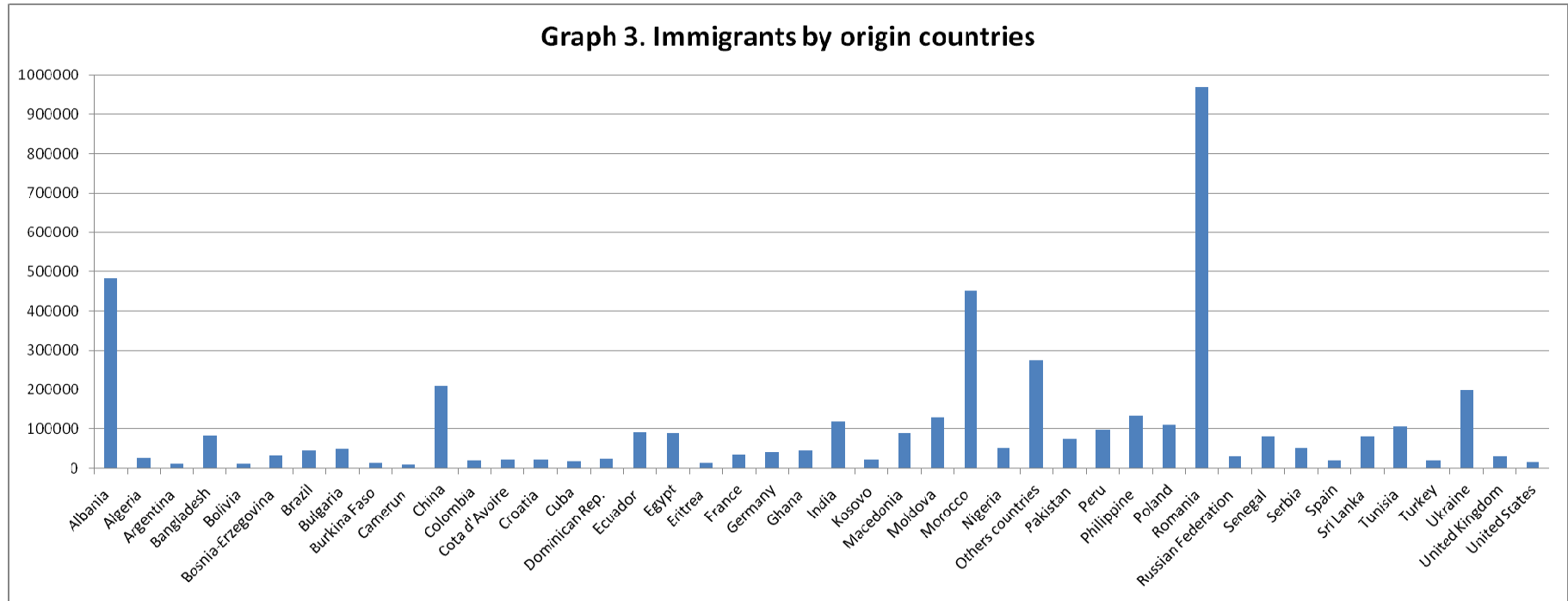


Source: author's calculations based on AIRE data.

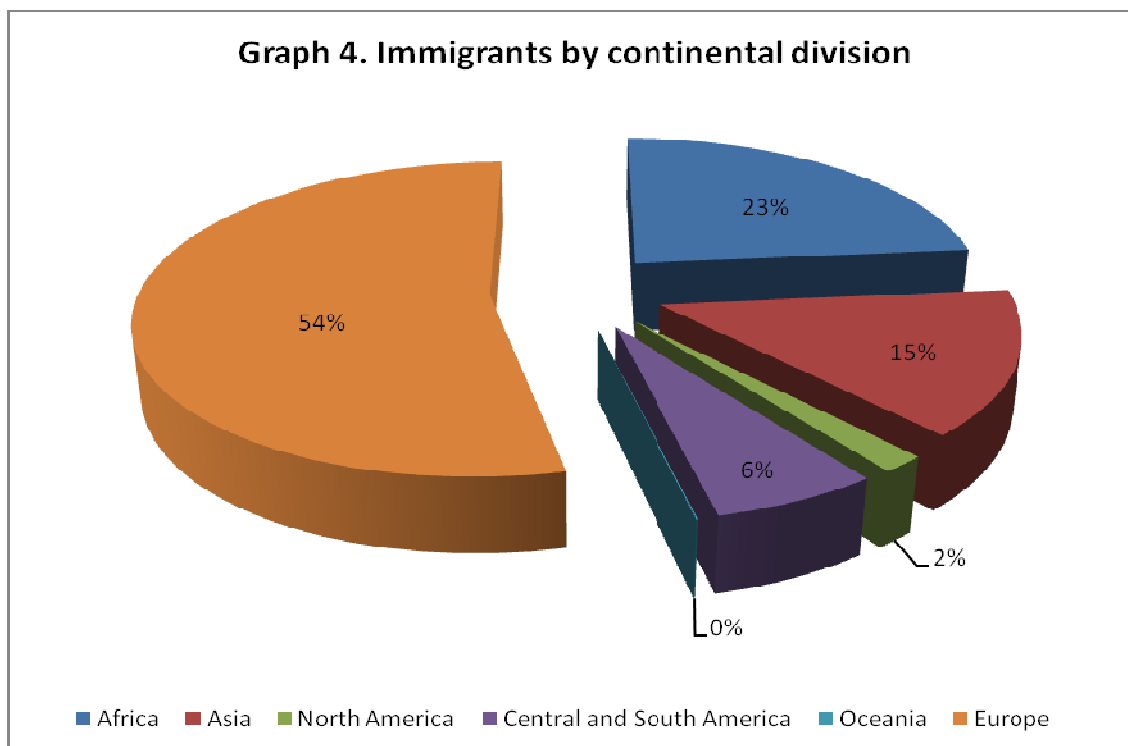
However, one can positively conjugate emigration with globalization by proposing it as an innovative force. There are about 14 thousand firms abroad founded by Italian entrepreneurs who represent a resource for the Country: precious consultants, able to supply a valid support in terms of information³⁵. In addition, it is worth noting that the Italians that have a permanent and stable residence abroad continue to maintain a strong bond with their culture, which in turn, may assure the benefits of a return emigration (not necessarily in the physical meaning). In this sense, emigration constitutes an opportunity for Italy, and the actions promoted by Italian government to facilitate and strengthen contacts between Italians and their compatriots are noteworthy. In the month of April 2012 the ministry of foreign affairs planned to create a web platform (crowdsourcing) that involves 22 adept scientists who serve ambassadors and consulates who, in the end, will allow the ex-patriot talents to stay in contact with Italy. This has been thought as a way to contribute to the overcoming of the crisis and to the economic growth of the Country. In particular, the ties with the Italians abroad can help to boost intra-industry trade between Italy and the destination countries of migration.

In this regard, the next section describes the main characteristics of the Italian IIT (e.g. what type of product differentiation predominates and its trend over the last years).

³⁵ Fondazione Migrantes, *Rapporto italiani nel mondo*, 2006.



Source : author's calculations based on AIRE data.



Source: author's calculations based on ISTAT data

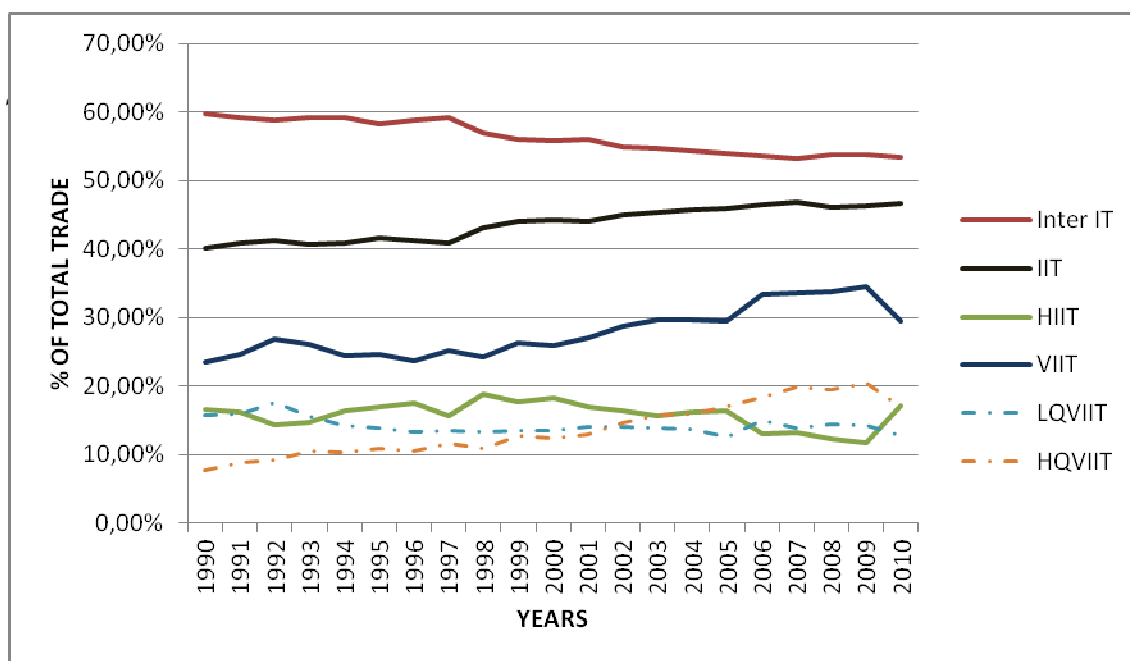
3.2.2 A glance at the intra-industry trade pattern of Italy

Over the years 1990-2010 Italy's share of intra-industry trade, in total trade with 68 partner countries, grew from 40% to 47%, particularly in the share of vertical intra-industry trade. Graph 5 shows the trend in the aggregate indices of the Italian IIT with the countries in the sample for the period 1990-2010. What we can infer is that Italy's intra-industry trade with the considered countries is mainly trade in goods differentiated by quality: on average it accounts for more than 60 percent of total IIT in the period 1990-2010. Specifically, vertical trade of higher quality (HQVIIT) has increased up to 57 percent on total vertical IIT in 2010³⁶.

³⁶ Vertical IIT is assumed to consist of two components, high-quality (HQVIIT) and low-quality (LQVIIT). When the share of HQVIIT is high it implies that a country is specializing into relatively high-price export goods in the vertically differentiated sectors. On the contrary, a high share of LQVIIT means that a country is exporting relatively low-price (quality) goods. In particular, if the relative unit value of a good is below (over) the limit of $1-\alpha$ ($1+\alpha$), it is considered as a low (high) quality export.

As far as OECD countries are concerned (graph 6), from 2005 to 2010, Italian G-L index³⁷ on average takes values between 3% (New Zealand) and 41% (Germany) with a concentration in the interval 10%-20% (Ireland, Greece, Finland, Japan, Denmark, Portugal, Hungary, Sweden, Turkey) and 23%-30% (Czech Republic, Netherlands, Poland, United States, Austria, Belgium, Spain, Switzerland).

Graph 5. Trend in the aggregate indices of the Italian IIT with 68 partner countries, 1990-2010

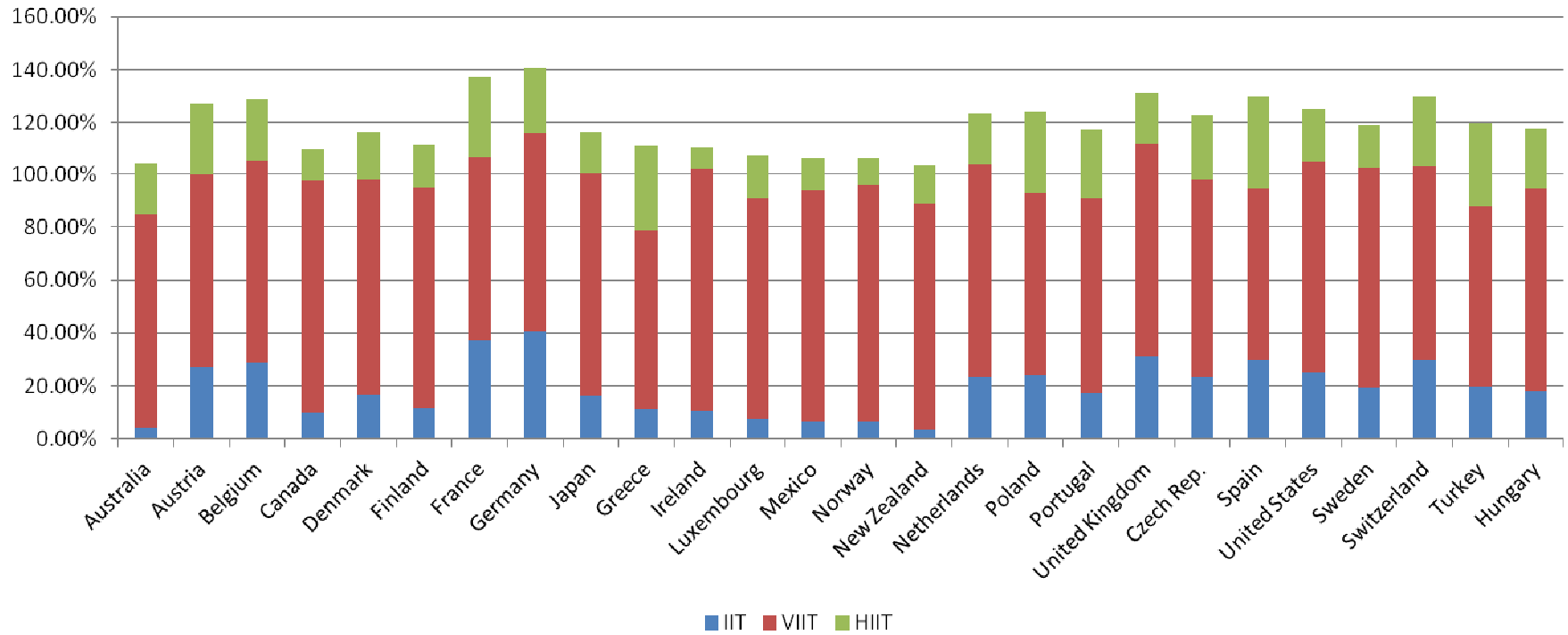


Source: author's calculations based on EUROSTAT data.

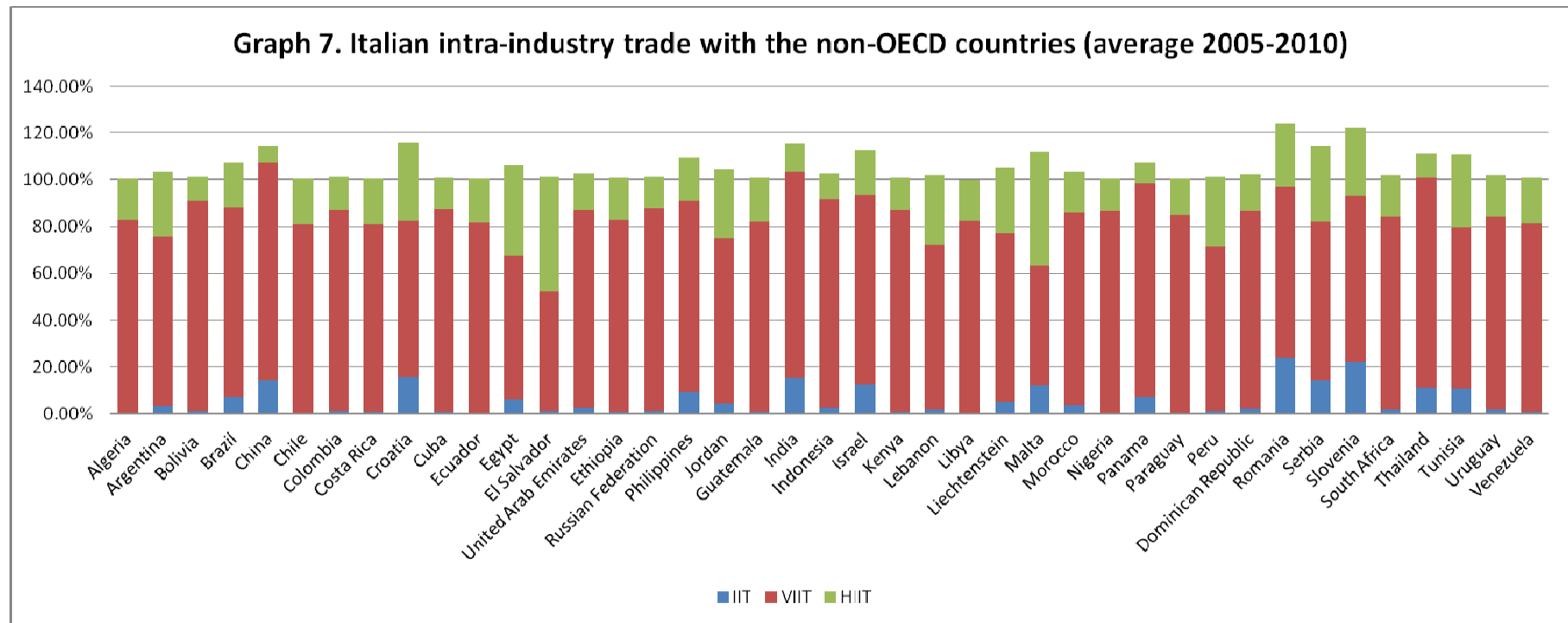
Graph 7 instead shows the intra-industry trade indices between Italy and non-OECD countries (average for 2005-2010). As predicted by the theoretical literature on IIT, with the more dissimilar countries the share of IIT on total trade is lower. The IIT index mainly is in the interval 0.5% - 5%. With countries such as China, Croatia, India, Israel, Malta, Romania, Serbia, Slovenia, Thailand and Tunisia a higher IIT index is registered. It probably incorporates trade in intermediate goods.

³⁷ The Grubel-Lloyd (G-L) index is the most used measure of IIT. It will be described in the section 3.3.1.

Graph 6. Italian intra-industry trade with OECD countries (average 2005-2010)



Source: author's calculations based on EUROSTAT data.



Source: author's calculations based on EUROSTAT data.

3.3 An econometric model of IIT with both immigration and emigration

3.3.1 The model's specification

In order to explain the share of IIT in total bilateral trade of the country under study, Italy here, by the stocks of immigrants and emigrants, we use an empirical model where the share of IIT in total bilateral trade of Italy with each partner country is explained by a set of country-specific characteristic variables, indicated by V_{it} (which the theoretical literature on the determinants of IIT has identified) and by measures for the stocks of immigrants living in Italy, labeled as imm_{it} , and the Italian emigrants to the partner country, labeled as emi_{it} ³⁸:

$$IIT_{it} = f(V_{it}, imm_{it}, emi_{it}),$$

where subscripts i and t indicate Italian partner country and time, respectively.

We use a static measure of IIT, the Grubel and Lloyd index (GL index, henceforth), which is the most widely employed index for measuring IIT.

The index (1) includes data at the 8-digit level of CN8 classification which identify a product j exchanged between Italy and each partner country i ³⁹:

$$IIT_i = \frac{\sum_j (X_j + M_j) - \sum_j |X_j - M_j|}{\sum_j (X_j + M_j)} \quad (1)$$

where X_j and M_j are respectively Italian exports and imports of product j to/from partner i ⁴⁰.

