Prin 2007 PUE PIEC

Politiche dell'Unione Europea, Processi di Integrazione Economica e Commerciale ed esiti del negoziato Wto

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Giulia Bettin *(Parthenope University, Naples)* and ***Alessia Lo Turco*** *(Polytechnic University of Marche)*

Working Paper 10/15

UNIVERSITÀ DELLA CALABRIA

ROMA TRE UNIVERSITÀ DEGLI STUDI

Prin 2007 PUE PIEC

is a Research Project on *"European Union policies, economic and trade integration processes and WTO negotiations"* financed by the Italian Ministry of Education, University and Research (Scientific Research Programs of National Relevance, 2007).

Information about the project, the partners involved and its outputs can be found at

http://www.ecostat.unical.it/anania/PUE&PIEC.htm.

A Cross Country View On South-North Migration And Trade. Dissecting the Channels.*

Giulia Bettin† and Alessia Lo Turco‡

September 27, 2010

Abstract

We explore the nexus between North-South trade and migration in a cross country framework over the period 1990-2005. In addition to the relatively unexploited cross country framework, our main contribution resides in the search for heterogeneous responses of trade to migration according to different good typologies. Besides the usual distinction between homogeneous and differentiated products dictated by the information channel, we also investigate the effects of migration on trade in primary and final goods and in labour and capital intensive goods with the purpose to assess the preferences and technology channels too. Our results show that, as expected, migration enhances the imports of primary and final goods (preferences channel) and the exports of differentiated-low elasticity of substitution goods (information channel). On the other hand, there is some evidence that the increase in the presence of migrants from the South enhances the export of labour intensive goods (technology channel).

JEL Classification: F22, F16.
Keywords: trade, migration, North-South.

*Financial support received from the Italian Ministry of Education, University and Research (Scientific Research Programs of National Relevance 2007 on European Union Policies, Economic and Trade Integration Processes and WTO negotiation-PUE&PIEC) is gratefully acknowledged.

†Department of Economics - Universitá di Napoli Parthenope - Via Medina 40, 80133 Napoli - g.bettin@univpm.it.

‡Department of Economics - Universitá Politecnica delle Marche - P.le Martelli 8, 60121 Ancona, Italy Tel. +39 071 2207250 - a.loturco@univpm.it.

1 Introduction

The recent wave of globalization is characterised by the growing role of developing and transition economies in the international production networks. The trade integration process brought ahead in the 1990s by the Uruguay Round and by the spur of several Regional Integration Agreements between developed and developing nations has stimulated the overall growth of North-South trade in manufacturing products. Moreover, the current globalization wave is represented by the dramatic decrease in communication and transportation costs. Crossing borders has become easier, and despite the deepening of political and economic integration in Europe and America has aimed at limiting migration, the latter has actually increased. The prospect of higher real wages and the fall in "mobility" costs has allowed for the balance between the costs and the benefits of migration to lean in favor of migration from the South to the North and this is more so for educated workers (Iranzo and Peri, 2007).

Despite labor flows are less pronounced than trade flows, the former have proved to be substantial in the recent decades and may actually have had important consequences. The aim of this paper is to use recently available data on migration into the OECD countries from developing and transition economies combined with bilateral trade information in order to uncover possible complementarity/substitution relationships between trade flows and labor mobility.

The theory supports both kind of relations: due the network effects, migrants can importantly lower the information costs of trade (Rauch, 2001). Moreover, their preferences for home products can affect the receiving country's imports of particular goods produced in their countries of origin. On the other hand, the employment of foreign born workers in manufacturing production in the North may also affect the North-South trade specialization pattern either strengthening or reducing bilateral trade relations, depending on the theory hypothesis. The empirical evidence on the topic is mainly based on country case studies and generally confirms a positive effect of migration on trade. However, despite the importance of distinguishing among good typologies when investigating the relationship between trade and migration[1] only a few studies, mostly country-level ones, address the issue on the basis of different good categories - homogeneous and differentiated - after Rauch's work on the network channel of trade (Rauch, 1999, 2001; Peri and Requena, 2009; Tai, 2009). The present study contributes to the existing literature

[1]Toniolo (1999) discusses how complementarity/substitutability can depend on the degree of technological content, sector specificities and cultural aspects and these features are not homogenous across goods.

in several directions: first of all, we provide a cross country view on the relation between bilateral trade and migration, namely considering trade and migration between the industrial OECD countries and the rest of the world; secondly, we try to shed more light on the different channels through which migration may affect trade looking in depth at the information, preference and technology channels.

The present study contributes to the existing literature in several directions: we provide new cross country evidence on the relation between bilateral trade and migration exploiting a North-South framework. Secondly, we try to shed more light on the different channels through which migration may affect trade looking in depth at the information, preference and technology channels. Aside the traditional distinction between homogeneous and differentiated products, we also test the effects of migration on preferences and trade costs by means of two further good classifications. Making use of the BEC "end-use" disaggregation, we distinguish the categories of primary and final goods which are supposed to be the most affected by the preference of immigrants for home country products; furthermore, following Romalis (2004), we classify traded goods according to their capital intensity and build two different aggregates (capital vs. labour intensive goods) to test whether the flow of people from South to North may actually shape specialization reducing trade, namely Northern exports, of capital intensive goods and increasing on the other hand Northern exports of labour intensive goods. Finally, the availability of three different years of observations on migration (1990, 2000, 2005) allows for investigating the link across a large span of time (Collins et al., 1999) and to test for the strict exogeneity of migration.