³⁸ For the theoretical literature on the determinants of IIT see Krugman (1979, 1981), Lancaster (1980), Dixit and Norman (1980), Helpman (1981), Helpman e Krugman (1985), Flam and Helpman (1987).

³⁹ Also a 6-digit level is a good level of disaggregation, but, in our opinion, not as good as an 8-digit level for capturing the share of vertical intra-industry trade. Since unit values are used to deduce quality differentiation, they must be related to an exactly defined product. Put another way, a very high level of disaggregation is necessary in order to eliminate problems associated with sector composition and make differences in unit values a real indicator of quality.

In our empirical model, which tests for the potential positive effect of immigration and emigration on IIT, the key variables are obviously immigrants (*imm*) and emigrants (*emi*), but we also need to take into account other variables, which theoretical and empirical literature suggest to be determinants of IIT, in order to make the model as explanatory as possible. As for the framework explaining IIT, we start from the empirical work of Helpman (1987), who tested some hypotheses that came out of the international trade theory based on monopolistic competition in differentiated products. Specifically, he tested three hypotheses. One of them is that the larger the similarity in factor composition (or proportion), the larger the share of intra-industry trade. In order to test this hypothesis he used per capita income as a proxy for factor composition. Hence, we include in the model a variable capturing factor composition differences, but, like Blanes (2005), we follow Hummels and Levinshon's (1995) procedure employing direct measures for factor endowments differences, namely capital-to-labor ratio differences instead of per capita income since, as Hummels and Levinshon (1995) have pointed out, the use of per capita income as a proxy for factor composition could be an inappropriate technique for two reasons. First, it is a valid proxy if only two factors are employed in production and all goods are traded; second, empirical literature generally interprets differences in per capita income as a proxy for consumer tastes, as posited by Linder (1961). In addition, market size and market proximity are suggested to be positive determinants of IIT, therefore we augment the empirical specification with variables that respectively control for size and the geographical distance between trading countries, the latter as a trade-friction variable⁴¹. Then, since our reference country is Italy, we also include in the model a dummy variable for countries which are members of the European Union (EU) as a trade-facilitating variable. Finally, we add to

⁴⁰ Alternative measures of IIT exist. For example Blanes (2005) uses in the analysis of immigration effects on the IIT in Spain the Fontagné and Freudenberg index and the Brühlhart index for marginal IIT, which is a dynamic measure of IIT, but he obtains the same results estimating with the FF and B indexes as dependent variables.

⁴¹ This variable is employed in order to take into account the important role of geography. Geographical closeness and common border (contiguity) have been recognized to be positive drivers of IIT, even though different explanations are posited. According to Balassa (1986b), "it can be assumed that the availability of information decreases, and its costs increase, with distance"; whereas Venables et al. (2003) find that geographical distance contribute to increase differences in country characteristics, which, in turn, negatively affect IIT. Hummels and Levinsohn (1995) state that "if the elasticity of substitution between varieties of a differentiated product is greater than the elasticity of substitution between homogeneous goods, a decline in distance will have a larger (positive) effect on the volume of intra-industry trade than it does on the volume of inter-industry trade." They find that country-pair-specific effects (such as distance) explain the IIT behavior much more than time-varying factor measures.

the basic model our key variables: the stock of immigrants and the stock of emigrants. The former refers to the number of immigrants living in Italy by origin country and the latter indicates the number of Italians living abroad by destination country.

Thus, our first empirical model is:

$$TIIT_{it} = \alpha_0 + \alpha_1 emi_{it} + \alpha_2 imm_{it} + \alpha_3 KLdif_{it} + \alpha_4 size_{it} + \alpha_5 dist_i + \alpha_6 eu_{it} + \mu_{it} \quad (I)$$

where:

- $TIIT_{it}$ indicates the share of intra-industry trade on total trade between Italy and the partner i at time t (measured by GL index);
- emi_{it} is the natural logarithm of the stock of Italian emigrants living in the partner country i at time t ;
- imm_{it} is the natural logarithm of the stock of immigrants living in Italy from the partner country i at time t ;
- $KLdif_{it}$ measures the differences in relative factor endowments as the logarithm of the absolute value of the difference in the ratio K/L between Italy and the partner country i at time t , that is: $\log \left| \frac{K_t^{Italy}}{L_t^{Italy}} - \frac{K_t^i}{L_t^i} \right|$;
- $size_{it}$ is a market size control variable included to capture the importance of combined size, measured as the logarithm of the mean value between Italy and the partner country i 's GDP at time t : $\log \text{mean} (GDP_t^{Italy}, GDP_t^i)$
- $dist_i$, as said before, is a proxy for trade transaction costs (such as transport costs and information costs about characteristics of the product), measured as the logarithm of the geographical distance between Italy and the partner country i ;
- eu_{it} is a dummy variable which takes the value of 1 if a country in the sample is a member of the European Union in year t , otherwise it is 0⁴².

⁴² The eu explanatory variable has the subscript t , since our sample includes countries that become members of the EU in different years.

In order to check the existence of a different qualitative effect of migration flows on vertical and horizontal trade, we have to estimate separate specifications for each type of ITT. These two other models will be identical to the first, but with a different dependent variable, vertical and horizontal intra-industry trade indices respectively:

$$VIIT_{it} = \alpha_0 + \alpha_1 emi_{it} + \alpha_2 imm_{it} + \alpha_3 KLdif_{it} + \alpha_4 size_{it} + \alpha_5 dist_i + \alpha_6 eu_{it} + \mu_{it} \quad (II)$$

$$HIIT_{it} = \alpha_0 + \alpha_1 emi_{it} + \alpha_2 imm_{it} + \alpha_3 KLdif_{it} + \alpha_4 size_{it} + \alpha_5 dist_i + \alpha_6 eu_{it} + \mu_{it} \quad (III)$$

To discriminate between these two kinds of IIT in our empirical data we have followed the methodology proposed by Greenaway, Hine and Milner (1994, 1995). Assuming that differences in prices reflect quality differences⁴³ and that prices can be proxied by unit values, we have calculated the unit values⁴⁴ of imports and exports for the trade of Italy with 68 countries (the most relevant from the migration flows point of view) over the period 2005-2010⁴⁵. Then, trade goods are considered to be vertically differentiated if:

$$\left| \frac{UVX_i^j}{UVM_i^j} \right| > 1 + \alpha \quad (2)$$

where UVX_i^j is the unit value of exports, while UVM_i^j is the unit value of imports and α represents a dispersion factor, which we arbitrarily have fixed at $\pm 20\%$.

Trade goods are considered to be horizontally differentiated when the $\frac{UVX_i^j}{UVM_i^j}$ ratio lies within the range:

$$1 - \alpha \leq \frac{UVX_i^j}{UVM_i^j} \leq 1 + \alpha \quad (3)$$

⁴³ Stiglitz (1987) states that the price is the variable that reflects better than others the relative quality of a product. Caves and Greene (1996) find a positive correlation between price and quality which grows as the production vertical differentiation increases.

⁴⁴ We have calculated unit values as the ratio between the value of the trade flow (import or export of the 8-digit commodity) and its weight.

⁴⁵ We have included in the sample only those countries with a number of migrants higher than 1000 units in each observed year. We have restricted our analysis to the period 2005-2010 due to the lack of emigrants' data by destination countries before 2005.

We have decomposed the Grubel-Lloyd (G-L) index into vertical and horizontal IIT by using information derived from unit values calculated at the 8 digit level (according to CN)⁴⁶. In the numerator of the G-L index only the trade flows of those product categories whose unit value of exports relative to the unit value of imports is outside (or within) the range of variation (arbitrarily fixed at $\pm 20\%$) have been included. By so doing, we obtain the share of vertical (horizontal) IIT on total trade when the absolute value of the difference between the export and import unit values is more (less) than 20% ⁴⁷.

3.3.2 Data sources and variables

With regard to the source of data used for building our database, data on bilateral imports and exports at the 8 digit level of disaggregation were obtained by EUROSTAT, Comext database; *K*, *L* and *GDP* come from World Bank Development Indicators; the *dist* variable comes from the great circle distance in kilometres between capital cities, available on the website <http://www.wcrl.ars.usda.gov/cec/java/lat-long.htm>; the stock of immigrants in Italy from ISTAT, migration trends and foreign population, Istat annuals on line; the stock of Italians living abroad from AIRE database (Anagrafe Italiani Residenti all'Estero)⁴⁸.

⁴⁶ Although Greenaway, Hine and Milner (1994, 1995) used data at 5 digit level according to SITC, in this work, following Celi (1999), we have decided to use a more disaggregated level of data since, as already explained in the note 8, we believe that allows us to better discriminate the “quality” trade (VIIT) from the “variety” trade (HIIT). The underlying idea is that the unit value calculated at the 8-digit level in respect to the one at the 5-digit level is an unbiased proxy of price, able to better differentiate products by quality. Moreover, as Celi (1999) suggests, with such a level of disaggregation it would be more appropriate to speak of ‘intra-product trade’ rather than ‘intra-industry trade’, but we keep the usual terminology.

⁴⁷ In the literature an alternative approach comes out from the works of Abd-el-Rahman (1984), Freudenberg and Muller (1992) and CEPII (1995). This methodology, which is not based on Grubel-Lloyd index, adopts a minimum threshold of overlap in trade (10%) in order to establish whether both exports and imports of a particular product represent either two-way trade or one-way trade. Moreover, on the presumption that differences in unit values capture quality differences, traded goods are defined as vertically (horizontally) differentiated if it turns out unit values of exports and imports are outside (within) a certain range of variation (fixed at $\pm 15\%$). By these two criteria (defined at the more disaggregated level) it is possible to distinguish: the two-way trade in vertically differentiated products (characterized by overlap and high unit value differences); the two-way trade in horizontally differentiated products (characterized by overlap and low unit value differences); the one-way trade (characterized by low overlap).

⁴⁸ It is worth underlining that the data from AIRE managed by the Home Office in collaboration with Commons present some restrictions. On one hand, the AIRE’s Statistics are rounded down, because to register all those who keep emigrating is not possible. It is a formal bureaucratic procedure that it is not

What do we expect about parameter signs when equation (I) is estimated? Geographical distance should have a negative sign since it negatively affects trade. Indeed, trade transaction costs, given by formal and informal barriers to trade and transport costs, generally go up with distance, discouraging trade. Moreover, as Blanes and Martìn (2000) state “We consider that distance will affect IIT more than inter-industry trade, since differentiated products will have more national substitutes (different in quality or any other characteristic) than homogeneous products.” (p. 434)⁴⁹ The dummy variable, *eu*, which was placed in the model to control for the common market effect, should be positive, since to be a member of the European Union facilitates trade⁵⁰. The sign of *KLdif* cannot be defined for certain *a priori*. According to Krugman (1979, 1981) and Helpman (1987), who developed a model of monopolistic competition generating horizontal IIT, differences in factor endowments negatively affect intra-industry trade. Hummels and Levinsohn (1995), using two alternative proxies for differences in factor composition, reached the same conclusion of Helpman (1987). Instead, Falvey and Kierzkowsky (1987) developed a model which explains vertical intra-industry trade and argued that IIT could be positively affected by differences in factor endowments when goods are vertically differentiated⁵¹. Moreover,

always done by those who leave the country. For example, many young people go abroad (sometimes with repeated moves and without a definitive plan) pivoting on families and, therefore, they do not register themselves on the above-mentioned civil registry. At the end of May 2000 the results showed 2,756,000 Italians signed up to go abroad, with an underestimate of more than one million people in respect to what was observed by consulates. On the other hand, the 28% of those signed up with AIRE are registered as “son of Italian citizen born abroad” and 2.6% for achieving citizenship. This means that an emigrant and someone registered with AIRE are not necessarily the same thing. Besides, it has to be taken into account that the expression “Italians abroad” indicates several categories: those who emigrated but remained Italian citizens; those who emigrated and have achieved citizenship of the place where they have gone to; the emigrants’ sons, who can be Italian citizens or citizens of the foreign place or can have both citizenships; descendants (grandchildren or great grandchildren) of one or both Italian parents, which maintain the foreign citizenship but are also interested in the origins of their families, or together with a cultural interest, want to achieve the Italian citizenship. In light of this, there are 4 million Italian citizens, of which about half is physically migrated, and 60 million (estimated by Foreign Ministry) as community of Italian origin spread all over the world. Nevertheless, AIRE is full of detailed data about, for example, the regional origin of the Italians abroad. Therefore, using these breakdowns one can have a more articulated overview.

⁴⁹ A negative effect of distance on IIT has been found by several empirical studies such as: Balassa and Bauwens (1987), Stone and Lee (1995), Blanes and Martin (2000), Crespo and Fontoura (2004), Reganati and Pittiglio (2005).

⁵⁰ A positive sign has been found by Crespo and Fontoura (2004) and Pittiglio (2009) for HIIT; Gullstrand (2001), Crespo and Fontoura (2004), Reganati and Pittiglio (2005) and Pittiglio (2009) for VIIT.

⁵¹ The basic idea is the following: when two countries have different factor endowments (capital and labor), then the higher quality variety of the differentiated good is produced using relatively capital intensive techniques. It follows that the country with a higher income, relatively capital abundant, will

empirical studies, such as Greenaway et al. (1994) for UK and Blanes and Martín (2000) for Spain, showed that if total IIT is disentangled in its vertical and horizontal components, vertical IIT increases with differences in factor endowments bringing out a positive relation between them. In light of this we know that, in order to better identify the sign of the effect of factor endowment differences on IIT, we should break IIT down in both vertical and horizontal IIT and estimate them separately – equations (II) and (III) - and this is what we also do because our goal is to test the hypothesis of a different effect of emigration and immigration on the two types of IIT.

According to Lancaster (1980), Loertscher and Wolter (1980), Falvey and Kierzkowski (1987), and Markusen and Venables (2000) the share of IIT on total trade is positively correlated with the market size of two trading partner countries, thus we expect the coefficient of the size variable, α_4 , to be positive⁵². Finally, the coefficients of the *emi* and *imm* variables are expected to be both positive, because, as the Network Theory suggests, emigrants and immigrants are able to reduce the costs related to imperfect contract enforcement, imperfect information and uncertainty, which characterize international transactions, and consequently they can positively affect the intra-industry trade. However, when vertical and horizontal components of intra-industry trade are separately tested – equation (II) and equation (III), respectively – we should expect an impact of migration flows that is virtually different for the two forms of IIT. On the one hand, the standard pro-trade role of immigration in terms of transaction costs reduction seems more appropriate when HIIT is involved, because the immigrants' knowledge of home country markets and available products should enhance more “variety trade” than “quality trade”. On the other hand, the likely emergence of income differentials between immigrants and natives should activate more VIIT. However, if we assume diversity in human capital between immigrants and emigrants, then it is reasonable to expect differences between emigration and immigration in their effects on the two forms of IIT. Actually, in the case of Italy, emigrants seem to be endowed with more human capital than immigrants and they move especially towards countries more advanced than

specialize in relatively high quality goods, while the one with a lower income, relatively labor abundant, will specialize in low quality goods.

⁵² Empirical evidence of a positive effect of market size (measured by the average GDP) on IIT has been provided by Balassa (1986a), Balassa and Bauwens (1987) and Greenaway et al. (1994). For a positive effect on HIIT: Greenaway et al. (1994), Greenaway et al. (1999), Crespo and Fontoura (2004), Pittiglio (2009); on VIIT, among others: Greenaway et al. (1994), Stone and Lee (1995), Greenaway et al. (1999), Gullstrand (2001), Crespo and Fontoura (2004), Reganati and Pittiglio (2005), Pittiglio (2009).

immigrants' motherland. Under these circumstances, it would not be strange to expect a stronger impact of emigrants on "variety trade" (HIIT).

3.3.3 Methodology

Since intra-industry trade index varies between 0 and 1, the method of ordinary least squares (OLS) is not appropriate and cannot be directly used for the model's estimate (estimated coefficients would not be efficient). Caves (1981) noted that the OLS method has the disadvantage of not ensuring that predicted values of the dependent variable will be within its feasible range from 0 to 1. In order to overcome this problem we follow the methodology adopted in literature by Loertscher and Wolter (1980), Caves (1981), Bergstrand (1983), Stone and Lee (1995), Reganati and Pittiglio (2005). We use a logit transformation of the GL index and then we estimate the model by OLS:

$$\log\left(\frac{IIT_{it}}{1-IIT_{it}}\right) = \beta' X_{it} + \mu_{it}$$

where β and X are the vectors of parameters and explanatory variables, respectively.

It is necessary to point out that the logit transformation rules out all observations where the *IIT* index takes values 0 or 1. Hence, some authors estimate a logistic function, using non-linear least squares (Greenaway and Milner, 1984; Balassa, 1986a; Balassa and Bauwens, 1987; Aturupane et al., 1999; Blanes and Martìn, 2000; Gullstrand, 2002; Reganati and Pittiglio, 2005; Pittiglio, 2009). We do not apply this methodology since our database does not contain values exactly equal to 0 or 1 for the dependent variable.

Finally, other authors use a Tobit model (Veeramani, 2002; Sharma, 2002; Byun and Lee, 2005; Pittiglio, 2009). We apply the tobit estimation as robustness check (see Appendix, table 3.2A).

3.4 The estimation results

The results of the estimation carried out for all of the product categories (CN 1-97) and the 68 countries of the sample are reported in Table 1.1. Straightaway we can note the model fits very well with the data since the explanatory power of the regressions is quite high. All of the coefficients have the expected signs and are statistically significant except for the emigration variable. The effect of emigration becomes highly significant (at the 1 per cent level) only in reference with the horizontal intra-industry trade (column III), confirming the intuition expressed above.

Controlling for the economic masses and the transportation costs (the latter proxied by bilateral distance), Italy has a higher propensity to trade with European Union countries, as the positive and significant coefficient of the *eu* dummy suggests. The negative coefficient of *KLdif* means that countries more similarly endowed than others have a higher share of intra-industry trade on total trade. When equation (II) is estimated, the negative sign in front of the *KLdif* coefficient still remains and this result is not what we would expect for VIIT regression. However, the inverse relationship between VIIT and the relative capital endowment variable is not surprising if we look at characteristics of countries; data reveals that the most capital-intensive industries are those with less scope for product differentiation (chemical, food processing, etc.). Indeed, in order to capture quality differentiation in trade in a proper way, a proxy for relative human capital endowment would be more appropriate than K/L ratio. Actually, studies on the industry-specific determinants of VIIT found a positive relationship between human capital intensity variable and intra-industry trade in vertically differentiated products⁵³. Although these valid arguments, in the spirit of studies focussing on country-specific determinants of IIT, we have preferred to maintain the usual specification for the relative factor endowment variable.

⁵³ Greenaway et al. (1995) found a positive sign when VIIT is regressed on the share of non manual employment in total employment. Celi (1999, 2010) found a positive relationship between up-market VIIT and the ratio of non manual to manual workers. It is worth noting that both contributions are studies focussing on industry specific determinants of IIT. In other words, regressions are carried out across industries and not across countries, as we do in the present work.