The work is structured as follows: the second section deals with theoretical and empirical literature on the topic; section three describes the data on trade and migration into OECD countries; section four presents the empirical model and discusses estimation issues; section five exhibits the results and the final section deals with the conclusions from the analysis.

2 The theory and the evidence on trade and migration

From the Hecksher-Ohlin framework comes Mundell's (1957) result that trade and migration are substitutes. Trade is explained through the different relative returns to production factors at home and abroad and any impediment to trade allows for factor movements across the borders.

In a specific factor model, with skilled and unskilled labor being the spe-

cific factors and capital the mobile one, migration of skilled labor from the unskilled labor abundant country releases resources to the unskilled labor intensive sector thus fostering this country's specialization and exports in the unskilled labor intensive goods. On the other hand, the increase in the availability of skilled labor in advanced countries would foster production and exports in the skilled labor intensive sectors. The result is for a complementarity relationship between trade and migration.

In the same direction, Markusen (1983) shows that removing the original assumptions of the H-O model, trade and factor movements can be complements[2]. Partially in this line, Iranzo and Peri (2007) extend a model of trade in differentiated products to analyse migration and trade jointly in a world where countries use different skill-specific technologies and workers have different skill levels. In their view, the brain drain from the South expands production and trade thus benefiting all the partners. Furthermore, the model is calibrated on East-West relationship in Europe to analyse the effects of reducing the barriers to labor mobility between the two regions when trade is free: mostly highly educated people would migrate to the West and thanks to this, GNP would increase in both regions and this would also positively affect trade.

Venables (1999) further explores the relationship between trade and migration in models with increasing returns and cumulative causation and here the final outcome is for a full agglomeration of production in one of the two economies.

While from the technology side the theory allows both for a positive or negative effect of migration according to the initial assumptions, the direction of the effect is less dubious for the network channel. As a matter of fact, some relatively more recent contributions explore the network dynamics to explain the relation between migration and trade (Rauch, 2001; Rauch and Trinidade, 2002; Rauch and Casella, 2003): migrants are very tied to their own culture and once abroad their demand for home products stimulates trade. Moreover, the presence of migrants in manufacturing firms could contribute to lowering the information costs for the owner to establish safer contacts with foreign firms and engage, for example, in the exchange of intermediate goods. Rauch and Trinidade (2002) show, for example, that ethnic

[2]Assuming identical factor endowments in both countries and removing the hypothesis of 1) identical technologies, 2) constant returns to scale, 3) perfect competition, 4) absence of domestic distortions, and 5) identical homothetic preferences, if a country is more advanced in the production of one of the two goods, trade will cause the country to export this good and the return to the factor intensively used in this sector will increase compared to the other country. This will foster the inflow of the factor from the trading partner and hence trade will continue to expand.

Chinese networks contribute to increase bilateral trade and this is especially valid for differentiated products compared to homogeneous ones.

The empirical evidence on the topic is quite recent and mainly based on country studies which consider trade and migration flows between a single country and the rest of the world. What emerges is the general result of a positive relation between migration and trade.

The pioneer work by Gould (1994) shows that immigrant links have historically been important in increasing bilateral trade flows between the United States and immigrants' home countries: immigrants not only bring their preferences for home country products, but also useful information and links to enter the foreign market. The focus of the study is on U.S. trade with other 47 economies, mainly high-developed countries, and results show that the trade-enhancing effect is stronger for imports than for exports.

For Canada, Head and Ries (1998) document that the presence of immigrants fosters exports and imports to and from their country of origin, namely a 10% increase in immigrants is associated with a 1% increase in Canadian exports to the immigrant's home country and a 3% increase in imports. These results are confirmed more recently by Partridge and Furtan (2008), who estimate the effects of immigration waves on Canadian trade flows, by province. They find evidence that immigrants affect imports of goods from their home countries after 5-10 years from arrival, while it takes them approximately 10-15 years to affect exports from Canadian provinces to their home countries. Provincial Canadian trade data are also used in Wagner et al. (2002) showing again that the average new immigrant contributes to expand imports from the home country by 944$ and exports by 312$.

Girma and Yu (2002) consider U.K. trade flows with 48 countries for the period 1981-1993 and show that immigration from non-Commonwealth countries plays a significant export-enhancing role for the U.K. economy. On the other hand, immigration from Commonwealth countries is found to have no substantial impact on exports; they read these contrasting results as evidence that the immigrant-link is not universal since its enhancing effects on bilateral trade work mainly through immigrants' personal and business contacts with the home country. Concerning imports, the study reveals a pro-import effect of immigration from the non-Commonwealth countries, while it is interesting to notice that immigration from the Commonwealth reduces imports, perhaps reflecting trade-substituting activities by immigrants. Ghatak et al. (2009) focus on trade between U.K. and the Central and Eastern European countries and show that migration positively affects (bilateral) exports of the migrants home country where there is not such a significative impact on imports.