**Table 1.1 - The impact of immigration and emigration on the Italian IIT
(logistic transformation of GL index – pooled OLS)**

	TIIT	VIIT	HIIT	Expected sign	
	Column I	ColumnII	Column III	VIIT	HIIT
emi	0.03 (1.20)	0.02 (0.76)	0.11*** (3.31)	+	+
imm	0.11*** (3.74)	0.10*** (3.30)	0.17*** (4.78)	+	+
dist	- 0.52*** (-5.90)	-0.45*** (-5.14)	-0.70*** (-7.13)	-	-
eu	1.07*** (6.39)	1.07*** (6.42)	1.04*** (5.39)	+	+
KLdif	- 0.18*** (-4.60)	-0.19*** (-4.84)	-0.17*** (-3.17)	+	-
size	1.49*** (10.28)	1.52*** (10.21)	1.16*** (7.28)	+	+
constant	- 40.22*** (-10.27)	-41.85*** (-10.34)	-32.64*** (-7.52)		
R²	0.6021	0.5746	0.5886		
Obs.	385	385	385		

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

As we predicted, a strong positive linkage between immigration and Italy's intra-industry trade with her partners is found over the period 2005-2010. The effect of emigration on the IIT index is also positive, but not statistically significant. These findings of the effects of immigration and emigration on the share of Italian TIIT support the underlying idea that migration flows are able to trigger IIT through the knowledge brought by immigrants and emigrants about the foreign markets and different social institutions, as well as the business/personal contacts with their home countries.

Observing in detail the predicted values of immigration and emigration's parameters, it appears evident that the emigration has a lower effect on the share of IIT

than immigration. Thinking of the network effect, this result could astound us if we agree with the notion of a positive relation between level of skill and effect on trade⁵⁴. Indeed this finding would seem to be out of line with what we said about the peculiar characteristics of the Italian migration flows. Recently, Italian emigrants are mostly skilled migrants, whereas immigrants, for the most part, have a lower educational level than emigrants. Because of this peculiarity of Italian migration flows we would expect results opposite to those we obtained. As immigrants are mostly lower skilled individuals they have smaller abilities to create new trade than emigrants because what encourages them to leave their country, above all, is something related to the economic aspect (earning and saving money). Instead, most emigrants are highly skilled and are moved by different reasons such as, more vocational training, more occupational possibilities and research of better work conditions (usually at bigger firms). They also try to do business and benefit from the potential of the host country, increasing the possibilities of creating trade. Actually, the results do not really contrast with what we said if we consider that the Italian emigration is surely the more ancient phenomenon, but the “skilled emigration” is only a recent phenomenon, which will produce results in the long run.

It is worthy to note that the basic idea of different effects of the inward and outward flows of Italy on the share of IIT finds validation in the data.

With regard to the VIIT and the HIIT (columns II-III) we find results equally interesting, and above all, in line with the conception that migration flows have different effects on the two types of IIT. Indeed, the estimated coefficients vary between them and the impact on the VIIT and HIIT is different. In particular, one can note that the emigration and immigration’s effect grows with reference to the variety trade: the Italian inward and outward migration flows help to increase more the HIIT than the VIIT. As far as emigration is concerned, this finding should not amaze us if we take into account that the Italian emigrants mostly go to the developed countries where the HIIT prevails. Also for the immigrants we find the coefficient capturing the effect on the VIIT is similar to the TIIT, that is to say almost all of the TIIT is VIIT while what changes is the HIIT. Moreover, while immigrants also have a positive effect on the “quality” trade (vertical IIT), activated by income differentials between immigrants and

⁵⁴ For an analysis of the relationship between skilled migration and trade see, among others, Felbermayr and Jung (2009).

natives, emigrants trigger only the “variety” trade (horizontal IIT), indeed the coefficient of the *emi* variable on the VIIT is not statistically significant.

The larger effect of both emigration and immigration on horizontal IIT is exactly what should explain the preference effect next to the network effect: the amount of knowledge about home countries, the migrants naturally embody, affects, as expected, trade in goods differentiated by attributes.

Then, if we only refer to the TIIT without doing a distinction between its two components, we underestimate the potential effect of migration (both emigration and immigration) on the IIT because the biggest effect is the network one, captured by the HIIT.

3.5 Sensitivity analysis of results

Since the theory does not dictate the appropriate specification, but it only informs about some variables that ought to enter the specification (Hummels and Lenvinsohn, 1995), we have to check our results’ robustness by estimating reasonable alternative specifications.

We perform a sensitivity analysis for the set of explanatory variables. In table 3.2, 3.3 and 3.4 we first investigate whether the migration flows’ effect on TIIT, VIIT and HIIT is sensitive to the set of transaction cost variables included in the specification of the model, *dist* and *eu* (columns II, III and IV) and, secondly, to the inclusion or exclusion of the variable that measures differences in relative factor endowments: *KLdif* (columns from V to VIII). This check is followed by a deeper analysis of the effect of migration flows on the intra-industry trade indexes by distinguishing origin/destination countries in two groups: OECD and non-OECD (table 3.5).

Table 3.2 - Sensitivity analysis for THIT

	II	III	IV	V	VI	VII	VIII
<i>emi</i>	0.07** (2.23)	-0.00 (-0.12)	0.03 (0.71)	0.08** (2.56)	0.14 (1.26)	0.04 (0.99)	0.14*** (3.55)
<i>imm</i>	0.10*** (3.05)	0.19*** (6.09)	0.24*** (6.53)	0.07** (2.35)	0.04*** (4.55)	0.11*** (3.49)	0.11*** (3.13)
<i>dist</i>	-0.78*** (-13.24)	–	–	-0.52*** (-6.22)	-0.87*** (-15.56)	–	–
<i>eu</i>	–	1.81*** (17.75)	–	1.31*** (8.51)	–	2.07*** (22.43)	–
<i>KLdif</i>	-0.32*** (-7.11)	-0.23*** (-4.62)	-0.65*** (-8.97)	–	–	–	–
<i>size</i>	1.39*** (8.17)	1.24*** (8.35)	0.67*** (3.78)	1.73*** (11.99)	1.82*** (10.27)	1.56*** (11.19)	1.48*** (7.13)
<i>const</i>	-33.91*** (-7.38)	-37.58*** (-8.98)	-18.09*** (-3.62)	-48.75*** (-12.86)	-48.35*** (-10.21)	-48.33*** (-13.09)	-46.54*** (-8.27)
R^2	0.5579	0.5406	0.3495	0.5716	0.4973	0.5070	0.2013
Obs	385	385	385	398	398	398	398

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

In table 3.2, immediately one can note that if we do not include variables such as *dist* and *eu* and we do not control for the countries' factor endowments, the explanatory power of regressions that rule out these variables is much lower than that of the estimates that do. In particular, when the variable *eu* is omitted the value of the *emi* variable's coefficient grows and becomes statistically significant. Whereas, when we exclude the variable *dist* the effect of the emigration falls and is no longer significant. The effect on the immigration's coefficient is exactly the opposite: it reduces when *eu* is

excluded from the model and increases when we do not consider the variable *dist*, even if it continues to be positive and significant.

Therefore, excluding the variables relating to transaction costs and regional integration agreements would lead to overestimate both the effects of immigration and emigration, which would capture the other country-specific effects. There would be the case of the omitted variable bias.

The columns VI to VIII correspond to the columns II to IV, but dropping the KLdif variable. Also in this case the only effect is an increase of the coefficients, but the sign of the relation remains the same.

Table 3.3 - Sensitivity analysis for VIIT

	II'	III'	IV'	V'	VI'	VII'	VIII'
emi	0.05* (1.80)	-0.01 (-0.35)	0.02 (0.48)	0.06** (2.10)	0.13*** (4.17)	0.03 (0.80)	0.13*** (3.34)
imm	0.09*** (2.64)	0.16*** (5.42)	0.21*** (5.96)	0.06** (1.98)	0.03 (0.91)	0.09*** (3.06)	0.09*** (2.76)
dist	-0.71*** (-11.99)	–	–	-0.45*** (-5.40)	-0.79*** (-14.26)	–	–
eu	–	1.71*** (17.04)	–	1.31*** (8.62)	–	1.96*** (21.73)	–
KLdif	-0.33*** (-7.27)	-0.23*** (-4.87)	-0.63*** (-9.19)	–	–	–	–
size	1.43*** (8.13)	1.31*** (8.85)	0.77*** (4.39)	1.77*** (11.90)	1.86*** (10.16)	1.62*** (11.45)	1.55*** (7.43)
constant	-35.57*** (-7.49)	-39.57*** (-9.53)	-21.23*** (-4.29)	-50.62*** (-12.87)	-50.22*** (-10.23)	-50.26*** (-13.28)	-48.56*** (-8.58)
R ²	0.5286	0.5264	0.3486	0.5468	0.4683	0.4967	0.2068
Obs	385	385	385	398	398	398	398

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

Table 3.4 - Sensitivity analysis for HIIT

	II''	III''	IV''	V''	VI''	VII''	VIII''
emi	0.14*** (4.01)	0.06 (1.48)	0.09** (2.20)	0.16*** (4.60)	0.22*** (5.88)	0.10** (2.43)	0.21*** (4.79)
imm	0.15*** (4.21)	0.26*** (7.01)	0.32*** (7.54)	0.10*** (3.04)	0.08** (2.24)	0.16*** (4.01)	0.16*** (3.72)
dist	-0.95*** (-13.98)	–	–	-0.73*** (-7.76)	-1.06*** (-16.76)	–	–
eu	–	2.03*** (15.11)	–	1.23*** (6.99)	–	2.30*** (19.74)	–
KLdif	-0.31*** (-5.44)	-0.24*** (-3.52)	-0.71*** (-7.95)	–	–	–	–
size	1.06*** (6.21)	0.82*** (4.55)	0.18 (0.96)	1.42*** (9.15)	1.50*** (8.70)	1.17*** (7.46)	1.08*** (5.31)
constant	-26.48*** (-5.76)	-29.05*** (-5.58)	-7.10 (-1.29)	-41.08*** (-10.23)	-40.70*** (-8.97)	-40.41*** (-9.74)	-38.33*** (-6.96)
R ²	0.5564	0.5036	0.3186	0.5531	0.5030	0.4575	0.1722
Obs	384	384	384	397	397	397	397

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

The tables 3.3 and 3.4 show the results of the sensitivity analysis for VIIT and HIIT. Again, looking at the coefficients of our key variables, we reach the conclusion that the first specification of the model (in table 3.1) is the best, since it has the highest explanatory power and does not suffer of omitted variable bias.

An additional test for a deeper investigation of the relationship between migration flows and IIT is strictly related to the fact that home and host country of migration flows differ from one another. Italy stands out because of her own migration flows.

Immigration and emigration seem to be a South-to-North and a North-to-North matter respectively. Furthermore, empirical and theoretical literature about IIT suggests that IIT occurs mainly between developed countries. By estimating all of the countries together, one might think that the effect of immigration on the IIT index is underestimated. For this reason we estimate the IIT effects of immigrants coming from developed countries separately from those of immigrants coming from developing countries. We do the same for emigrants.

We consider as developed countries those who are members of the OECD and as developing countries all of the others. To better identify the effect of the different kind of migrants (those coming from and moving to OECD countries and those coming from and moving to non-OECD countries) we let the elasticity of trade for immigration and emigration vary among the two different groups of countries. Let us define a dummy variable which assumes value 1 if the country is a member of the OECD, and otherwise it is 0. On the contrary, the dummy named non-OECD takes values 1 if the country is not a member of the OECD, otherwise it is 0. Finally, we introduce four interaction variables, two of them deriving from the product of the OECD dummy with the emigration and immigration variables respectively, and the other two are the product between the non-OECD dummy and the emigration and immigration variables. These last four variables replace the stock of immigrants and emigrants in the regression.

What we expect depends on the degree of similarity of trading countries. If we assume that Italy has characteristics similar to those of a developed country, as the literature on the linkage migration-trade suggests, there are reasons to expect that the effect on the share of IIT by emigration and immigration to and from developing countries will be larger than the effect of migration flows to and from developed countries. This consideration is due to the fact that the larger the dissimilarity between host and home country is, the bigger the reduction of the transaction costs caused by immigrants and emigrants will be. Because Italy is more similar to a developed country, we expect the information about the political, sociological and economic context brought by immigrant and emigrants coming from and moving to developing countries

will be more valuable and therefore, these migrants will contribute more to increase the share of IIT on total trade⁵⁵.

On the other hand, from the theoretical and empirical literature on the determinants of IIT, we know that the more dissimilar countries are, the less the share of IIT on total trade. Hence, it is necessary to consider this ostensible contradiction: on the one hand, the North-South trade supports the link migration-trade, but on the other hand, the smaller share of IIT in the trade North-South does not support the link migration-trade. In order to avoid the composition effect, it would be necessary to focus on the dissimilar migration flows' impact on the two components of IIT. For instance, one could think of a positive link between migration (South to North) and VIIT. This link is related to the presence of income differentials between immigrants and natives that could generate qualitative differentiation in trade flows (immigrants would trigger imports of low quality goods). Symmetrically, it could be supposed a positive link between immigration (North to North) and HIIT. In this case, in presence of a lesser income difference among immigrants and natives, the activation of “variety” trade would prevail⁵⁶. We obtain both these results as shown in Table 3.5. Specifically, immigrants from non-OECD countries, with respect to immigrants from OECD countries, are those which have the biggest and statistically significant impact on vertical IIT, whereas immigrants from OECD countries, as expected, have a statistically significant impact only on TIIT and horizontal IIT and instead they do not affect the “quality” trade. Moreover, we can also note that immigrants from non-OECD countries are found to significantly promote HIIT as well. This finding is exactly explained by the network effect.

Therefore, we find that immigrants from non-OECD countries activate both types of IIT: qualitative differentiation (vertical IIT), because of income differences between immigrants and natives, and product differentiation (horizontal IIT), due to the network effect.

⁵⁵ Girma and Yu (2002) support an argument similar to that we have just exposed. They state, also finding validation in the data, that in the UK immigrants coming from Commonwealth countries, which have institutions much similar to those of the UK, bring with themselves less additional information than immigrants who come from non-Commonwealth countries. Therefore these contribute less to create trade.

⁵⁶ It is worth pointing out that this argument strengthens the relevance of disentangling IIT in its two components, VIIT and HIIT.

Table 3.5 - The effects of immigration and emigration on TIIT, VIIT and HIIT by OECD Status

	TIIT	VIIT	HIIT
imm x OECD	0.10*** (2.66)	0.04 (1.11)	0.20*** (3.04)
imm x nonOECD	0.16*** (4.31)	0.16*** (4.22)	0.24*** (3.75)
emi x OECD	-0.02 (-0.65)	-0.03 (-1.22)	-0.03 (0.90)
emi x nonOECD	0.03 (0.67)	0.02 (0.52)	0.15*** (2.81)
size	1.24*** (7.77)	1.31*** (7.94)	1.12*** (5.04)
dist	-0.52*** (-6.11)	-0.46*** (-5.42)	-0.82*** (-6.41)
eu	0.62*** (3.92)	0.62*** (3.99)	0.48** (2.26)
OECD	1.80*** (2.95)	2.38*** (3.83)	2.97*** (2.64)
KLdif	-0.10*** (-2.81)	-0.11*** (-3.05)	-0.14** (-2.19)
constant	-34.52*** (-8.08)	-37.27*** (-8.38)	-32.72*** (-5.39)
R ²	0.6366	0.6168	0.3883
Obs	385	385	385

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

As far as emigration is concerned, we find a positive and statistically significant impact only for emigrants who go to non-OECD countries, specifically on HIIT. The positive impact of emigration on HIIT is the same finding shown in Table 1.1, but in this case the distinction between emigrants going to OECD and non-OECD countries allows us to better interpret the result. Indeed, based on the previous findings one could think that those who triggered trade were emigrants going to OECD countries since it is trade in goods differentiated by attributes (but same quality). Separating OECD and non-OECD emigrants, instead, permits us to understand that there is not only a consumption effect and, moreover, makes possible to reflect on the kind of emigrant who goes towards non-OECD countries. Actually, the greater positive effect on the HIIT could be explained by the fact that the Italian who moves to a developing country usually is an entrepreneur able to activate trade thanks to his professional background and knowledge about his home country. The information he brings with himself affects the *variety* trade instead of *quality* trade, thus there is not only a consumption effect (as one could think). This is only a possible explanation which, however, needs to be empirically tested⁵⁷.

Therefore, summing up, immigrants coming from non-OECD countries activate vertical IIT and this is what we expected because of income differences, but, in addition, they also foster the horizontal IIT thanks to preference and information channels. Immigrants from OECD countries, instead, affect only the horizontal IIT and not the vertical IIT since it is assumed a similar income distribution. Moreover, also the existence of a *consumption effect* could justify the positive impact of immigrants from OECD countries on the *variety* trade. In the particular case of emigrants, we find a positive and significant effect on the variety trade by emigrants who move to non-OECD countries. This outcome is exactly in line with the prediction that the positive effect of migration flows on IIT will be higher the more dissimilar the countries are.

It is worthy to underline that both migration flows (immigration and emigration) activate HIIT more than VIIT, but the explanation behind is different. With regard to immigrants from OECD/non-OECD countries the driving force is the consumption (preference) effect (perhaps together with an information effect in the case of non-OECD immigrants); whereas in the case of emigrants going to non-OECD countries, the

⁵⁷ Data on the educational level and on the work of emigrants by destination country, at the moment of writing is, unfortunately, not available. Therefore, it remains an issue to be explored.

business effect, based on the relevance of information in different contexts (OECD/non-OECD), is acting. This different effect (business versus preferences) depends on differences in human capital between non-OECD immigrants and emigrants in the case of Italy.

3.6 Concluding remarks

In this chapter we have tested the hypothesis that the stock of migrants helps to explain the share of intra-industry trade in total trade. Following Blanes (2005), we have linked the literature about migration and trade to the literature about the determinants of IIT. The former suggests that migration flows contribute to enhance trade mainly by reducing trade transaction costs; the latter states that trade transaction costs are a negative determinant more of intra- than inter-industry trade. In effect, differentiated sectors are shown to be the most affected by trade barriers, and the elasticity of aggregate trade with respect to trade barriers (both variable and fixed) is inversely related to the elasticity of substitution (Chaney, 2008)⁵⁸. For these reasons emerging from the studies on IIT, it makes sense to focus on the relationship migration-IIT that literature on migration-trade has overlooked.

The present empirical work pioneers the assessment of the intra-industry trade enhancing effect of migration using Italy as a testing ground and extends the existing literature by examining the pro-intra-industry trade effect of both immigrants and emigrants. Moreover, a further innovative element characterizing our study is represented by the separate estimation of migration's effects on vertical and horizontal intra-industry trade, in analogy with the prescriptions of IIT literature according to which theoretical explanations of vertical intra-industry trade differ significantly from Krugman style models of horizontal intra-industry trade. Consequently, empirical tests

⁵⁸ Krugman (1980) developed a model with identical firms showing that a higher elasticity of substitution between goods magnifies the impact of trade barriers on trade flows. Due to consumers' 'love for variety' in presence of less substitutable goods consumers are willing to buy foreign varieties even when they have a higher cost, and so, in this case, trade barriers have little impact on bilateral trade flows. Unlike Krugman (1980), Chaney (2008) finds that "the impact of trade barriers on trade flows is dampened by the elasticity of substitution, and not magnified". In particular, the author develops a model, thanks to which, by introducing firm heterogeneity in productivity as well as fixed costs of exporting, it is possible to predict the elasticity of aggregate trade flows with respect to trade barriers to be inversely related to the elasticity of substitution.

on the industry specific determinants of IIT should be carried out separately for VIIT and HIIT (Greenaway, Hine and Milner, 1995). In the particular case of international migration, the pro-trade role of immigration in terms of transaction costs reduction seems more appropriate when HIIT is involved, because the immigrants' knowledge of home country markets and available products should enhance more *variety trade* than *quality trade*. On the other hand, growing income differentials between immigrants and natives should activate more VIIT.