With respect to the previous contributes, Tai (2009) looks at the market

structure as a further channel for migration flows to impact trade by means of a monopolistic model with a multi-sector economy (Chaney, 2008). The empirical analysis based on Swiss data shows that a 10% increase in the stock of immigrants implies a 0.8% change in preferences towards home country products and a reduction of 1.1% in trade costs. In turn, a 10% change in preferences and trade costs induces a +20% and -15%, respectively, in trade flows. The theoretical model implies that the effect of preferences on trade increases with the sector-specific elasticity of substitution (σ), since homogeneous products can be replaced more easily for a given level of preferences. On the other hand, the negative impact of costs on trade decreases with the elasticity of substitution thanks to the extensive margin of trade. As a result, migration has a greater impact on preferences in differentiated sectors, whose goods could be more easily distinguishable by country of origin with respect to homogeneous ones. Moreover, there exists an inverted U-shape relationship between migration-induced reduction of trade costs and σ since migration has an increasing impact on costs for homogeneos goods up to a threshold ($\sigma = 6.1$), and after that the effect quickly dimishes to zero.

The predictions of Chaney's model of cost-reducing effect of migrants' networks are also tested with data on Spanish provinces between 1993 and 2008 by Peri and Requena (2009). They find evidence that an increase in the stock of migrants by 10% increases the exports by 0.5-1% and effects are stronger for differentiated than homogeneous goods. Furthermore, the trade-creation effect is mainly due to the extensive margin of trade with little or no impact of migration on the intensive margin of trade.

Lewer (2006) focuses on the topic in a cross country framework: the relationship between bilateral migration and trade is analysed within OECD and the results confirm that bilateral trade is fostered by migration flows.

The cross-section sample of OECD countries for 2000 is considered also in Felbermayr and Toubal (2008). They undertake an attempt to separately quantify the reduction in trade costs and the creation of additional demand for goods from migrants' source countries. Results show that the total pro-trade effect of migration is driven mostly by the latter effect; however, the trade cost channel results stronger for differentiated goods and when high-skilled migrants are taken into account.

Finally, Morgenroth and O'Brien (2008) add to the existing evidence specifying a non-linearity between trade and migration and taking endogeneity of right-hand side variables into account. Their results support the complementarity between migration and trade flows, even if the negative sign on the squared migration variable shows that the marginal returns to immigration for trade diminish as immigrants' communities grow.

3 Data and evidence on migration and trade

Migration data are from the World Bank database recently released by Docquier and Marfouk (2004), which provides new estimates of workers' emigration stocks towards OECD countries for year 1990 and 2000. Sending countries include both developing and industrial countries (170 countries in 1990 and 190 countries in 2000). Being interested in the interaction between the South and the North of the world, we consider as reporters/destinations OECD countries[3], excluding the ones that may not be considered as advanced industrial countries: Czech Republic, Hungary, Mexico, Poland, Slovenia, Korea and Turkey. We keep them, together with all the other developing countries, as partners/origins.

As just said, this dataset unfortunately is limited to 1990 and 2000, therefore we merge it with data for 2005 from another database released by Ratha and Shaw (2007) for the World Bank[4]. The complete list of receiving and sending countries (reporters and partners, respectively) is available in Appendix A.

Data on trade flows are from the WITS-COMTRADE database[5]. Reporters are OECD countries and data concern bilateral imports and exports with 212 partners.

To explore the information channel we employ the SITC Rev. 2 and the SITC Rev. 3 data, respectively, for the construction of the aggregates of goods traded on organized exchanges (from now on, homogeneous goods), reference priced and differentiated products according to Rauch's classification[6] and the construction of the aggregates of high, medium and low elasticity of

[3]Belgium and Luxembourg are not included in our sample.

[4]They update and augment the bilateral migration matrix previously built by the Development Research Centre on Migration, University of Sussex, covering 212 countries, of which 24 are OECD countries, 34 are other high-income countries and 154 are low- and middle-income countries. Data are obtained by applying weights based on bilateral migrant stocks (from population censuses of individual countries) to the UN Population Division's estimates of total migrant stocks in 2005. Again we consider OECD industrialized countries as receiving countries and developing countries as sending countries.

[5]Many empirical works on international trade use the well known dataset collected by Feenstra et al. (2005). Since it does not include data regarding 2005, we opt for using alternative sources for trade data and mantaining the time dimension of our panel.

[6]Rauch (1999) actually asserts that the possession of a reference price is the distinguishing aspect of homogeneous goods, compared to differentiated ones. Then, homogeneous goods can be further divided into two categories according to their price quotation: goods whose prices are quoted on an organized exchange and goods whose prices are quoted only in trade publications. For the sake of simplicity, in the paper we will refer to those goods quoted on organized exchanges as homogeneous goods, while goods quoted in trade publications will be named as reference priced goods.

substitution according to Broda and Weinstein (2006).

To investigate the preferences channel, we use the aggregates of Food and Beverages (from now on primary goods) and Final Products (from now on final goods) from the BEC (Broad Economic Categories) classification which provides trade data re-classified by the "end-use" methodology and so, distinguishing primary and final goods for consumption from the rest of traded goods, useful information for this channel.

Finally, as far as the technology channel is concerned, we retrieved trade data in NACE 2 digit[7] in order to classify sectors as labour or capital intensive. As a matter of fact, we follow the method proposed by Romalis (2004) and we use the EU KLEMS database to calculate the average capital intensity in each NACE 2 digit sector for our reporters in the period 1990-2005. From this, we take the mean capital intensity for each sector across countries and classify as capital intensive those sectors above the mean value and as labour intensive the remaining ones (see Appendix C for a list of labour-capital intensive sectors)[8].

Before presenting the model to estimate, it is useful to analyse briefly the characteristics of our sample, with a specific focus on migration and trade data.

Considering OECD countries as a whole, the share of immigrants' stock from developing countries on total immigrants increases over time from 50.9% in 1990 to 61.3% in 2005 (see Table 1). In 2005, more than 60% of immigrants come from the South in most of the OECD countries considered here. In Japan this share is over 90%. The increasing trend is generalized with a few exceptions: Denmark, Italy, Portugal, United Kingdom and United States, where the share of migrants from developing countries decreases on average of 2 percentage points between 2000 and 2005.

To grasp the idea of the importance of migrants in labor markets it can be useful to analyse the stock of migrants in relation with the size of the overall labor force in destination countries[9].

In 10 out of 21 OECD countries (column 4, Table 1), the stock of immigrants from developing countries is large as more than 10% of the labor

[7]Actually, the original data classification was SITC rev. 3, however the WITS software allows for the immediate retrieval of the data in the NACE 2 digit classification.

[8]Unfortunately a finer disaggregation of NACE sectors was not possible due to the lack of data on the capital stock. Nevertheless we tried to use alternative definitions of capital intensity for the three digit sectors (such as compensation of capital over compensation of labour) and the two digit sector classification that emerged was more or less unchanged, so we preferred to stick on the capital-labour ratio that we consider the correct definition of capital intensity.

[9]Labor force data are from the World Development Indicators.

Table 1: Incidence of migrants from South on total migrants and labor force in OECD countries, and main region of origin

	Incidence of Southern migrants:				
	on total migrants (by year)			on total labor force	on total Southern migrants (by region of origin)
COUNTRY	1990	2000	2005		
Australia	35.0%	42.0%	44.3%	14.9%	ECA (33%)
Austria		72.8%	77.0%	18.3%	ECA (91%)
Canada	46.0%	60.3%	61.8%	16.3%	ECA (29%)
Denmark	56.5%	68.6%	65.7%	5.1%	ECA (38%)
Finland	33.4%	67.0%	63.9%	2.2%	ECA (66%)
France		56.7%	65.8%	12.0%	AFR (74%)
Germany	62.8%	65.2%	71.0%	10.4%	ECA (79%)
Greece	54.4%	61.8%	81.4%	6.5%	ECA (88%)
Iceland	17.3%	34.4%	38.4%	3.3%	ECA (66%)
Ireland		15.0%	19.4%	3.9%	ECA (35%)
Italy		82.4%	81.5%	5.4%	ECA (39%)
Japan	93.2%	93.9%	93.4%	1.9%	EAS (74%)
Netherlands		74.5%	77.2%	13.0%	ECA (38%)
New Zealand	29.7%	45.7%	45.6%	11.6%	OCE (32%)
Norway		53.0%	61.2%	6.3%	ECA (31%)
Portugal	93.5%	87.9%	71.2%	5.6%	AFR (76%)
Spain	39.6%	68.6%	69.4%	8.0%	SAM (47%)
Sweden		51.1%	61.9%	11.6%	ECA (44%)
Switzerland	31.8%	33.7%	41.7%	12.4%	ECA (65%)
UK		65.2%	63.0%	9.2%	SAS (35%)
USA		84.1%	82.5%	15.9%	CAM (56%)
Total	50.9%	58.1%	61.3%	9.0%	

ECA: Europe and Central Asia. CAM: Central America. SAM: South America. AFR: Africa. MEA: Middle East. EAS: East Asia. SAS: South Asia. OCE: Oceania.

force. Austria is the country where this percentage is the highest (18.3% on average) followed by Canada and United States. The share is lower in Japan (1.9%) and in Northern Europe.

Finally, as far as the region of origin is concerned, the last column shows that in 2005 people from Eastern Europe and Central Asia represent the bulk of migrants, not only for EU countries but also for Canada and Australia. It is interesting to note that past colonial ties play a crucial role in determining migration flows: Africa is the main origin for immigrants in France (74%), almost half of immigrants who live in Spain come from South America while one third of immigrants in UK is from South Asia.

From this quick descriptive analysis, we get hints that the South-North migration phenomenon has become larger and more relevant since 1990 and is destined to reconfirm as one of the main features of globalization together with the increase of North-South trade (OECD 2009).