In order to carry out this empirical test, we have used country-level data that combines the Italian intra-industry trade indexes and both the stock of immigrants coming into Italy and the stock of Italian emigrants by countries, for the period 2005-2010.

Then, assuming price as a valid indicator of a product's quality, the intra-industry trade has been divided in its two components, horizontal and vertical, in order to check which one is more affected by migration.

The empirical model, we have employed, has been developed starting from models by Helpman (1987) and Hummels and Levinshon (1995) and adding to the basic specification our key variables: the stock of immigrants and the stock of emigrants.

The estimation's results suggest that our hypotheses are consistent with the data: both emigration and immigration exert a positive and robust influence on the share of intra-industry trade between Italy and its partner countries. We also find that the pro-intra-industry trade effect of immigrant networks is greater than that of emigrant networks.

With regard to the VIIT and the HIIT, we find that the discrimination between these two components of IIT leads one to deeply investigate the link migration-IIT and improves the interpretation of empirical outcomes. The results allow us to conclude that migration flows, as predicted, have different effects on the two types of IIT. Indeed, the estimated coefficients are very different between themselves and the impact on the VIIT and HIIT is quite different. In particular, the immigration and emigration's effects grow with reference to the variety trade; put another way, the impact of immigration and emigration on international trade turns to be more relevant when the variety trade (HIIT) is explicitly considered. This finding is in line with the prediction that the immigrants and emigrants' knowledge of home country markets and available products should enhance more *variety trade* than *quality trade*. Moreover, only for immigrants

we find a positive and significant effect also on vertical IIT. This result, due to income differentials between immigrants and natives, has been better explored through the separation of migration flows by different kind of countries (OECD and non-OECD) which has clearly shown that to affect VIIT are immigrants from developing countries. Moreover, this separation between OECD and non-OECD migration flows has also allowed us to better interpret the results related to emigration's effect. It has found out that emigrants towards non-OECD countries activate the horizontal IIT and not those going to OECD countries. This particular finding has led us to reflect on who could be the Italian emigrant who goes to developing countries and to do qualitative considerations on emigration. Although for Italy there is not official data on the educational level of emigrants, we can maintain that the past unskilled emigration has been combined with a more recent skilled emigration and who heads for non-OECD countries is likely to be an entrepreneur able to activate trade thanks to his professional background and knowledge about his home country.

Therefore, the distinction OECD/non-OECD countries has confirmed even more so the importance of disentangling the two components of IIT in order to reach a more careful interpretation of empirical evidence.

These results seem encouraging, in particular in light of the fact we have used a very highly disaggregated data and, unlike other studies, our calculations are based on a dataset where both manufacturing and non manufacturing industries are included.

However, it is worth underlining that due to the lack of detailed (quality) data on immigrants and emigrants for Italy, several interesting facets of migration-IIT link remain to be explored. One particularly interesting issue is, for instance, to understand how much of the pro-IIT effect of migration is related to the educational level of migrants. Furthermore, a deeper analysis would better bring to light policy implications. Based on our results, emigration and immigration seem to be a necessary support for the future of Italy in a globalized world: Italians living abroad and immigrants who have their relatives, connections and knowledge in the home country can be valued as an out-and-out network able to help the Italian trade and economic development. Hence, from this point of view, migration flows should not be discouraged. Nevertheless, an analysis of the relationship between migration and other forms of internationalization could lead to different policy implications. For instance, if from the empirical analysis there came

out a link of substitutability between migration flows and foreign direct investments (FDI), politics boosting outward FDI would contribute to contain excessive inward migration flows. Clearly, in this case we are not talking about trade, but FDI, and the direction of the link is opposite: from FDI to migration flows. This is only one example of the importance of analyzing the link between migration and other forms of internationalization, also in terms of richness of policy implications.

APPENDIX

Table 3.1A - Descriptive statistics for sample

Variable	Mean value	Standard deviation	Minimum value	Maximum value
LOGIMM	8.80	1.96	2.83	13.38
LOGEMI	8.85	1.95	6.24	13.38
LOGKLDIF	8.90	1.11	3.36	10.46
LOGDIST	8.05	1.07	6.21	9.83
LOGMEANGDP	27.86	0.36	27.52	29.74
<hr/>				
IIT	0.11	0.10	0.0002	0.42
HIIT	0.03	0.03	1.00e-17	0.15
VIIT	0.08	0.08	0.0002	0.33

**Table 3.2A - The impact of immigration and emigration on the Italian IIT
(Tobit estimation)**

	TIIT	VIIT	HIIT
emi	0.01*** (6.04)	0.01*** (4.65)	0.02*** (6.52)
imm	0.01*** (5.72)	0.01*** (5.16)	0.02*** (4.59)
dist	-0.04*** (-11.21)	-0.02*** (-8.91)	-0.01*** (-11.52)
eu	0.08*** (9.97)	0.06*** (10.07)	0.02*** (5.70)
KLdif	-0.01*** (-3.31)	-0.01*** (-3.49)	-0.00 (-1.58)
size	0.10*** (11.17)	0.08*** (11.98)	0.02*** (5.70)
constant	-2.50*** (-9.81)	-2.15*** (-10.75)	-0.36*** (-3.79)
Log Likelihood	611.928	706.417	996.668
LR Chi(2)	583.27	547.41	418.14
Obs	385	385	385

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variable. t-values are given in parentheses.

The positive effect of immigration and emigration on the intra-industry trade between Italy and its trading partners in the sample also comes out when we use a tobit estimation.

**Table 3.3A - The impact of immigration and emigration on the Italian IIT
(lagged variables)**

	TIIT	VIIT	HIIT
lagged emi	0.03 (0.94)	0.02 (0.47)	0.10** (2.30)
lagged imm	0.11*** (3.33)	0.10*** (2.86)	0.21*** (3.76)
dist	- 0.53*** (-3.92)	-0.47*** (-4.78)	-0.78*** (-5.37)
eu	1.10*** (5.74)	1.07*** (5.72)	1.11*** (4.83)
KLdif	- 0.17*** (-3.92)	-0.18*** (-4.26)	-0.17** (-2.26)
size	1.55*** (9.93)	1.59*** (9.76)	1.41*** (6.14)
constant	- 41.97*** (-10.01)	-43.33*** (-9.89)	-39.89*** (-6.52)
R²	0.6001	0.5748	0.3496
Obs.	320	320	320

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

In order to control the direction of causality, we have estimated a model where emigrants and immigrants have been replaced by their lagged. Results have revealed that the IIT impacts of both immigrants and emigrants do not change with the predetermined variables; hence we can conclude that the direction of causality we assumed in this work (from migration to IIT) is correct.

Chapter 4

THE ROLE OF MIGRATION ON THE QUALITY AND VARIETY TRADE. EVIDENCE FROM GERMANY

4.1 Introduction

The debate concerning whether labor movement and trade are complements or substitutes derives directly from the theory which is not conclusive in this regard. The factor price equalization theorem provides a strong inference that trade and immigration are substitutes, as far as the Heckscher-Ohlin assumptions hold. Thus, as people move from the sending to the receiving country, the relative factor endowments of the countries involved in migration become more similar (provided that there are no changes in capital stocks). This means that there will be no room for trade based upon comparative advantage. However, things can be rather different if the bilateral trade is of intra-industry type and it depends on the existence of scale economies and product differentiation. In this case, theory suggests that trade could occur even if trade partners have the same factor endowments. In this setting, a complementary relationship between international migration and trade could be explained by the network theory according to which immigrants can increase trade by providing information on foreign market risks and opportunities.

As previously discussed in this work, most of the empirical literature, relating to immigration and trade, focuses on the bilateral volume of trade as the variable to be explained by migration⁵⁹. This chapter supplies a further empirical contribution to that narrow strand of literature about the link between migration and intra-industry trade. Specifically, here we undertake an investigation of the migration's impact on the German intra-industry trade.

The choice of Germany as referential country for the analysis is mostly due to the consideration that immigration has always been an issue of great significance to

⁵⁹ For a survey of the empirical literature on the immigration- trade link we remind to the chapter 2 of the present work.

Germany, given its historical role as a final destination for migrants. Moreover, its high development level (it is in the top 10 highly developed countries), the distribution of immigrant's home-countries (both developing and developed countries), the German labor market's characteristics and finally, the mere fact of being the main country to which, everyday, Italy is compared to by mass media (Italy's economic reliability is evaluated on the parameters of German stability and productivity) make it an ideal candidate for our purposes.

The contribution of this chapter is twofold: it provides new evidence about the determinants of intra-industry trade and extends the existing literature by means of the investigation of the migration-IIT nexus in the presence of vertical and horizontal differentiation using Germany as testing ground.

The chapter is structured as follows. The next section describes the migration and intra-industry trade patterns in Germany. Section 3 discusses the data and methodology adopted in the analysis. Section 4 shows the main findings. Section 5 presents some robustness checks. Finally, section 6 provides concluding remarks.

4.2 Immigration, emigration and intra-industry trade trends

4.2.1 Germany, a well-known case of immigration country

Among the other European countries, Germany, from the labor migration point of view, stands out for being a country of strong immigration. The number of immigrants going to Germany, minus the departures from Germany, leads to a net surplus of immigrants during the 1960s when the guest workers were employed in low skill jobs, particularly jobs in which Germans were increasingly unwilling to work⁶⁰. To facilitate the entrance of immigrants was certainly the labor market policy of Germany in the 1960s and 1970s, aimed at promoting the inflow of foreign workers through the stipulation of bilateral recruitment agreements with some countries abundant in labor force: Italy (1955), Spain (1960), Greece (1960), Turkey (1961), Morocco (1963),

⁶⁰ In the 1950s and 1960s, immigrants were mostly employed in mines, construction industry, and heavy industry.

Portugal (1964), Tunisia (1965), and Yugoslavia (1968)⁶¹. These agreements initially had the purpose of finding a solution to the problem of low-skill workforce shortage characterizing the last fifties and the early sixties. Subsequently, they were used to promote economic growth and to increase the standard of living in Germany. In turn, the increase of immigration has encouraged the introduction of reforms on the labor market regarding the shortening of working hours and working life time. In addition, Germany signed diplomatic bilateral agreements, in particular that with Turkey, which contributed to the reduction of migration costs. Other covenants concerned reimbursement of travel costs or provision of accommodation. Such a migration policy caused the transition from temporary to permanent immigration over the years. In particular, factors which had a role in this change were: firstly the fact that, except for Turkey towards which there existed an agreement fixing a maximum stay of two years⁶², recruitment agreements did not set a limit for the length of stay; secondly, there were not any restrictions to the family reunification; thirdly, firms could prolong work contracts with the foreigners without additional costs.

After 1973, the German immigration policy changed: it became stricter in filtering the immigrants, leading to a decrease in the immigration surplus until the early 1980s. Moreover, in 1983 and 1984, for lightening migratory pressure, there were even adopted measures oriented to promote the return migration of unemployed foreign workers by giving financial incentives (Dustmann, 1996).

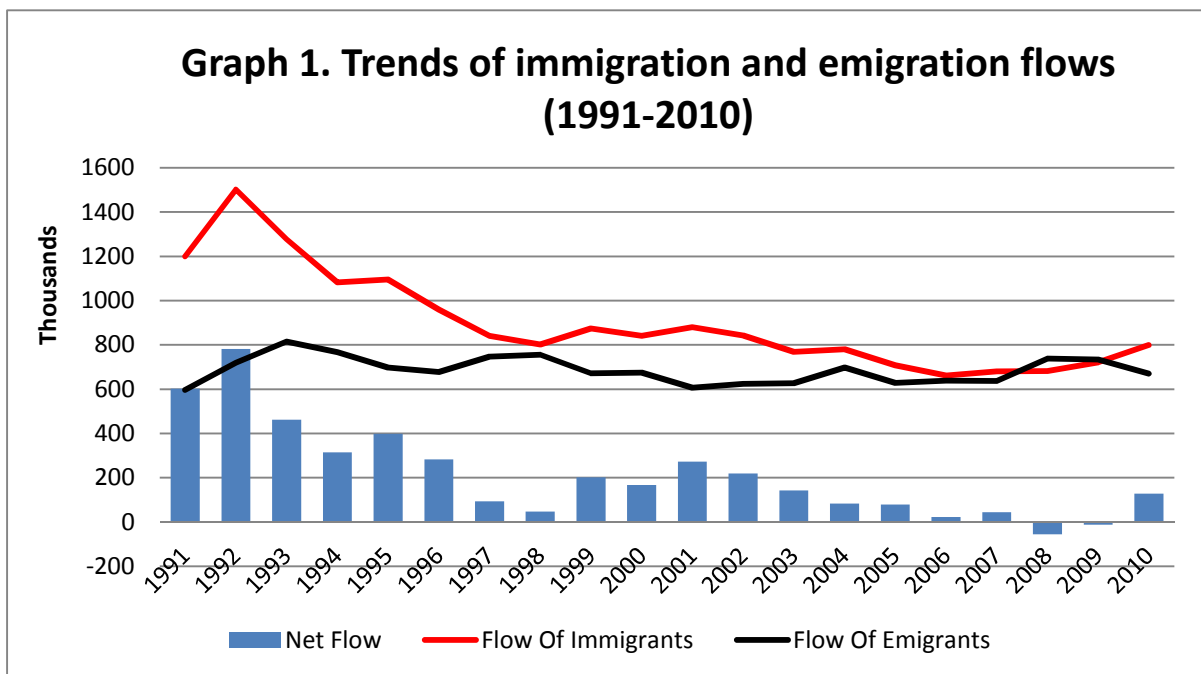
However, starting from 1985, the need for unskilled labor rose again, forcing Germany to loosen its strict immigration policy. There was introduced the double regime which distinguished between high-skilled and low-skilled immigrants. The German labor market was often meager of high-skilled supply to be employed in high tech sectors. Skilled immigrants could obtain residence and a work permit without an expiration date, whereas unskilled immigrants received a short-run permit, renewable with reference to the economic conditions' development. All this induced a new inflow of workforce.

⁶¹ It is worth reminding that in 1957, with the birth of the European Economic Community, the right of freedom of movement for workers within the Community has been recognized, and so always more foreigners were attracted by opportunities offered by German industry during the economic boom.

⁶² This restriction was eliminated in 1964 by means of a new treaty.

The all time highest immigration surplus was registered in 1992 and was mostly due to the collapse of the Berlin Wall in 1989 and the reunification of West and East Germany. Thenceforth, the immigration surplus has been gradually decreasing.

Graph 1 shows the trends of immigration and emigration flows in Germany from 1991 to 2010. Two facets clearly stand out: as underlined above, Germany is mainly a country of immigration, mostly due to the recruitment policy of the fifties and sixties which had long-run effects on labor migration. However, also emigration is relevant, as one can infer from the trend nearly increasing (in 2008 it has even been recorded that the number of those who left Germany was larger than the number of arrivals).



Source: author's calculations on DeStatis data.

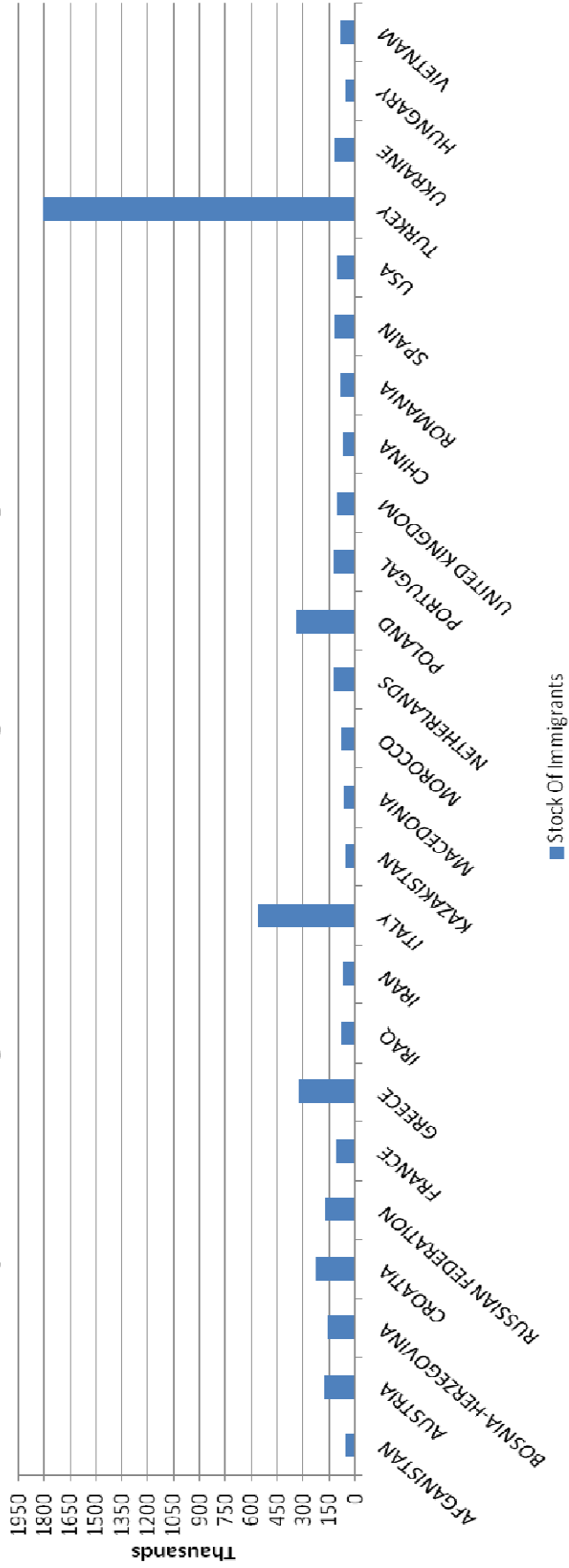
Graph 2 highlights the main origin countries of immigration. On average the main source countries are: Turkey, Italy, Poland, Greece, Croatia, Austria and Bosnia-Herzegovina. In particular, it is ascertained that more than ¼ of entering people are the immigrants who historically have represented the most important inward migration flow

of Germany, namely the Turks, and Italy is the most sizeable community among those coming from a European Union's country⁶³.