To get some hints on countries' specialization we consider Northern overall normalized trade balance in Table 2.

Table 2: Normalized trade balance for OECD countries

Sectors/Years	1990	2000	2005
Rauch's classification:			
Differentiated Goods	0.47	0.41	0.48
Reference priced Goods	0.19	0.17	0.15
Homogeneous Goods	-0.36	-0.28	-0.27
Broda and Weinstein's classification:			
Low σ	0.34	0.34	0.40
Medium σ	0.15	0.13	0.21
High σ	0.21	0.17	0.21
Primary Goods	-0.10	-0.06	-0.02
Final Goods	0.17	0.13	0.17
Labour Intensive Goods	0.12	0.16	0.25
Capital Intensive Goods	0.18	0.21	0.27
Totals	0.16	0.15	0.21

OECD countries show positive trade balance for almost all good typologies with the exception of homogeneous goods, according to Rauch's classification, and primary goods, even if the latter declines over time.

4 The empirical model and estimation issues

The gravity equation emerged a long time ago as the most powerful tool to explain bilateral trade flows (Tinbergen, 1962; Linnemann, 1966; Anderson, 1979) and can be considered a suitable empirical model to test the relationship between trade and migration[10]. In empirical applications, the standard practice is to log-linearize the law of gravity for trade and to estimate the resulting equation with OLS. However, this practice presents two major drawbacks, as pointed out by Silva and Tenreyro (2006): it leads to biased estimates of the true elasticities in the presence of heteroskedasticity and, secondly, it compels the researcher to either exclude zero flows[11] from the estimates or force a non-linear transformation of the flows taking the log of $(1 + flow)$ to include zeros in the estimation[12]. In both respects, they propose a poisson pseudo-maximum-likelihood (PPML) estimation technique which, in several applications of log-linearisation under heteroskedasticity, may prove superior to OLS and support their view with Monte Carlo simulations and an empirical application to the gravity model[13]. Then we proceed estimating with the conditional fixed effects PPML estimator the following equation

$$f_{ijt} = \alpha + \beta Y_{ijt} + \gamma Migrants_{ijt} + \delta_i + \eta_j + \theta_{ij} + \tau_t + \epsilon_{ijt} \qquad (1)$$

where f_{ijt} represents the country i's import/export flow from/to country j at time t. Y_{ijt} is equal to $ln(GDP_{it}{}^{*}GDP_{jt})$ so it represents the economic size of the two countries in terms of nominal GDPs.

$Migrants_{ijt}$ is a measure of migrants from country j to country i, then γ is our parameter of interest. We use the logarithm of total migrants defined as $Migrants_{ij}$=ln(Total Stock of Migrants from j to i). The advantages of using a stock measure rather than the flow rely in the fact that the network theory refers to the presence of foreign born population to affect trade costs and preferences, but also we cannot forget that the stock contains in itself past migration and relaxes the stock exogeneity assumption of migration (Peri

[10]Gravity models have also been used to explain immigration per se; see for example Lewer and Van den Berg (2008).

[11]In fact, the number of zero observations in our case is negligible apart from when we consider capital and labour intensive goods, where they represent between 0.8% and 0.11% of the estimation sample.

[12]Helpman et al. (2008) develop a two stage procedure to account for selection into a trade relationship to account for zero flows. However their results show that most of the bias in empirical estimates is not due to selection but rather to the omission of the extensive margin of trade, which unfortunately we cannot take into account in our model.

[13]Tai (2009) further discusses the advantages of using such an estimator in the trade-migration gravity model.

and Requena, 2009; Tai, 2009). For the technology channel, however, the flow measure would be perhaps more suitable, nevertheless the exploitation of the time dimension by means of a fixed effects estimator helps in answering the question of how trade flows respond to the change in the presence of foreign born workers through time.

In the above equation, δ_i, η_j, θ_{ij} and τ_t respectively represent reporters', partners and pair time invariant unobservables, while τ_t refers to common time effects. Finally, ϵ_{ijt} is an idiosyncratic shock affecting trade flows.

The use of a conditional fixed effects PPML estimator then controls for any time invariant source of heterogeneity - multilateral resistance terms and bilateral time invariant specificities - that are likely to affect bilateral trade.

As a matter of fact, the theoretical grounding of the gravity equation[14] has been enriched by the contribution of Anderson and Van Wincoop (2003) who highlight the role of relative more than absolute trade costs in explaining bilateral trade in a CES expenditure system: apart from bilateral absolute trade costs, trade between countries i and j is explained by the resistance that the exporter faces in general on other markets and the resistance that the importer poses towards overall trade partners. Then, empirical specifications which omit the multilateral resistance terms bear biased estimates of any bilateral impediment to trade.

In the same direction, Baldwin and Taglioni (2006) extend the model in Anderson and Van Wincoop (2003) to allow for panel data and point out the most common mistakes of empirical studies on the gravity equation: to omit variables correlated with trade costs, to average imports and exports uncorrectly by taking the log of the averages instead of the average of the logs, to deflate nominal trade values inappropiately by means of aggregate price indexes.