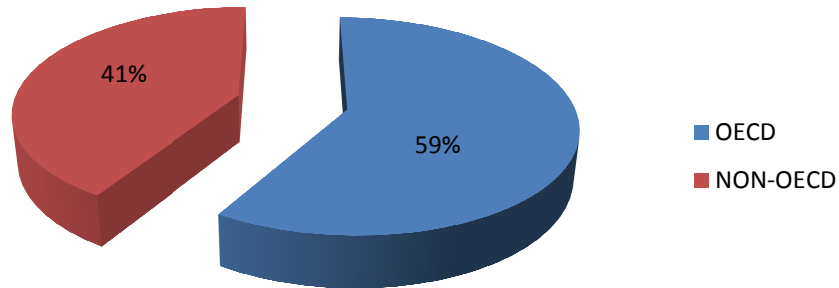
Graph 3, instead, illustrates the main countries involved in the migration flows, by distinguishing between OECD and non-OECD countries. What the pie graphs reveal is that although a high percentage of immigrants has a non-OECD origin (41%), both immigrants and emigrants mainly come from OECD countries (59% and 69%, respectively).

⁶³ At the end of the 1960s, the biggest community in Germany was the Italian one. In the following years it drifted to the third position behind the Turks and Yugoslavs. In the first decade of the 2000s it increased again representing the second immigrant community in Germany.

Graph 2. Main origin countries of immigration. Average 2000-2009

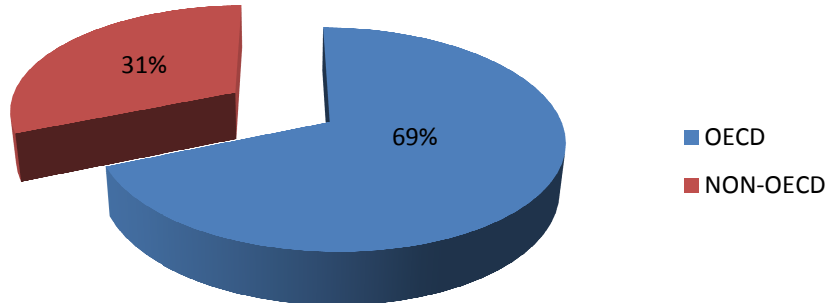


**Graph 3. Immigrants' origin countries.
Average 2000-2009**



Source: author's calculations on DeStatis data.

**Graph 4. Emigrants' destination countries.
Average 2000-2009**



Source: author's calculations on DeStatis data.

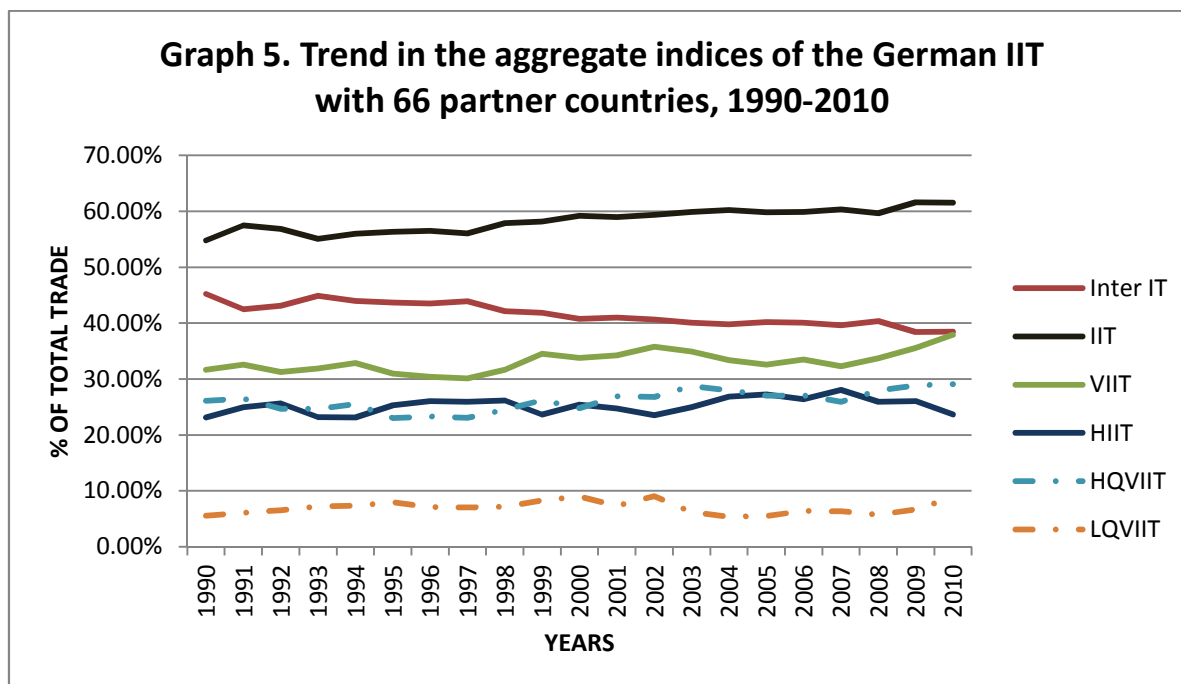
With regard to the composition of immigrants, nowadays, foreign population regularly living in Germany is characterized by people with a different status. On the one hand, there are political refugees that over the last decades have reached safety from the institution or implosion of the regimes in their origin country. The share of refugees is composed by exiles that arrived from Indochina in the 1970s, from Iran and Iraq in the 1980s and by the continuous inflow from South-Eastern Europe started with the ex-Yugoslavia disintegration process in the early 1990s. On the other hand, there are

temporary workers whose entrance, between 1955 and 1973, was regulated by very restricted bilateral agreements centered on the figure of the *Gastarbeiter*, namely the “guest” worker, who received a temporary permit (of changeable duration, between one and five years, renewable). Finally, a share of immigrants is represented by illegal immigrants, gypsies and alone minor refugees who have been sent by family or who migrated on their own initiative.

Until the oil crisis of 1973, immigrants were mainly absorbed by industry; after the fall of the Berlin Wall in 1989 industrial production got into a crisis and this led to a crisis in the labor supply as well. Besides, the labor supply had to withstand the impact of workers coming from Eastern Europe. Following the reunification of Germany, the reconstruction of Berlin has engaged many immigrants, even if very often in poor working and living conditions. In addition, many others immigrants, such as the Italians, work in services, most of them in food and hotel service. However, tertiary for immigrants often also means low-level services where any qualifications are not required and there are occasional jobs, as happened in gastronomy and in collateral sectors of the branch of cleaning. Thus, a conspicuous number of immigrants, Italians included, work as managers, researchers, self-employees or are students going to Germany for reasons of study that then decide to remain for work. In fact, it has been pointed out that, nowadays, those who move to Germany are more skilled than German natives. In particular, a study realized by Brücker (2013) reveals that the composition and qualifications of immigrants have been notably changed over the last decade. Between 2000 and 2009, the share of those who arrive in Germany with a PhD, a degree or a professional education has grown from 23% to 43%, whereas the percentage of those devoid of any educational qualification has decreased from 41% to 25%. Among Germans without a migratory background, with an age included between 15 and 65 years, the percentage of those who have a PhD, degree or professional education or technical skills falls instead to 26%; 12% is the percentage of those devoid of any educational qualification. Nevertheless, as Brücker notices, nowadays in the Federal Republic there still remains the misconception that who immigrate to Germany are, above all, less skilled, who thus run into problems with integration in the German labor market or education system.

4.2.2 A glance at the intra-industry trade pattern of Germany

Over the years 1990-2010 Germany has gone through a growth in the share of intra-industry trade in total trade with 66 partner countries, from nearly 55% to 61%, and, in particular, in the share of vertical intra-industry trade. Graph 5 shows the trend in the aggregate indices of the German IIT with the countries in the sample for the period 1990-2010. What we can infer is that Germany's intra-industry trade with the considered countries is mainly of vertical type, involving exchange of varieties that have different levels of quality: on average it accounts for almost the 60 percent of total IIT in 1990-2010. Specifically, vertical trade of higher quality has increased up to 61 percent on total vertical IIT in 2010.

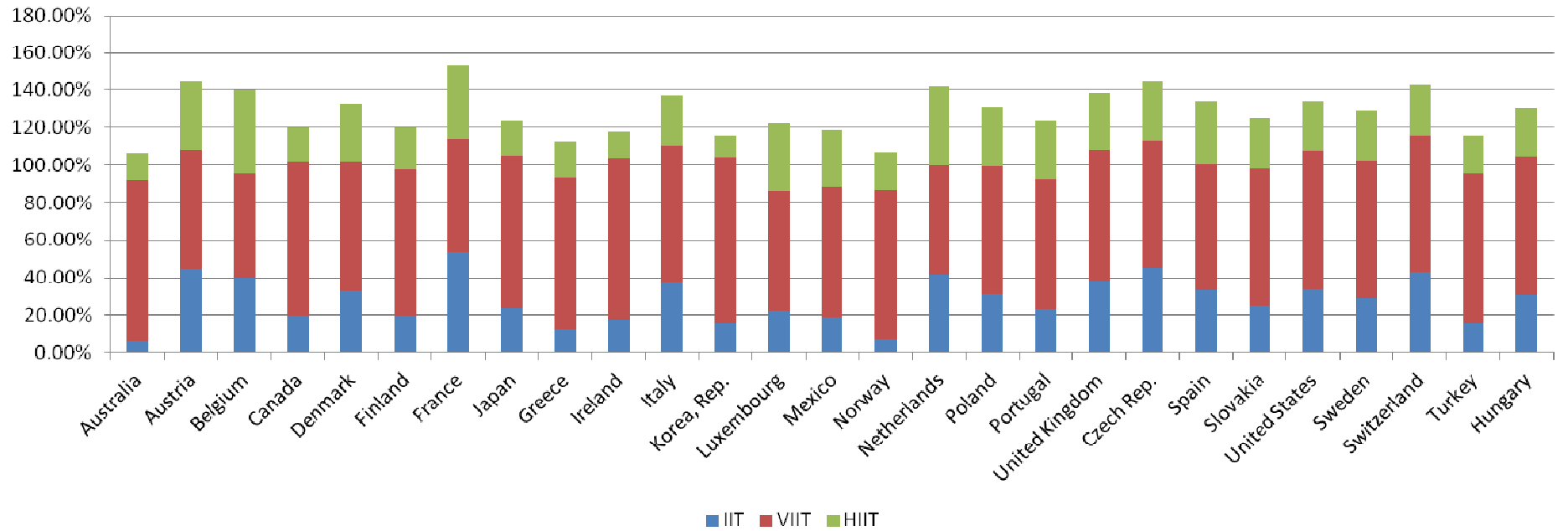


Source: author's calculations based on EUROSTAT data.

As far as OECD countries are concerned (graph 6), in the period 2000-2009 the German GL index on average takes values between 6% (Australia) and 53% (France) with a concentration in the interval 15%-25% (Canada, Ireland, Greece, Finland, Korea, Japan, Luxembourg, Mexico, Portugal, Slovakia, Turkey) and 30%-45% (Austria, Belgium, Czech Republic, Denmark, Hungary, Italy, Netherlands, Poland, Spain, Switzerland, United Kingdom, United States). Instead, graph 7 shows the intra-industry

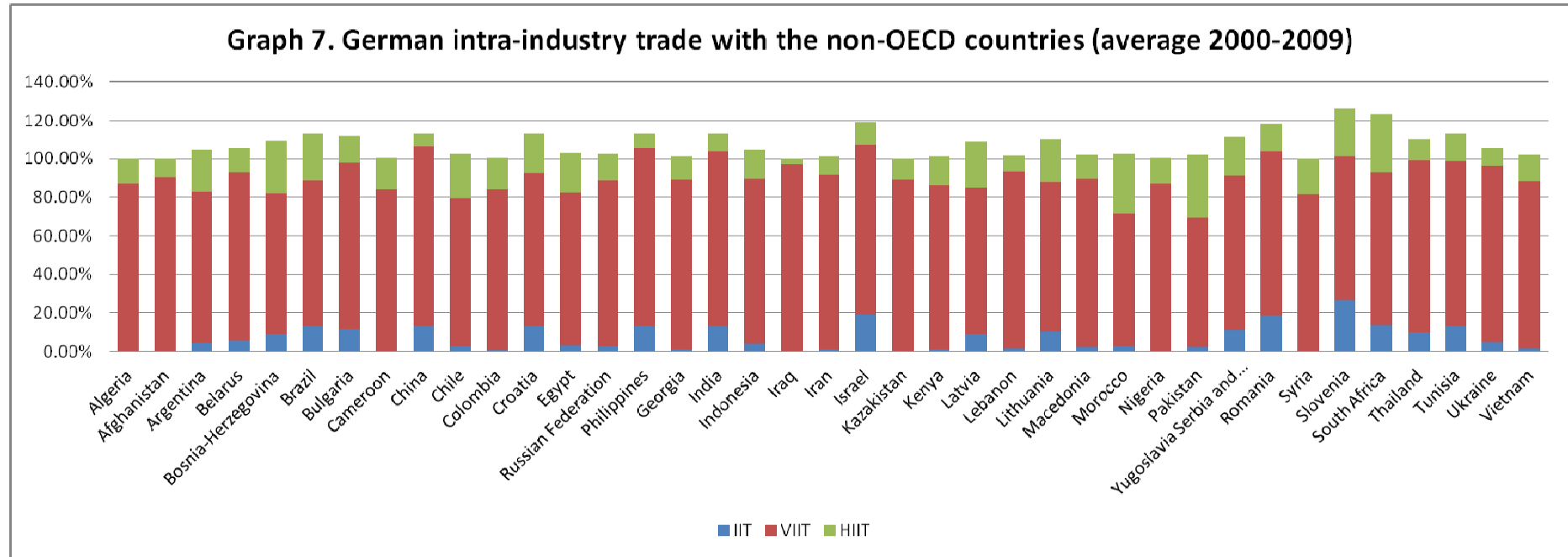
trade indices between Germany and non-OECD countries (average for 2000-2009). As predicted by the theoretical literature on IIT, with the more dissimilar countries the share of IIT on total trade is lower. In this case, the IIT index mainly is in the interval 0.15% - 4%. With countries such as Brazil, Bulgaria, China, Croatia, India, Israel, Lithuania, Yugoslavia-Serbia-Montenegro, Romania, Philippines, Slovenia, South Africa, Thailand and Tunisia, a higher IIT index is registered. It probably incorporates trade in intermediate goods.

Graph 6. German intra-industry trade with OECD countries (average 2000-2009)



Source: author's calculations based on EUROSTAT data.

Graph 7. German intra-industry trade with the non-OECD countries (average 2000-2009)



Source: author's calculations based on EUROSTAT data.

4.3 An econometric model of IIT with immigration

4.3.1 The models' specification

In order to explain the share of IIT in total bilateral trade of the country under study, Germany here, by the stock of immigrants, the crucial independent variable is obviously that related to immigration. However, since there exist other determinants for the intra-industry trade levels (TIIT, HIIT, VIIT), we must include in the model other variables in order to control for their effects and avoid biased estimation due to omitted variables. In the light of this, we use an empirical model where the share of IIT in total bilateral trade of Germany with each partner country is explained by a set of country-specific characteristic variables, indicated by V_{it} , which the theoretical literature on the determinants of IIT has identified and by a measure for the stock of immigrants living in Germany, labeled as imm_{it} ⁶⁴:

$$IIT_{it} = f(V_{it}, imm_{it}),$$

where subscripts i and t indicate German partner country and time, respectively.

Like for the case of Italy, we use a static measure of IIT, the Grubel and Lloyd index (GL index, henceforth), which is the most widely employed index for measuring IIT.

The index (1) includes data at the 8-digit level of Combined Nomenclature (CN) classification which identify a product j exchanged between Germany and each partner country i ⁶⁵:

$$IIT_i = \frac{\sum_j (X_j + M_j) - \sum_j |X_j - M_j|}{\sum_j (X_j + M_j)} \quad (1)$$

⁶⁴ For the theoretical literature on the determinants of IIT see Krugman (1979, 1981), Lancaster (1980), Dixit and Norman (1980), Helpman (1981), Helpman e Krugman (1985), Flam and Helpman (1987).

⁶⁵ Also a 6-digit level is a good level of disaggregation, but, in our opinion, not as good as an 8-digit level for capturing the share of vertical intra-industry trade. Since unit values are used to deduce quality differentiation, they must be related to an exactly defined product. Put another way, a very high level of disaggregation is necessary in order to eliminate problems associated with sector composition and make differences in unit values a real indicator of quality.

where X_j and M_j are respectively German exports and imports of product j to/from partner i .

In our empirical model, which tests for the potential positive effect of immigration on the share of IIT, the key variable is obviously the stock of immigrants (imm), but we also need to take into account other variables, those which theoretical and empirical literature suggest as determinants of IIT, in order to make the model as explanatory as possible.

We test some hypotheses that came out of the international trade theory based on monopolistic competition in differentiated products. One of them is that the larger the similarity in factor composition, the larger the share of intra-industry trade. In order to test this hypothesis, we include in the model a variable capturing factor composition differences. In this regard we follow Hummels and Levinshon's (1995) procedure employing direct measures for factor endowments differences, namely capital-to-labor ratio differences⁶⁶. In addition, we augment the empirical specification with variables that respectively control for size and the geographical distance to test the hypotheses deriving from theory that intra-industry trade between countries is more intense when the average of their market size is large and barriers (both tariff and non-tariff) to trade are low. Then, since our reference country is Germany, we also include in the model a dummy variable for countries which are members of the European Union (EU) as a trade-facilitating variable. Finally, to the standard gravity equation's explanatory factors we add our key variable: the stock of immigrants, defined as the number of immigrants living in Germany by origin country.

Thus, our first empirical model is the following:

$$TIIT_{it} = \alpha_0 + \alpha_1 imm_{it} + \alpha_2 KLdif_{it} + \alpha_3 size_{it} + \alpha_4 dist_i + \alpha_5 eu_{it} + \mu_{it} \quad (I)$$

where:

- $TIIT_{it}$ indicates the share of intra-industry trade on total trade between Germany and the partner i at time t (measured by GL index);
- imm_{it} is the natural logarithm of the stock of immigrants living in Germany from the partner country i at time t ;

⁶⁶ See chapter 3, section 3.3, for a detailed explanation of the reason we employ this variable.

- $KLdif_{it}$ measures the differences in relative factor endowments as the logarithm of the absolute value of the difference in the ratio K/L between Germany and the

partner country i at time t , that is: $\log \left| \frac{K_t^{Germany}}{L_t^{Germany}} - \frac{K_t^i}{L_t^i} \right|$;

- $size_{it}$ is a market size control variable measured as the logarithm of the mean value between Germany and the partner country i 's GDP at time t :

$$\log \text{mean} (GDP_t^{Germany}, GDP_t^i);$$

- $dist_i$, as said before, is a proxy for trade transaction costs (such as transport costs and information costs), measured as the logarithm of the geographical distance between Germany and the partner country i ;
- eu_{it} is a dummy variable which takes the value of 1 if a country i in the sample is a member of the European Union in year t , otherwise it is 0⁶⁷.

The other two models we estimate in order to check the existence of a different qualitative effect of migration flows on vertical and horizontal intra-industry trade are:

$$VIIT_{it} = \alpha_0 + \alpha_1 imm_{it} + \alpha_2 KLdif_{it} + \alpha_3 size_{it} + \alpha_4 dist_i + \alpha_5 eu_{it} + \mu_{it} \quad (II)$$

$$HIIT_{it} = \alpha_0 + \alpha_1 imm_{it} + \alpha_2 KLdif_{it} + \alpha_3 size_{it} + \alpha_4 dist_i + \alpha_5 eu_{it} + \mu_{it} \quad (III)$$

We remind that in order to discriminate between these two forms of IIT in our empirical data we have followed the methodology proposed by Greenaway et al., (1994; 1995)⁶⁸, based on the assumption that differences in prices reflect quality differences and that prices can be proxied by unit values. Hence, we have decomposed the Grubel-Lloyd (G-L) index into vertical and horizontal IIT by using information deriving from unit values calculated at the 8 digit level (according to CN)⁶⁹ for 66 countries over the period 2000-2009.