We try to avoid them all keeping nominal flows (together with time dummies to control for international price changes), using exports and imports separately as dependent variables and controlling for reporter, partner and pair fixed effects by means of the estimation technique[15]. To proxy for the

[14]Anderson (1979) firstly theoretically founded the gravity equation in a model with CES preferences and goods differentiated by region of origin. More recently, some extensions preserve the CES structure and allow for the gravity equation to origin from models of monopolistic competition (Bergstrand, 1989) or from a Heckscher-Ohlin framework (Deardorff, 2001). Evenett and Keller (2002) in fact, find evidence for both factor proportions differences and increasing returns to scale as determinants of the extent of specialization and international trade flows. The complete specialization versions of both models however are not supported by the data.

[15]We are aware that the optimal solution would be the inclusion of time varying country dummies, however the little time variation of our panel does not allow us to include such a great amount of dummies. Nevertheless, we try to control for partner and reporter's time

deepening of globalization and account for the "shrinking of the globe" effect highlighted by Rauch (1999), we also include the time dummies and their interaction with bilateral distance. It is worth noting that the latter control represents a useful time-varying pair control to test the validity of the migration effect on trade since it is meant to allow for any other pair time varying feature likely to affect trade other than migration and the product of reporter and partner's GDP over the sample period.

The model also controls for the trade effect of the most important North-South Regional Trade Agreements: a dummy taking value 1 in 2000 and 2005 for partners in the EU enlargement process and in the North American Free Trade Agreement (NAFTA) and taking value 0 otherwise is added to the basic specification, thus allowing for a different level of bilateral trade when in a Noth-South RTA[16].

We also add the reporter's and the partner's logarithm of Real Exchange Rate[17] (Soloaga and Winters, 2001; Carrere, 2006) to the basic specification in equation 1 to control for further reporter and partner's time varying factors likely to affect bilateral trade. An increase/reduction in the real exchange rate represents a real appreciation/depreciation and then is expected to reduce a country's exports and increase the country's imports.

Finally, the likely endogeneity of migration could be thought to affect the consistency of the estimate of our parameter of interest[18], but the use of a fixed effects estimator allows us to test for the strict exogeneity of migration according to a test proposed by Wooldridge (2002)[19] from which - as shown

varying feature by means of the inclusion of real exchange rates (see below).

[16]Several empirical studies on the trade effect of RTAs (Soloaga and Winters, 2001; Carrere, 2006; Fratianni and Ho, 2007) suggest to capture trade diversion effects by means of a dummy taking value 1 when reporters/partners are in another RTA. In our sample, reporters are always part of a RTA different form the North-South one under analysis. As an example, the industrial European countries, besides their involvement in the enlargement process, are all members of the EU. The same goes for the United States and Canada which enjoy several agreements around the world. Then, if this is the case, the trade diversion dummy would always equal one for each reporter and would be collinear with the country fixed effect.

[17]The inclusion of the real exchange rates is thought to capture the degree of competitiveness of the trade partners.

[18]For this purpose, an instrumental variable estimator would be preferred. For cross-section data, Morgenroth and O'Brien (2008) use the fertility rate of the sending country which seem to prove helpful in their empirical setting. Building on their findings we proceeded analyzing a set of possible instruments as the ratio between reporters and partners' fertility rates, birth rates, life expectancy, unemployment rates, public spending in education and health; however, all of these instruments proved very weak, possibly leading to biased results.

[19]See page 285. However, the causal nexus from migration to trade has been recently

in detail in the following section - migration turns out to be strictly exogenous in almost all cases. Recently, Baier and Bergstrand (2007), analysing the effects of free trade agreements (FTAs) on trade flows, address the likely endogeneity of FTAs using instrumental variable techniques, control-function techniques and panel-data techniques; they demonstrate that, while the first two approaches do not account properly for endogeneity, a panel-data approach does.

Our estimation sample includes all the country pairs for which we have three observations, i.e. pairs that are present in 1990, 2000 and 2005 with no missing data. We then conduct a robustness check to see if results change once pairs for which we have just one or two observations across time are included in the sample.

Apart from trade and migration data already illustrated, we take countries' GDP from the World Bank Development Indicators database and the real exchange rates from the Penn World Table 6.2. The CEPII data set is used, instead, for the measure of bilateral distance (in kms) and the country pair dummy variables for common language, colonial status, etc. which we include in the specification when testing for random effects. Appendix B provides summary statistics for the variables of interest.

5 Results

This section present the results from the estimation of equation 1. As mentioned below each table, all specifications include time specific effects and their interactionwith distance, the RTA dummy and the real exchange rates of the partner and the reporter. A number of statistics and tests is reported: the P-values of the Hausman test for random effects[20], of the test for strict exogeneity for the migration variable and of the Wald test for the equality of coefficients on migration between the 1990-2000 sample and the whole sample. In any of the tables below the Hausman test rejects the random effects estimator, the Wald test confirms the validity of pooling the 2005 migration stock with the 1990-2000 sample and the test for strict exogeneity fails to reject the null on the hypothesis that future stocks predict exports and imports at time t.