⁶⁷ The *eu* explanatory variable has the subscript t , since our sample includes countries that became members of the EU in different years.

⁶⁸ For the description of this methodology see chapter 3, section 3.3.1.

⁶⁹ Although Greenaway, Hine and Milner (1994, 1995) used data at 5 digit level according to SITC, in this work, following Celi (1999), we have decided to use a more disaggregated level of data, since, as already explained in the note 8, we believe that allows us to better discriminate the *quality* trade (VIIT) from the *variety* trade (HIIT). The underlying idea is that the unit value calculated at the 8-digit level respect to the one at the 5-digit level is an unbiased proxy of price, able to better differentiate products by

4.3.2 Data sources and explanatory variables

With regard to the source of data used for building our database, data on bilateral imports and exports at the 8 digit level of disaggregation were obtained by EUROSTAT, Comext database; K , L and GDP come from the World Bank Development Indicators; the $dist$ variable comes from the great circle distance in kilometres between capital cities, which is available on the website <http://www.wcrl.ars.usda.gov/cec/java/lat-long.htm>; the stock of immigrants in Germany has been provided by the Federal Statistical Office of Germany.

What do we expect about parameter signs when equation (I) is estimated? According to Balassa (1986), Balassa and Bauwens (1987), Hummels and Levinshon (1995), geographical distance should have a negative sign since it negatively affects trade. Indeed, trade transaction costs, given by formal and informal barriers to trade and transport costs, generally go up with distance discouraging trade. Moreover, as Blanes and Martín (2000) state “we consider that distance will affect IIT more than inter-industry trade, since differentiated products will have more national substitutes (different in quality or any other characteristic) than homogeneous products.”⁷⁰ The dummy variable, eu , which was placed in the model to control for the common market effect, should be positive, since to be a member of the European Union facilitates trade⁷¹. The sign of $KLdif$ cannot be defined for certain *a priori*. According to Krugman (1979, 1981) and Helpman (1987), who developed a model of monopolistic competition generating horizontal IIT, differences in factor endowments negatively affect intra-industry trade. Instead Falvey and Kierzkowsky (1987) developed a model which explains vertical intra-industry trade and argued that IIT could be positively affected by differences in factor endowments when goods are vertically differentiated⁷². Moreover,

quality. Moreover, as Celi (1999) suggests, with such level of disaggregation it would be more appropriate to speak of ‘intra-product trade’ rather than ‘intra-industry trade’, but we keep the usual terminology.

⁷⁰ A negative effect of distance on IIT has been found by several empirical studies such as: Balassa and Bauwens (1987), Stone and Lee (1995), Blanes and Martín (2000), Crespo and Fontoura (2004), Reganati and Pittiglio (2005).

⁷¹ A positive sign has been found by Crespo and Fontoura (2004) and Pittiglio (2009) for HIIT and Gullstrand (2001), Crespo and Fontoura (2004), Reganati and Pittiglio (2005) and Pittiglio (2009) for VIIT.

⁷² The basic idea is the following: when two countries have different factor endowments (capital and labor), then the higher quality variety of the differentiated good is produced using relatively capital intensive techniques. It follows that the country with a higher income, relatively capital abundant, will

empirical studies, such as Greenaway et al. (1994) for UK and Blanes and Martín (2000) for Spain, showed that if total IIT is disentangled in its vertical and horizontal components, vertical IIT increases with differences in factor endowments, bringing out a positive relation between them. In light of this, we know that in order to better identify the sign of the effect of factor endowment differences on IIT, we should break IIT down into both vertical and horizontal IIT and estimate them separately – equations (II) and (III) – and we do this also because our goal is to test the hypothesis of a different effect of immigration on the two types of IIT.

According to Lancaster (1980), Loertscher and Wolter (1980), Falvey and Kierzkowski (1987), and Markusen and Venables (2000) the share of IIT on total trade is positively correlated with the market size of two trading partner countries, thus we expect the coefficient of the size variable, α_3 , to be positive⁷³.

Finally, the coefficient of the *imm* variable is expected to be positive because, as the Network Theory suggests, immigrants can contribute to reduce the costs related to imperfect contract enforcement, imperfect information and uncertainty, which characterize international transactions, and consequently they can positively affect the intra-industry trade. However, when vertical and horizontal components of intra-industry trade are separately tested – equation (II) and equation (III), respectively – we should expect the migration's impact being virtually different for the two forms of IIT. On the one hand, the standard pro-trade role of immigration in terms of transaction costs reduction seems more appropriate when HIIT is involved, because the immigrants' knowledge of home country markets and available products should affect more *variety trade* than *quality trade*. On the other hand, the likely emergence of income differentials between immigrants and natives should activate more VIIT⁷⁴.

specialize in relatively high quality goods, while the one with a lower income, relatively labor abundant, will specialize in low quality goods.

⁷³ Empirical evidence of a positive effect of market size -measured by the average GDP- on IIT has been provided by Balassa (1986a), Balassa and Bauwens (1987) and Greenaway et al. (1994). For a positive effect on HIIT: Greenaway et al. (1994), Greenaway et al. (1999), Crespo and Fontoura (2004), Pittiglio (2009); on VIIT, among others: Greenaway et al. (1994), Stone and Lee (1995), Greenaway et al. (1999), Gullstrand (2001), Crespo and Fontoura (2004), Reganati and Pittiglio (2005), Pittiglio (2009).

⁷⁴ It is worth to observe that the lack of data for German emigration prevents us from a deeper analysis of the migration-IIT link, since, it precludes of testing a further facet that is the different impact on the two forms of IIT of inward and outward migration flows related to differences in human capital. Finally, it is necessary to consider the fact that using only immigration data could lead to an overestimation of the immigration's effect which could include the positive impact of emigration as well. Therefore, the results will have to be interpreted with caution.

4.3.3 Empirical strategy

As explained in chapter 3, since intra-industry trade index varies between 0 and 1, the method of ordinary least squares (OLS) is not appropriate and cannot be directly used for the model's estimate (estimated coefficients would not be efficient). In particular, Caves (1981) noted that OLS method has the disadvantage of not ensuring that predicted values of the dependent variable will be within its feasible range from 0 to 1. Hence, in order to overcome this problem we follow the empirical strategy adopted in literature by Loertscher and Wolter (1980), Caves (1981), Bergstrand (1983), Stone and Lee (1995), Blanes (2005), Reganati and Pittiglio (2005), Blanes and Montaner (2006). We use a logit transformation of the GL index and then we estimate the model by OLS:

$$\log\left(\frac{IIT_{it}}{1-IIT_{it}}\right) = \beta' X_{it} + \mu_{it}$$

where β and X are the vectors of parameters and explanatory variables, respectively.

Again we point out that the logit transformation rules out all observations where the *IIT* index takes values 0 or 1. Hence, some authors estimate a logistic function, using non-linear least squares (Greenaway and Milner, 1984; Balassa, 1986a; Balassa and Bauwens, 1987; Aturupane et al., 1999; Blanes and Martìn, 2000; Gullstrand, 2002; Blanes, 2005; Reganati and Pittiglio, 2005; Pittiglio, 2009). We do not apply this methodology since our database does not contain observations equal either to zero or to one for the dependent variable.

Finally, other authors use a Tobit model (Veeramani, 2002; Sharma, 2002; Byun and Lee, 2005; Pittiglio, 2009). We apply the tobit estimation as robustness check (see Appendix, table 4.2A).

4.4 The estimation results

The results of the estimation carried out for all of the product categories (CN 1-97) and the 66 countries of the sample are reported in table 4.1.

As far as TIIT is regarded, straightaway we can note that the model fits very well with the data since the explanatory power of the regression is quite high. Broadly in line with expectations, all of the coefficients have high levels of significance and the predicted direction of impact. Controlling for the economic mass and the transportation costs (the latter proxied by bilateral distance), Germany has a higher propensity to trade with European Union countries, as the positive and significant coefficient of the *eu* dummy suggests. The negative coefficient of *KLdif* means that countries more similarly endowed than others have a higher share of intra-industry trade on total trade. When equation (II) is estimated, the negative sign in front of the *KLdif* coefficient still remains and this result is not what we would have expected for VIIT regression. However, as already explained in the case of Italy, the inverse relationship between VIIT and relative capital endowment variable is not surprising if we look at the characteristics of countries instead of industry characteristics; data reveals that the most capital-intensive industries are those with less scope for product differentiation (chemical, food processing, etc.). Indeed, in order to capture quality differentiation in trade in a proper way, a proxy for relative human capital endowment would be more appropriate than the K/L ratio. Actually, studies on industry-specific determinants of VIIT found a positive relationship between human capital intensity variable and intra-industry trade in vertically differentiated products⁷⁵. Although these valid arguments, in the spirit of studies focussing on country-specific determinants of IIT, we have preferred to maintain the usual specification for the relative factor endowment variable.

⁷⁵ Greenaway et al. (1995) found a positive sign when VIIT is regressed on the share of non manual employment in total employment. Celi (1999, 2010) found a positive relationship between up-market VIIT and the ratio of non manual to manual workers. It is worth noting that both contributions are studies focusing on industry specific determinants of IIT. In other words, regressions are carried out across industries and not across countries, as we instead do in the present work.

**Table 4.1 - The impact of immigration on the German intra-industry trade
(logistic transformation of GL index – pooled OLS)**

	TIIT	VIIT	HIIT
imm	0.21*** (6.16)	0.20*** (5.98)	0.23*** (3.78)
KLdif	-0.25*** (-5.60)	-0.23*** (-5.02)	-0.30*** (-4.60)
size	2.03*** (12.17)	1.90*** (11.85)	2.62*** (10.02)
eu	0.68*** (5.70)	0.51*** (4.46)	0.98*** (6.13)
dist	-0.18*** (-3.12)	-0.15*** (-2.61)	-0.31*** (-3.27)
constant	-21.93*** (-10.04)	-21.14*** (-9.94)	-28.99*** (-8.87)
R square	0.4821	0.4274	0.3086
Obs	589	589	589

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

As predicted, a strong positive and statistically significant linkage between immigration and Germany's intra-industry trade with her partners is found over the period 2000-2009. It is worth pointing out that we also would have expected the effect of emigration on the IIT index to be positive, but due to the lack of stock data on German emigration we cannot investigate this facet empirically. However, what we can do is observe that the positive coefficient of the immigration variable is quite high. It could be related to different aspects: firstly, to the historical and dimensional importance of immigration in Germany; secondly, to the fact that recent immigration is more skilled than the past, therefore increasing the ability of migrants to transfer and share their knowledge about origin countries and to create new trade. Indeed, if we

agree with the notion of a positive relation between level of skills and effect on trade⁷⁶ we have to consider that recently people leave their country for Germany moved by different reasons with respect to the past, such as more vocational training and occupation possibilities and research of better work conditions (usually at bigger firms). They also try to do business and benefit from the potential of the receiving country, increasing the possibilities of creating trade. In addition, this high positive result could be due to the fact that the immigration's coefficient is capturing the potential positive effect of emigration as well.

As a whole, the finding of a positive effect of inward flow on the share of German TIIT supports the underlying idea that migration is able to trigger IIT through the knowledge brought by immigrants about the foreign markets and different social institutions as well as the business/personal contacts with their home countries⁷⁷.

With regard to the VIIT and the HIIT we find results in line with the prediction that migration has a different effect on the two types of IIT. Indeed, the impact on the VIIT and HIIT is different. In particular, one can note the immigration's effect grows with reference to the variety trade, even though slightly. This means that HIIT, as expected, is more sensitive than VIIT to changes in immigrant stocks. Specifically, we hold to be true the immigrants' positive effect on the *quality* trade (vertical IIT) is activated by income differentials between immigrants and natives; instead, the larger effect of immigration on horizontal IIT is just what should explain the network effect: the amount of knowledge about home countries, the migrants naturally embody, affects, as expected, trade in goods differentiated by attributes.

Then the estimation's results confirm that to not separate the TIIT in its two components leads us to underestimate the potential impact of migration on IIT since it rules out the effect on the horizontal intra-industry trade which is the biggest one, related to the network effect. In other words, the reached econometric results demonstrate that the separation of the two components of IIT is worth pursuing, leading to a better understanding of the phenomenon.

⁷⁶ For an analysis of the relationship between skilled migration and trade see, among others, Felbermayr and Jung (2009).

⁷⁷ The same model estimated by a tobit econometric strategy produces equal results in terms of signs and significance of the variables (see Appendix, table 4.2A).

4.5 Sensitivity analysis of the results

As already noted in this work, the theory does not dictate the appropriate specification, but it only lays down the guidelines about some variables that ought to enter the specification; hence, we have to check the robustness of the obtained results by estimating reasonable alternative specifications.

Similarly to the empirical study for Italy, we perform a sensitivity analysis for the set of explanatory variables. In tables 4.2, 4.3 and 4.4 we first investigate whether the effect of immigration on TIIT, VIIT and HIIT is sensitive to the set of transaction cost variables included in the specification of the model, *dist* and *eu* (columns II, III and IV) and, secondly, to the inclusion or not of the variable that measures differences in relative factor endowments, *KLdif* (columns from V to VIII).

This check is followed by several attempts to more deeply analyze the effect of immigration on the intra-industry trade indexes, by taking into account the different kinds of origin countries (tables 4.5, 4.6, 4.7, 4.8).

In table 4.2, one can note that if we do not include variables such as *dist* and *eu* and we do not control for the countries' factor endowments, the explanatory power of the regressions that rule out these variables is much lower than that of the estimates that do. In particular, when the variables *eu* and *dist* are omitted the value of the *imm* variable's coefficient grows. Therefore, not to include the variables relating to transaction costs and regional integration agreements would lead to overestimate the effect of immigration, which would capture the other country-specific effects. There would be the case of the omitted variable bias.

The columns VI to VIII correspond to columns II to IV, but the *KLdif* variable is dropped. Also in this case the only effect is an increase of the immigration's coefficient, but the sign of the relation remains the same.

Tables 4.3 and 4.4 show the results of the sensitivity analysis for VIIT and HIIT. Again, looking at our key variable, we reach the conclusion that the first specification of the model (Table 4.1) is the best one since it has the highest explanatory power and it does not suffer of omitted variable bias.

Table 4.2 - Sensitivity analysis for TIIT

	II	III	IV	V	VI	VII	VIII
imm	0.22*** (6.46)	0.24*** (7.59)	0.30*** (9.09)	0.25** (6.82)	0.28*** (7.45)	0.27*** (7.79)	0.34*** (9.80)
dist	-0.30*** (-6.42)	–	–	-0.16*** (-2.65)	-0.30*** (-6.06)	–	–
eu	–	0.89*** (9.59)	–	0.86*** (7.00)	–	1.03*** (10.31)	–
KLdif	-0.32*** (-6.54)	-0.20*** (-5.05)	-0.28*** (-5.30)	–	–	–	–
size	2.34*** (14.21)	2.15*** (13.08)	2.79*** (17.57)	2.57*** (14.32)	3.12*** (18.65)	2.64*** (14.86)	3.53*** (20.96)
const	-23.30*** (-10.40)	-25.37*** (-12.96)	-31.45*** (-15.60)	-30.43*** (-15.49)	-34.93*** (-18.30)	-32.66*** (-17.18)	-42.14*** (-23.65)
R ²	0.4658	0.4743	0.4385	0.4626	0.4395	0.4575	0.4172
Obs	589	589	589	613	613	613	613

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

Table 4.3 - Sensitivity analysis for VIIT

	II'	III'	IV'	V'	VI'	VII'	VIII'
Imm	0.21*** (6.23)	0.22*** (7.26)	0.26*** (8.58)	0.23*** (6.66)	0.25*** (7.22)	0.25*** (7.51)	0.31*** (9.31)
Dist	-0.24*** (-5.20)	–	–	-0.13** (-2.22)	-0.24*** (-4.99)	–	–
Eu	–	0.68*** (7.69)	–	0.67*** (5.86)	–	0.81*** (8.70)	–
KLdif	-0.28*** (-5.20)	-0.19*** (-4.67)	-0.25*** (-4.93)	–	–	–	–
Size	2.13*** (13.42)	2.00*** (12.70)	2.49*** (16.42)	2.42*** (14.00)	2.84*** (17.74)	2.47*** (14.44)	3.17*** (19.73)
Constant	-22.16*** (-10.17)	-23.92*** (-12.69)	-28.55*** (-14.79)	-29.10*** (-15.28)	-32.62*** (-17.61)	-30.90*** (-16.75)	-38.35*** (-22.30)
R ²	0.4170	0.4216	0.3979	0.4134	0.3974	0.4097	0.3815
Obs	589	589	589	613	613	613	613

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

Table 4.4 - Sensitivity analysis for HIIT

	II''	III''	IV''	V''	VI''	VII''	VIII''
imm	0.25*** (4.00)	0.29*** (5.22)	0.36*** (6.72)	0.18** (2.32)	0.23*** (2.93)	0.23*** (3.05)	0.35*** (4.95)
dist	-0.48*** (-6.25)	–	–	-0.30*** (-3.01)	-0.52*** (-6.03)	–	–
eu	–	1.34*** (11.04)	–	1.32*** (6.96)	–	1.64*** (10.17)	–
KLdif	-0.42*** (-6.24)	-0.23*** (-4.03)	-0.35*** (-5.03)	–	–	–	–
size	3.06*** (11.58)	2.82*** (10.70)	3.79*** (14.15)	3.62*** (10.14)	4.46*** (12.09)	3.75*** (10.48)	5.16*** (13.16)
constant	-30.97*** (-9.11)	-34.76*** (-12.09)	-43.89 (-14.60)	-41.72*** (-11.46)	-48.64*** (-12.93)	-45.94*** (-12.82)	-61.06*** (-15.89)
R ²	0.2966	0.3009	0.2725	0.2268	0.2143	0.2227	0.1992
Obs	589	589	589	613	613	613	613

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

As most IIT takes place between developed nations that have similar industrial structures, and international migration frequently involves a less-developed home country and a developed host country, the “North-North” direction of IIT and the “South-North” direction of international migration suggest to make an additional test for a deeper investigation of the relationship between migration flows and IIT. Such a test could be that which we performed for Italy. We remember that that test was strictly related to the fact that, in the case of Italy, home and destination country of migration flows differed from one another. Italy stood out because immigration and emigration were a South-to-North and a North-to-North matter respectively. By estimating all of the countries together, one might think that the effect of immigration on the Italian IIT

index was underestimated since the direction of IIT was North-to-North. For this reason we estimated the effects of immigrants coming from developed countries separately from those of immigrants coming from developing countries. We did the same for emigrants. In the specific case of Germany, instead, firstly, we know that this particular facet does not come up from the data, indeed, both immigration and emigration flows mainly involve OECD countries⁷⁸. Secondly, German data about migration we use in the econometric analysis refer only to immigration (because of the reasons already explained). Hence, one could expect that to test separately the effect of immigrants from OECD and non-OECD countries will not result this time into remarkable outcomes. Either way we decide to apply this test since we believe that it can contribute to improve the assessment and the interpretation of the previous findings.

To better identify the effect of the different kinds of migrants (those coming from OECD countries and those coming from non-OECD countries) we let the elasticity of trade for immigration vary among the two different groups of countries. Let us define a dummy variable which assume value 1 if the country is a member of the OECD, and if not, 0. On the contrary, the dummy named non-OECD takes value 1 if the country is not a member of the OECD and otherwise, 0. Finally, we introduce two interaction variables, one derives from the product of the OECD dummy with the immigration variable, and the other is the product between the non-OECD dummy and the immigration variable. These last two variables replace the stock of immigrants in the regression.

What we expect depends in part on the degree of similarity of trading countries. The literature on the migration-trade link suggests that the more dissimilar the countries are, the larger the positive effect of immigration on trade will be. Then, Germany being a developed country, we expect the information about the political, sociological and economic context brought by immigrants coming from developing countries will be more valuable and therefore, these immigrants will contribute more than others to increase the portion of IIT on total trade. Moreover, as already said, from the theoretical and empirical literature on the determinants of IIT, we know that the more dissimilar countries are, the less the share of IIT on total trade. Hence, it is necessary to consider this ostensible contradiction: on the one hand, the North-South trade supports the link

⁷⁸ In this regard, see section 4.2.1, graphs 3 and 4.

migration-trade, but on the other hand, the smaller share of IIT in the North-South trade does not support the link migration-trade. In order to avoid the composition effect it would be necessary to focus on the dissimilar migration flows' impact on the two components of IIT. For instance, one could predict a positive link between migration (South to North) and VIIT. This link is related to the presence of income differentials between immigrants and natives that could generate qualitative differentiation in trade flows (immigrants would trigger imports of low quality goods). Symmetrically, it could be supposed a positive link between immigration (North-to-North) and HIIT. In this case, because of a smaller difference in the income among immigrants and natives, the activation of the *variety* trade would prevail. It is worth pointing out that this argument perfectly strengthens the relevance of disentangling IIT in its two components, VIIT and HIIT.

Table 4.5 shows that immigrants from OECD countries compared to immigrants from non-OECD countries are those who have the greatest effect on IIT; this finding holds also when we disentangle the two components, vertical and horizontal. Hence, in contrast with literature, immigrants from the most dissimilar countries have the lowest effect on IIT. However, following our previous line of arguments, we concentrate on the estimations about the effect on the two components of IIT. Totally in line with the expectations, immigrants from non-OECD countries have a statistically significant impact on VIIT and immigrants from OECD countries have a bigger effect on the horizontal than vertical intra-industry trade.

As a whole, these results induce us to make some reflections. Probably, considering as developed countries those that are members of the OECD and as developing countries all of the others is not a proper procedure to follow in this case. Among OECD countries there are Poland, Czech Republic, Slovakia, Turkey and Hungary which are some of the main and historically important sources of immigrants living in Germany and which, according to the International Monetary Fund (IMF), are not developed countries. This could distort the findings and result in upward biases estimates in the case of immigrants from OECD countries (and consequently downward biases estimates in the case of immigrants from non-OECD countries)⁷⁹.

⁷⁹ It is necessary to note that among the non-OECD countries of our sample, Israel is a developed country according to the IMF classification. However, this does not affect the results since the migration from Israel to Germany is not remarkable.

Table 4.5 - The effects of immigration on TIIT, VIIT and HIIT by OECD Status

	TIIT	VIIT	HIIT
imm x OECD	0.16*** (4.54)	0.15*** (4.45)	0.17*** (2.69)
imm x nonOECD	0.07 (1.63)	0.07* (1.70)	0.06 (0.76)
size	1.04*** (4.87)	1.01*** (4.88)	1.37*** (4.59)
dist	-0.21*** (-3.82)	-0.17*** (-3.21)	-0.34*** (-3.72)
eu	0.46*** (3.89)	0.31** (2.73)	0.71*** (4.30)
constant	-10.82*** (-4.00)	-11.18*** (-4.22)	-15.10*** (-3.81)
R ²	0.5056	0.4489	0.3215
Obs	589	589	589

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

Actually, although it is theoretically true what suggested by the most literature that the more dissimilar the home and host countries' economies are, the more valuable the information brought by migrants is (and therefore the positive effect on trade increases), it is necessary also to take into account that the effect of migration on trade can be connected to the educational level of migrants. The higher educational level can

enhance the ability of migrants to transfer the information about their home country⁸⁰. Therefore our results could be reflecting this relationship. Immigrants from developing countries could be less educated than immigrants from developed countries and this would explain the lower effect on trade of the former compared with the latter. However, this facet needs to be verified⁸¹.

Table 4.6 shows the results that we obtain when the distinction OECD/non-OECD countries is replaced by that developed/developing countries⁸². In this case, immigrants from both developed and developing countries exert a positive and statistically significant impact on TIIT, VIIT and HIIT, signal that our first remark was valid, namely the imm-OECD variable, in table 4.5, was capturing the positive effect of immigrants from developing countries as well. Interestingly, in line with our expectations, we find that immigrants from developed countries activate more the horizontal than vertical trade and immigrants from developing countries have a more statistically significant impact on the vertical IIT.

Finally, since a relevant share of German trade flows involves the Central and Eastern European Countries (CEECs) due to the delocalization of production, and this kind of trade is not ascribable to both the horizontal and vertical trade, we could be interested in investigating whether when we distinguish between CEECs and non-CEECs countries the effect of migration on IIT will still result statistically significant. In other words, it is known that most of trade flows between Germany and CEECs consists of exchanges of intermediated goods activated by the delocalization of production, therefore, these exchanges are neither “quality” trade nor “variety” trade, although they are included in the VIIT flows when no distinction is made in the data between intermediated and final goods’ trade flows. So the question is: what impact does immigration from CEECs have on this kind of intra-industry trade? Or in other words, are immigrants from CEECs (and their knowledge about home country) still important in fostering German trade? The results reported in table 4.7 show that immigrants from CEECs even have a higher (positive) effect on IIT (both horizontal and vertical) than immigrants from non-CEECs (both developed and developing non-

⁸⁰ Empirical evidence in this direction comes from Felbermayr and Jung (2009).

⁸¹ Unfortunately, at the moment of writing, data on the educational level of immigrants by home country are not available for the analyzed period.

⁸² In order to separate developed from developing countries we have followed the indications given by the IMF.

CEECs). However, since the particular type of trade with the CEECs emerges more clearly when we separate the two components inside VIIT, we perform two further estimations in which the dependent variables are respectively HQVIIT and LQVIIT. Table 4.8 shows that the effect of immigration is still positive and statistically significant. In particular, immigrants from CEECs activate more the HQVIIT than LQVIIT. This finding is very interesting if we consider that exchanges between Germany and CEECs due to productive delocalization are captured by the LQVIIT⁸³. Hence, the higher effect of immigrants coming from CEECs on the HQVIIT gives support to the prediction according to which vertical trade is mostly caused by income differences between immigrants and natives (CEECs being lower income countries than Germany), whereas the positive effect on LQVIIT could be explained by the network effect, namely, the diffusion of additional information about their home country can contribute to increase the particular kind of trade existing between Germany and CEECs.

⁸³ The unit values of imports from CEECs are higher than the unit values of exports from Germany to CEECs, since Germany exports to CEECs goods which have to be processed there and then re-imported from CEECs with a higher added value.

Table 4.6 - The effects of immigration on TIIT, VIIT and HIIT by distinction developed/developing country

	TIIT	VIIT	HIIT
imm x developed	0.20*** (6.12)	0.19*** (6.00)	0.21*** (3.53)
imm x developing	0.24*** (6.00)	0.23*** (5.71)	0.30** (4.29)
KLdif	-0.29*** (-5.78)	-0.27*** (-5.20)	-0.40*** (-4.98)
Size	2.52*** (7.58)	2.39*** (7.25)	3.76*** (6.72)
Dist	-0.13** (-2.01)	-0.10 (-1.53)	-0.19* (-1.82)
Eu	0.75*** (5.75)	0.57*** (4.57)	1.14*** (6.45)
constant	-27.17*** (-6.92)	-26.32*** (-6.73)	-41.09*** (-6.47)
R ²	0.4840	0.4295	0.3122
Obs	589	589	589

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

Table 4.7 - The effects of immigration on TIIT, VIIT and HIIT by distinction CEECs/non-CEECs country

	TIIT	VIIT	HIIT
imm x CEECs	0.36*** (8.79)	0.35*** (8.52)	0.45*** (5.90)
imm x nonCEECs_ _developed	0.29*** (8.58)	0.28*** (8.54)	0.31*** (5.14)
imm x nonCEECs_ _developing	0.21*** (5.30)	0.20*** (4.96)	0.26*** (3.81)
KLdif	-0.13*** (-3.52)	-0.10*** (-2.79)	-0.20*** (-3.37)
size	1.89*** (6.49)	1.75*** (6.14)	3.00*** (6.12)
dist	0.08 (1.28)	0.12* (1.89)	0.07 (0.60)
eu	0.46*** (4.20)	0.29*** (2.77)	0.80*** (5.17)
constant	-24.11*** (-6.90)	-23.21*** (-6.72)	-37.39*** (-6.37)
R ²	0.5586	0.5170	0.3503
Obs	589	589	589

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

**Table 4.8 - The effects of immigration on HQVIIT and LQVIIT by distinction
CEECs/non-CEECs country**

	HQVIIT	LQVIIT
imm x CEECs	0.44*** (10.32)	0.19*** (4.28)
imm x nonCEECs_ _developed	0.36*** (10.75)	0.11*** (3.16)
imm x nonCEECs_ _developing	0.26*** (6.49)	0.06 (1.54)
KLdif	-0.03 (-0.96)	-0.22*** (-4.63)
size	1.31*** (4.68)	2.50*** (7.65)
dist	0.16** (2.34)	0.11 (1.56)
eu	0.23** (2.30)	0.48*** (3.93)
constant	-20.94*** (-6.10)	-29.40*** (-7.52)
R ²	0.4622	0.5429
Obs	589	589

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

4.6 Concluding remarks

This chapter has offered a further empirical test of the hypothesis that the stock of migrants helps to explain the share of intra-industry trade in total trade between the receiving and the sending countries.

Although the relationship between immigration and intra-industry trade was for the first time analyzed by Blanes (2005), our work makes additional contributions. In particular, the present empirical test paves the way for the assessment of the enhancing effect of migration on intra-industry trade using Germany as a testing ground, and extends the existing literature by examining separately the effects of migration on vertical and horizontal intra-industry trade, following the theoretical models that point to different determinants of the two types of IIT. We firmly believe this breakdown allows an accurate test of the specific determinants of HIIT and VIIT by removing the misspecification characterizing previous econometric models which had as their dependent variable total IIT.

The empirical strategy adopted here is the same we used in the previous chapter, for the case of Italy. In particular, the test has been realized using country-level data that combine the German intra-industry trade indexes and the stock of immigrants coming into Germany, for the period 2000-2009. In order to discriminate between the two forms of IIT, we have followed the procedure proposed by Greenaway et al., (1994; 1995) and mostly used in literature. The empirical model, we have employed, has been developed starting from the model by Hummels and Levinshon (1995) and revisiting it, also adding to the basic specification our key variable: the stock of immigrants.

The estimation's results have suggested that our hypotheses are consistent with the data. The core finding is that immigration exerts a positive and robust influence on the share of intra-industry trade between Germany and the partner countries in the sample.

With regard to the VIIT and the HIIT, we have found that the discrimination between the two components of IIT leads one to deeply investigate the link migration-IIT and improves the interpretation of the empirical outcomes. The results allow us to conclude that immigration, as predicted, has different effects on the two types of IIT. In particular, the immigration's effect on trade turns out to be more relevant when the *variety* trade (HIIT) is explicitly considered. This finding is in line with the prediction

that the immigrants' knowledge of their home country markets and available products should enhance more *variety trade* than *quality trade*.

When we deeply have explored the relationship between immigration and IIT by taking into account the distinction developed/developing sending countries we have found a higher effect on IIT (TIIT, VIIT, and HIIT) by immigrants coming from developing countries, supporting the theoretical prediction according to which as more dissimilar the sending and the receiving country are, the more valued the information brought by immigrants will be. Moreover, also this estimation has displayed different effects on VIIT and HIIT confirming the previous result of a higher impact on HIIT.

Finally, the robustness of our results also has come out when we have considered a situation in which we could expect an insignificant effect of immigration, namely when we have took into account intra-industry trade between Germany and CEECs (a trade mostly caused by international fragmentation of production). Also this further test has showed a "variety effect" alongside a "quality effect".

Therefore, our results have offered proof of a strong link between immigration and IIT, to some extent unexpected in light of the fact we have used a very highly disaggregated trade data and, unlike other studies, the IIT indices have been calculated using data which regard both trade in manufactured goods -where product differentiation predominates- and trade in primary commodities, which consists largely of standardized products.

It is worth pointing out that more comprehensive migration data would have allowed us to assess simultaneously the effects of immigration and emigration on IIT. Unfortunately, we do not have emigrants' stock data; hence, as already done, we have to acknowledge that the absence of one dimension of migration could lead to an overestimation of the effect of the other.

Alongside the lack of emigration stock data, we have to also consider that quality data on stocks of immigrants by country of origin are rather scarce, probably due to the fact that the issue of migration's influence on trade has attracted the attention of researchers only recently. This explains why it is quite difficult to find accurate databases and, in particular, disaggregated migration data. This lack of information leaves room for more adequate estimations when higher quality data will be available, and precludes to infer more detailed policy implications.

However, our analysis can contribute to inform the policy debate on the interplay between immigration and international trade. Indeed, although conventional wisdom is that European countries may gain much more from liberalization of trade than from liberalization of migration, and governments' policies are consistent with this public opinion's pattern -having been over years much more willing to open up their borders to trade than migration- this empirical study gives evidence of the benefits, in terms of IIT promotion, that a European developed host country, such as Germany, has from immigration.

APPENDIX

Table 4.1A - Descriptive statistics for sample

Variable	Mean value	Standard deviation	Minimum value	Maximum value
LOGIMM	10.59	1.23	8.42	14.51
LOGKLDIF	8.68	0.97	1.53	10.55
LOGDIST	7.72	1.05	5.64	9.68
LOGMEANGDP	28.05	0.36	27.57	29.82
<hr/>				
IIT	0.16	0.14	0.00006	0.55
HIIT	0.04	0.05	1.00e-14	0.29
VIIT	0.11	0.10	0.00006	0.39
VIITUP	0.07	0.06	0.00001	0.35
VIITDOWN	0.04	0.05	1.52e-07	0.22

**Table 4.2A - The impact of immigration on the German intra-industry trade
(Tobit estimation)**

	TIIT	VIIT	HIIT
imm	0.02*** (6.94)	0.01*** (6.70)	0.01*** (4.85)
KLdif	-0.03*** (-6.04)	-0.02*** (-5.54)	-0.01*** (-4.90)
size	0.17*** (11.40)	0.12*** (11.41)	0.05*** (7.63)
eu	0.07*** (6.16)	0.03*** (4.20)	0.04*** (7.78)
dist	-0.03*** (-5.89)	-0.01*** (-4.62)	-0.01*** (-6.01)
constant	-1.37*** (-7.05)	-1.02*** (-7.25)	-0.35*** (-4.37)
Log Likelihood	611.142	803.510	1135.759
LR Chi(2)	606.95	517.26	520.01
Obs	589	589	589

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

The positive effect of immigration on the intra-industry trade between Germany and the trading partners in the sample also comes out when we use a tobit estimation.

Table 4.3A - The impact of immigration on the German vertical and horizontal intra-industry trade (α fixed at 0.15 and 0.25)

	VIIT		HIIT	
	$\alpha = 0.15$	$\alpha = 0.25$	$\alpha = 0.15$	$\alpha = 0.25$
imm	0.20*** (5.96)	0.20*** (6.17)	0.26*** (5.15)	0.21*** (4.46)
KLdif	-0.23*** (-5.32)	-0.22*** (-4.96)	-0.28*** (-4.96)	-0.28*** (-5.16)
size	1.92*** (11.88)	1.88*** (11.93)	2.57*** (12.11)	2.37*** (12.00)
eu	0.55*** (4.46)	0.47*** (4.18)	0.97*** (6.48)	0.97*** (6.68)
dist	-0.16*** (-2.85)	-0.14** (-2.53)	-0.28*** (-3.57)	-0.30*** (-4.16)
constant	-21.12*** (-9.91)	-21.05*** (-10.04)	-29.49*** (-10.58)	-26.19*** (-10.50)
R square	0.4439	0.4190	0.4210	0.4420
Obs	589	589	589	589

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

In order to disentangle the vertical and horizontal components inside IIT, we have arbitrarily fixed $\alpha = 0.2$ in our previous estimations. Table 4.3A shows that our results are robust to different methodologies. Indeed, the same link between immigration and both VIIT and HIIT is found when we calculate the quality and variety trade fixing $\alpha = 0.15$ and $\alpha = 0.25$.

**Table 4.4A - The impact of immigration on the German intra-industry trade
(lagged variable)**

	TIIT	VIIT	HIIT
imm	0.20*** (5.55)	0.19*** (5.48)	0.20*** (2.96)
KLdif	-0.25*** (-5.26)	-0.23*** (-4.71)	-0.33*** (-4.30)
size	1.99*** (11.52)	1.85*** (11.29)	2.59*** (9.28)
eu	0.77*** (6.12)	0.61*** (5.08)	1.06*** (6.05)
dist	-0.16** (-2.5)	-0.12** (-1.97)	-0.29*** (-2.75)
constant	-21.56*** (-9.43)	-20.78*** (-9.41)	-28.35*** (-8.02)
R square	0.4833	0.4313	0.2974
Obs	531	531	531

Note: ***, **, * indicate significance at the 1, 5, and 10 percent level respectively. All estimations include time dummy variables. t-values are given in parentheses.

In order to control the direction of causality, we have estimated a model where immigrants have been replaced by their lagged. Results have revealed that the pro-IIT impact does not change with the predetermined variable; hence we can conclude that the direction of causality we assumed in this work is correct.

Chapter 5

CONCLUSIONS

5.1 The role of migration in intra-industry trade

In this thesis the role of international migration in the intra-industry trade between host and home countries has been empirically investigated.

In the second chapter we have reviewed the theoretical and empirical contributions necessary to define a proper framework for our analysis. In this aim, we have put together two specific strands of literature, that which studies the determinants of intra-industry trade and that which investigates the relationship between international migration and trade. The former identifies a strong negative link between international transaction costs and intra-industry trade (Loertscher and Wolter (1980), Kim (1992), Clark (1993), Stone and Lee (1995), to name but a few). Moreover, developments of this literature have led to the birth of models which explain, inside the two-way trade, the *quality* trade separately from the *variety* trade, showing that different forces may act in the two cases. For our purpose, we have highlighted the branch of research which has studied the qualitative differentiation of product as determined by income differences (Falvey and Kierzkowski, 1987; Flam and Helpman, 1987; Gullstrand, 2001).