Table 3 contains the results for total imports and exports and shows that

tested in several articles (Peri and Requena, 2009; Tai, 2009; Felbermayr and Jung, 2008).

[20]When estimating random effects model we also included a dummy for contiguity, common official and ethnic language, for colonial status of the partner with respect to the reporter and partner and reporter dummies to account for remoteness (Baldwin and Taglioni, 2006).

exports are positively and significantly affected by migration; the coefficient on imports is positive although non significant. The reporter and partner's real exchange rate are both significant and with the correct sign when exports are considered, while for imports only the reporter's real exchange rate is significant but with an unexpected sign. The same pattern of signs for real exchange rates is also found in the estimates below for some of the channels and this could hint at the fact that real exchange rates may also proxy for other factors different from competitiveness: real exchange rates contain information on countries' price levels and, as far as price levels are correlated with per capita incomes, a reduction in imports from less developed countries, as prices goes up at home, could reflect that these are inferior goods, and the occurrence that an increase in the partners' real exchange rates increases incomes also may reflect that, as countries become closer in terms of price and income levels, they exchange more. The identification of an effect from real exchange rates to trade is not our main interest, but we need to include them to control for any other reporter and partner's specific time varying factor which could affect their trade relations. Finally, the $R.T.A.$ dummy is positive and significant and its coefficient is very close to the one found by Silva and Tenreyro (2006) like the coefficient on the product of GDPs. Also the size of the estimated coefficient for migration is in line with previous panel and cross-section studies on the trade effect of migration (Head and Ries, 1998; Girma and Yu, 2002; Peri and Requena, 2009).

After this preliminary view on the overall effects of migration we move to explore the different channels.

5.1 Information

The first hypothesis that after Rauch (1999) has been widely explored by country-level studies (Rauch and Trinidade, 2002; Peri and Requena, 2009; Tai, 2009) concerns the relationship between the information cost reducing effect of migration and the market structure. Chaney (2008) shows that sectors where the elasticity of substitution is high are less affected by trade barriers, while the opposite happens for sectors where the elasticity is low. If it is true that search costs act as barriers to trade, then migration should have the greatest effect on matching international buyers and sellers of differentiated products or in general of products with a low elasticity of substitution.

To test this prediction in the upper panel of table 4 we present the results for the effects of migration on imports and exports respectively of differentiated, reference priced and homogeneous products according to Rauch's con-

Table 3: Total North-South Total Imports and Exports

	[1] Imports	[2] Exports
Y_{ij}	0.995***	0.909***
	[0.103]	[0.080]
$Migration_{ij}$	0.011	0.112***
	[0.052]	[0.043]
$ExchangeRatePartner$	0.011	0.049***
	[0.009]	[0.010]
$ExchangeRateReporter$	-0.023***	-0.025**
	[0.009]	[0.010]
$R.T.A.$	0.491***	0.376**
	[0.113]	[0.173]
Observations	5236	5442
Number of pair	1946	2008
Hausman Test	0.00	0.00
F-test of exogeneity	0.162	0.21
Wald Test	0.467	0.29

Legend: $^{*}p < .10;^{**}p < .05;^{***}p < .01$.
Robust standard errors in brackets.
All the specifications include logs of Partner's and Reporter's real exchange rates, RTA dummy, time dummies and their interaction with the log of distance (results are available upon the authors).
$Y_{ij} = ln(GDP_{it} {}^{*} GDP_{jt})$ and $Migrants_{ij}$ represents the log of the stock of migrants from country j to country i.

servative classification[21]. As expected, the effect of migration is positive and significant on the category of differentiated goods, and especially for exports, while it turns out to be non significant for the remaining two categories. This result is confirmed also in the lower panel of the table when, following Peri and Requena (2009), we use the Broda and Weinstein's classification of goods with low, medium and high elasticity of substitution.

As previously mentioned, our results strongly confirm the size of the estimated elasticities of trade to migration found in previous works. Also the fact that imports are less affected (both in terms of size and significance of the coefficient) echoes the finding by Peri and Requena (2009) on Spain, while it is somehow different from other studies which support the view of a stronger effect on imports due to the combination of information and preferences channels (Tai, 2009).

5.2 Preferences

Differently from previous studies, we believe that the use of total imports or of imports classified by the degree of substitutability are too general to address the issue of migrants' preferences, so we try to uncover the preferences channel extracting trade in primary and final goods from the BEC classification. Our belief is that using this "end-use" classification we can highlight those good categories which are most likely demanded by migrants far from their home countries. Also everyday experience suggests that migrants are particularly linked to their gastronomic culture and so it is very likely that the category of food and beverages, both primary and processed, could be affected by the demand of foreign born population. Apart from primary goods, migrants may also have different consumption habits for the way they dress, for the religion they practice and possibly even for the way they furnish their home; this is why we also select the category of final goods.

Table 5 shows that migration significantly affects the imports of primary and final goods from migrants' home countries. As expected, the preferences mechanism applies to imports and not to exports (Wagner et al., 2002). The estimated coefficient for imports of primary goods is twice as large than for imports of final goods, ranging close to the size of the one found by Rauch and Trinidade (2002) and Tai (2009).