The second and more recent strand of literature, that we have reviewed, has identified a positive connection between international migration and bilateral trade between home and host countries. According to this literature, the positive influence of migration on trade basically acts through two mechanisms: *preferences* of migrants for the home country's products, and *information* that migrants have about products, markets and institutions of their home country. Information is very important, above all if one consider the fact that empirical literature has shown that the lack of trust between trading partners, who have cultural differences and habits, or insufficient information on the quality and reliability of products, can explain a part of the missing trade (den Butter and Mosch, 2003). In this regard, migrants may function as intermediary and increase the degree of trust between trading partners. Actually, empirical research has found

large evidence about the relevant role of ethnic networks (information-sharing groups) in fostering trade.

Moreover, a number of studies have shown a higher positive effect of migration on trade in differentiated goods than homogeneous goods (Gould, 1994; Rauch, 1999; Rauch and Trindade, 2002; Bettin and Lo Turco, 2009; inter alia). Therefore, empirical evidence seems to suggest a positive relationship between migration and intra-industry trade, in particular, due to the positive effect of migration on the reduction of trade transaction costs to which IIT is more sensitive than inter-industry trade. Although research has been pushed in this direction, to the best of our knowledge, this issue still turns out to be little explored, above all with reference to the analysis of the migration's role in presence of vertical and horizontal product differentiation.

In this regard this thesis represents a development of the recent literature dealing with the effect of international migration on trade, by offering original contributions. Firstly, unlike the majority of studies which only take into account the role immigration, the present work has analyzed the effects of both immigration and emigration since, as the network theory suggests, when there are differences in the human capital, one can suppose different effects on IIT by immigration and emigration. Secondly, the investigation has been realized separately for VIIT and HIIT, because different effects of migration on these two forms of IIT were expected. The underlying insight has come from the two strands of literature recalled above. Specifically, the theoretical prediction, according to which distribution of income within countries and per capita income differences between countries are the major explanatory factors behind vertical IIT, has led us to forecast a positive effect on the VIIT between two countries (sending and receiving country) when immigrants and natives have different incomes. Instead, following what the literature on the link migration-trade postulates, the information channel, by means of which migrants are able to bridge the informational gap between their home and host country, is expected to matter greatly for the *variety* trade.

Both underlying ideas of this work have been perfectly supported by the empirical analyses performed for Italy and Germany.

5.2 The Italian experience of the migration-IIT nexus in the presence of vertical and horizontal product differentiation

The third chapter of this thesis has dealt with the first empirical case of our analysis. It has investigated the predicted positive relationship between migration and IIT for Italy, over the period 2005-2010.

The estimated model has explained the share of bilateral intra-industry trade on total trade by the stock of migrants (both immigrants and emigrants) other than by the traditional factors identified by literature as determinants of IIT. Such a defined model has been applied to the intra-industry trade between Italy and its main home and destination countries of migration, which include both developed and developing countries. We have estimated three models characterized by the same explanatory variables, but different dependent variables (TIIT, VIIT and HIIT) since our goal was to explore the relationship between migration and the two components in IIT.

The computation of the share of IIT in total trade has been done by using the G-L index; whereas VIIT and HIIT have been calculated following the methodology by Greenaway et al. (1994; 1995), but using a higher level of disaggregation of trade data (8-digit) in order to better identify the share of trade due to the qualitative differentiation of product. However, such a high level of disaggregation reduces the share (in absolute value) of intra-industry trade in total trade.

Although the use of highly disaggregated data, high coefficients have been reached for our variables of interest. More in detail, we have found that immigrants more than emigrants have a positive and statistically significant effect on the share of Italian bilateral intra-industry trade, and this finding is robust to several tests. However, results worthy of attention are those relating to the effect of migration on VIIT and HIIT. We have found that emigrants affect only the HIIT, whereas immigrants activate both VIIT and HIIT. The different coefficients found for each flow of migration on the two forms of IIT strongly support our prediction of a diverse impact in presence of vertical and horizontal differentiation and, therefore, the necessity of separate estimations. We have reached the same conclusion when an additional test has been performed in order to take into account the presence of differences in human capital between migratory flows coming from and going to OECD and non-OECD countries. In particular, this test has brought to light relevant facets on the relationship migration-IIT. Firstly, immigrants

from OECD countries trigger only the *variety* trade, whereas immigrants from non-OECD countries activate both *quality* trade, due to income differences between immigrants and natives, and horizontal trade, thanks to the information they have about their home country. As far as emigration is concerned, very interesting results have stood out. The separation between emigrants moving to OECD countries and emigrants moving to non-OECD countries has shown that emigrants who go to non-OECD countries are the only ones who have a positive and statistically significant impact on IIT, specifically on HIIT. The additional contribution of this finding lies in the fact that it permits us to understand that there is not only a consumption effect, as one could suppose on the basis of the previous result of a positive link between emigration and HIIT, thinking of the relevant presence of Italians in the industrialized countries and to what the IIT literature states according to which similar countries mainly activate variety trade (HIIT). Specifically, this test has induced us to reflect on the kind of emigrant who goes towards non-OECD countries. An explanation we have proposed of the obtained result (which, however, needs to be empirically tested) has been that the greater positive effect on the HIIT by emigrants could be related to their educational level. Indeed, it is well-known that the Italian who moves to developing countries usually is an entrepreneur able to activate trade thanks to his professional skills and knowledge about his home country. We know that both preferences and information affect the *variety* trade, but in this specific case, in which non-OECD countries are considered, the information channel prevails.

The choice of Italy, as one of the two empirical cases to be studied, has, therefore, turned out to be right for our purpose. Indeed, the peculiar characteristics of Italy's migration flows have revealed interesting aspects with regard to the migration-IIT link. Firstly, data have totally given support to our insight of a different impact by immigration and emigration due to differences in human capital. Italian emigrants are, nowadays, more skilled than immigrants arriving in Italy and their higher educational level can increase the ability to diffuse and transfer valued information which can reduce trade transaction costs. Secondly, immigrants in Italy mainly come from less developed countries, whereas Italian emigrants move to developed countries. This particular facet justifies our prediction of a different effect on VIIT by immigration and emigration. Income differences, arising between immigrants and natives, should activate

VIIT, and this is exactly what we have found. Therefore, a comprehensive investigation of the migration-IIT nexus cannot overlook the likely differences in human capital between immigrants and emigrants, and, above all, cannot ignore the different impact on the two components of IIT which, for this reason, must be studied separately.

5.3 The empirical case of Germany

In the fourth chapter we have explored the existing relationship between migration and intra-industry trade in the specific case of Germany.

Firstly, we have looked at the history and composition of migratory flows in Germany, underlining the strong presence of immigrants in the German labor market. We have observed that, over time, also emigration from Germany has grown, but immigration still remains the most important component of migratory flows.

Subsequently, we have estimated the effect of immigration on the portion of intra-industry trade between Germany and the major sending countries of immigrants. In order to do this, we have employed the three models built in chapter 3, in which the dependent variables were TIIT, VIIT and HIIT, respectively. However, unlike our anchor empirical models (those estimated in chapter 3), in the models estimated in chapter four there has not been included the emigration variable among the explanatory factors, since, unfortunately, no data about the stock of German emigrants by receiving country were available. Nevertheless, the lack of this kind of data has not prevented us from reaching our goal. After all, from the analysis of migratory flows in Germany there has come out that both immigration and emigration mostly involve developed countries (59% and 69%, respectively) and this facet has induced us to believe that, in this specific case, there are no relevant differences in human capital between immigrants and emigrants to expect significant differences in the coefficients of these variables. Certainly, the interpretation of the obtained results has been done with caution, namely, taking into account that the immigration variable might be capturing the (positive) effect of emigration as well.

Estimation's results have shown that, also for Germany, the basic idea of a positive and significant relationship between immigration and intra-industry trade finds support in the data. In this regard, worthy of note is the finding related to the effect of

immigration on the two forms of IIT. Again we have found that VIIT and HIIT are differently affected by immigration. In particular, the *variety* trade is more positively influenced than the *quality* trade by the presence of immigrants, by means of the network effect.

In the last part of chapter 4, some additional models have been estimated in order to deeply evaluate the role of immigration on intra-industry trade and test the robustness of our findings. In particular, after some tests of sensitivity of the results to certain variables, we have checked if a different effect on IIT came out from the data when we distinguished by home countries involved by migration. The first check based on the distinction OECD/non-OECD countries has needed to be backed up by additional tests in order to reach a better assessment of the issue. Indeed, such a test has revealed a positive and significant effect on both VIIT and HIIT only for immigrants coming from OECD countries, whereas immigrants from non-OECD countries have turned out to significantly affect only VIIT. Certainly, this last finding is in line with our expectations, according to which, in presence of income differences between immigrants and natives, the *quality* trade will be activated more than the *variety* trade, but we expected these immigrants to affect also HIIT due to the importance of information they bring about their home country (which is supposed to be dissimilar from Germany). Hence, we made an additional test in order to investigate whether our results were somehow affected by the fact that among the OECD countries are included Poland, Czech Republic, Slovakia, Turkey and Hungary, which are some of the main and historically important sources of immigrants living in Germany and which, according to the International Monetary Fund (IMF), are not developed countries (so they are economies dissimilar from Germany). Data gave evidence that our insight was right. Indeed, by replacing the distinction OECD/non-OECD countries with that developed/developing countries, also immigrants from developing countries turned out to exert a positive and significant influence on both VIIT and HIIT.

Finally, we have performed a further interesting test, in order to investigate whether the effect of immigration on IIT is still positive and significant when we consider immigrants from certain sending countries. Specifically, given the relevant presence of a particular kind of trade between Germany and CEECs, ascribable neither to vertical nor to horizontal IIT (because it consists of exchanges of intermediated goods activated

by the delocalization of production), but in some way captured by the *quality* trade when VIIT is opportunely divided in HQVIIT and LQVIIT components, we have explored the effect on VIIT by distinguishing between immigrants from CEECs and immigrants from non-CEECs countries. What we have found is noteworthy: immigrants from CEECs activate more the HQVIIT than LQVIIT. Once again, empirical evidence gives support to the prediction according to which vertical trade is mostly caused by income differences between immigrants and natives (in this case immigrants from CEECs have a lower income than Germans). The positive effect on LQVIIT, instead, could be interpreted as an additional proof of the network effect, namely, the delocalization of production increases thanks to the presence of immigrants that give productive information.

5.4 Comparing Italian and German experiences

As it came out right from the introductory chapter, the choice of the two anchor countries of this research has not been random, but it has deliberately been done on two European powers, Italy and Germany, due to several reasons. First of all, they are two countries strongly involved by the migratory phenomenon, a fact, this one, relevant if one consider the subject of our study, namely the investigation of the effects of migration on intra-industry trade. On the other hand, the comparison between Italy and Germany cannot be escaped, since mass media always refer to Germany as a benchmark, to such a degree that the economic reliability of Italy is evaluated with respect to the parameters of German stability and productivity.

Although joined by the strong presence of immigrants, however, Italy and Germany present remarkable differences from a social and economic standpoint. These differences are observed with regard to the legislative body, economy's performance and also with reference to the integration policies and characteristics of foreign population living in their territory.

From the economic point of view, Germany personifies the so-called "strong" European model; instead, Italy is what many people consider the "weak" European model. Germany is an economy built in such a way to be structurally in trade surplus, with exports much higher (in value) than imports. It is a country that, over the years, has

stockpiled trade surpluses with the rest of the world, Europe included. In particular, it is the only Western Country to have registered active balances of trade with China. Therefore, it is an extremely competitive country. The secret of its competitiveness lies in a number of factors, such as, high wages, existence of a very powerful trade union movement, a high level of public services (e.g. education and healthcare) and strict rules in theme of environmental conservation. Moreover, Germany is an example of a country that has not downsized its standard of living in the first phase of the competition with China. Its model of development, hauled by exports, is linked to the attachment that Germans have for the *strong currency*, which is the bond that ensures that the German economic system does not base its competitiveness (with respect to the extra European monetary union countries) on low prices, but on high technology, quality and reliability of its products. Its strength is, therefore, the level of global investment in research and innovation. Finally, it is worth noting that it is a country where for a high standard quality of social services people are willing to pay the price in the form of taxes, so it is a country where there is a very high social capital.

On the other hand, there is Italy (along with Greece and Spain) which is identified by the rest of the world (especially from America) as an example of not virtuous European social model, in which social capital is low, although empirical studies have clearly displayed that the Italian social capital differs by areas, in particular, northern Italy is better endowed with social capital than southern (e.g. Helliwell and Putnam, 1995).

It should be noted that the German model of development, driven by exports, requires a high level of savings (because to export more than you import it is necessary to produce more than you consume). Then in this regard, our analysis turns out to be very helpful in showing the crucial role of immigrants in boosting the domestic demand that has been stagnant for a long time. Indeed, our study clearly displays that immigrants are able to increase trade in differentiated products (by quality and attributes).

As far as the migratory phenomenon is concerned, nowadays, Germany and Italy (along with many other industrialized countries) share the characteristic that a significant portion of their population is foreign-born.

Germany, with respect to Italy, is statistically the most ancient country of immigration, so when we refer to Italy we often talk about the “new” country of immigration. Actually, Italy is no longer a “new” country of immigration since more than thirty years have passed from the early flows. It is certainly “new” compared to Germany, where the beginning of the inflow of immigrants took place over half a century ago. In addition, in Germany, the relevance of immigration is also observed with reference to the greater number of years stayed⁸⁴. This would explain the greater integration of immigrants in Germany than in Italy.

Italy stands out from Germany for a more polycentric composition of immigrants, who come from all continents. In fact, while in Germany the predominant presence of Turks is known (equal to a quarter of the total), in Italy there are many sizeable communities of Romanians, Albanians and Moroccans (although Romanians are emerging as the most predominant), followed by other groups, whose presence is not as large as that of the aforementioned countries, but still substantial: Ukraine, China, Philippines, Tunisia, India, Peru, Ecuador, Egypt, Senegal, Moldova and Sri Lanka. Immigration in Italy, therefore, involves the four continents (Europe, Africa, Asia and America), numerous languages, cultural traditions and major religions of the world. Moreover, in Italy the South-North direction of migration is more pronounced than in Germany (Pittau and Di Sciullo, 2008).

Germany and Italy also differ, with regard to the recognition of being a country of immigration, which in Italy happened with the Martelli Law of 1990. Germany instead took more time to reach the same conclusion. Initially, immigrants were considered as “guest workers” (*Gastarbeiter*). It was only later, with the entry into force, in 2005, of the new German immigration law, that Germany has acknowledged itself as being a country of immigration, and migration policy based on the rotation has given way to one integration-oriented.

Italy and Germany are, therefore, countries in which the structural dimension of contemporary and future society is characterized by immigrants, and consequently, they should move in the direction of a greater integration of immigrants and strengthening of

⁸⁴ In Germany, in 2006, the average years stayed by immigrants were found to be nearly 17 for all immigrants (about 24 for the Italians). Still in 2006, 84% of immigrants appeared to live on site for more than 5 years (and among them 72% over 10 years), whereas, in Italy only half of the immigrants had five years of residence (Caritas/Migrantes, *Dossier Statistico Immigrazione 2006*).

relations with emigrants abroad⁸⁵, especially in light of the fact that the present work has shown the two-fold key role of migrants in fostering trade. On the one hand, large attention has been drawn on the role of migrants as bearers of knowledge -that knowledge able to reduce the costs of international trade- and thus promote the bilateral trade ties between home and host countries, in particular, the ties of intra-industrial type (HIIT). On the other hand, the income differences among immigrants and natives are the cause of a *quality* intra-industry trade (VIIT).

Hence, recalling the three research questions of this thesis:

- 1) Does migration help to increase intra-industry trade?
- 2) Does migration have a different impact on vertical and horizontal intra-industry trade?
- 3) Do the trade effects of immigration and emigration have different magnitudes?

The two empirical analyses, presented in chapters 3 and 4, induce us to give them affirmative answers. Firstly, the pro-IIT effect of migration is quantitatively important, and this holds for both Italy and Germany; secondly, empirical evidence (both Italian and German) has given strong support to the relevance of disentangling IIT in its two components, VIIT and HIIT, showing that different causes take action; thirdly, in the presence of differences in human capital, the positive effect of both inward and outward migratory flows can have a dissimilar magnitude (Italian data having shown a higher impact by immigrants than emigrants).

In addition, with respect to Italy, from the analysis realized for Germany it has come out a very interesting facet: the *information effect* helps to facilitate the German delocalization of production in the CEECs.

Therefore, a positive message, in terms of policy, comes to light: a country can benefit from international migration, with reference to its positive influence on the intra-industry trade of the involved countries, despite the public opinion still is not so much in favor of foreigners' mass entrance (as demonstrated, for instance, by the recent referendum in Switzerland by means of which the population has expressed its own will of reintroducing a yearly cap to the inflow of migrants).

⁸⁵ Positive in this sense is, for instance, the role of cultural mediator in Italy, which, compared to traditional structures, such as the protection of charitable institutions, is less technical and more cultural.

5.5 Agenda for future research

Although this thesis has provided a comprehensive analysis of the effect of migration on the share of bilateral intra-industry trade on total trade, there is a number of other facets that could be analyzed in future studies and some improvements which could be applied to the empirical strategy.

As we have already mentioned in the course of this work, in the specific case of Italy, a weakness of the investigation arises because the Italian emigration data by destination country from AIRE are unavailable before 2005; therefore, the analysis was confined to 2005-2009. For the future it could be thought of using a different source of data about emigrants. It could be helpful, for instance, to resort to the foreign electoral rolls, in order to extend the period of analysis.

Furthermore, the interpretation and the robustness of the results concerning the effect of migration on VIIT and HIIT could be improved by testing the two components of IIT on the basis of trade data, which distinguish final goods from intermediate goods. The use of these trade data will probably improve the interpretation of the results when we test the effect of migrants coming from and going to developed countries separately from the effect of migrants coming from and going to developing countries, since it will make it possible to catch the share of vertical IIT caused by the fragmentation of production and to isolate the positive effect on “real” VIIT due to migration.

Moreover, the models estimated in our two empirical analyses are built by using country-specific variables. Following the predictions of literature, according to which IIT can be explained also by industry-specific determinants, a new model could be tested. In this further model, industry-specific variables will be employed next to country-specific variables.

In addition, the robustness of the results could be tested also by extending the analysis to other countries, those which are characterized by low flows of migrants coming from and going to Italy and Germany⁸⁶.

Nevertheless, the agenda for future research needs to also include the investigation of the relationship between migration and other forms of internationalization, since this further analysis could lead to derive additional policy implications. For example, if from

⁸⁶ With the expression “low flows of migrants” we are referring to a flow (inward or outward) less than 1000 units.

the study dealing with the FDI-migration link there comes out a relation of substitutability, then, politics that boost outward FDI can be thought of, in the aim of containing excessive inward migration flows. Clearly, in this case, we are not talking about trade, but FDI, and the direction of the link is opposite: from FDI to migration flows. This is only one example of the importance of analyzing the link between migration and other forms of internationalization, also in terms of richness of policy implications.

Finally, our findings let us foresee the existence of a positive correlation between education and (positive) effect of migration on IIT. Hence, this insight leaves room for an additional test in which migrants are distinguished by education (low-skilled, medium-skilled and high-skilled).

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