[21] The results however do not change when using the liberal one.

Table 4: North-South Imports and Exports: Information Channel

RAUCH'S CLASSIFICATION						
	DIFFERENTIATED GOODS		REFERENCE PRICED GOODS		HOMOGENEOUS GOODS	
	Imports	Exports	Imports	Exports	Imports	Exports
Y_{ij}	1.255***	0.936***	0.696***	0.911***	0.262**	0.798***
	[0.098]	[0.084]	[0.078]	[0.097]	[0.104]	[0.189]
$Migration_{ij}$	0.119*	0.137***	0.000	0.007	-0.086	-0.019
	[0.069]	[0.047]	[0.054]	[0.037]	[0.058]	[0.096]
$ExchangeRatePartner$	0.043*	0.058***	0.022**	0.044***	0.014	-0.006
	[0.026]	[0.013]	[0.011]	[0.010]	[0.009]	[0.026]
$ExchangeRateReporter$	-0.031***	-0.022*	-0.027***	-0.034***	0.006	-0.017
	[0.012]	[0.011]	[0.007]	[0.009]	[0.011]	[0.021]
$R.T.A.$	0.329	0.358*	0.065	0.549***	0.370**	0.195
	[0.202]	[0.199]	[0.089]	[0.094]	[0.169]	[0.138]
Observations	5032	5392	4460	5009	3953	3810
Number of pair	1881	1992	1668	1866	1475	1424
Hausman Test	0.00	0.61	0.00	0.00	0.00	0.00
F-test of exogeneity	0.41	0.53	0.50	0.35	0.69	0.21
Wald Test	0.73	0.20	0.15	0.11	0.37	0.51
BRODA AND WEINSTEIN'S CLASSIFICATION						
	LOW σ		MEDIUM σ		HIGH σ	
	Imports	Exports	Imports	Exports	Imports	Exports
Y_{ij}	1.161***	0.953***	1.187***	0.762***	0.551***	0.965***
	[0.098]	[0.091]	[0.114]	[0.077]	[0.072]	[0.097]
$Migration_{ij}$	0.073	0.176***	0.092	0.062	-0.059	0.09
	[0.056]	[0.060]	[0.061]	[0.040]	[0.046]	[0.055]
$ExchangeRatePartner$	0.017	0.040***	0.033	0.060***	0.011	0.044***
	[0.016]	[0.010]	[0.022]	[0.013]	[0.007]	[0.012]
$ExchangeRateReporter$	-0.028**	-0.024**	-0.034***	-0.023**	-0.006	-0.031***
	[0.012]	[0.012]	[0.011]	[0.010]	[0.007]	[0.010]
$R.T.A.$	0.147	0.276	0.577***	0.451***	0.461***	0.464***
	[0.178]	[0.194]	[0.146]	[0.161]	[0.075]	[0.112]
Observations	4889	5330	4924	5308	4611	5207
Number of pair	1832	1972	1841	1969	1719	1936
Hausman Test	0.00	0.01	0.00	0.00	0.00	0.00
F-test of exogeneity	0.60	0.99	0.58	0.08	0.06	0.21
Wald Test	0.94	0.30	0.48	0.35	0.06	0.85

Legend: $^{*}p < .10;^{**}p < .05;^{***}p < .01$. Robust standard errors in brackets.
All the specifications include logs of Partner's and Reporter's real exchange rates, RTA dummy, time dummies and their interaction with the log of distance (results are available upon the authors).
$Y_{ij} = ln(GDP_{it} {}^{*} GDP_{jt})$ and $Migrants_{ij}$ represents the log of the stock of migrants from country j to country i.

Table 5: North-South Imports and Exports: Preferences Channel

	Primary Goods		Final Goods	
	Imports	Exports	Imports	Exports
Y_{ij}	0.774***	0.493**	1.249***	0.502***
	[0.090]	[0.212]	[0.181]	[0.121]
$Migration_{ij}$	0.131**	-0.019	0.287**	-0.066
	[0.060]	[0.053]	[0.145]	[0.052]
$ExchangeRatePartner$	0.048***	-0.047***	0.052	0.043
	[0.010]	[0.018]	[0.041]	[0.040]
$ExchangeRateReporter$	-0.044**	-0.029	-0.005	-0.052*
	[0.020]	[0.032]	[0.052]	[0.028]
R.T.A.	-0.022	0.36	0.246	0.505***
	[0.173]	[0.326]	[0.465]	[0.178]
Observations	2398	2492	2438	2679
Number of pair	921	943	935	1013
Hausman Test	0.00	0.00	0.00	0.00
F-test of exogeneity	0.92	0.73	0.33	0.01
Wald Test	0.91	0.69	0.67	0.33

Legend: $^{*}p < .10;^{**}p < .05;^{***}p < .01$. Robust standard errors in brackets.
All the specifications include logs of Partner's and Reporter's real exchange rates, RTA dummy, time dummies and their interaction with the log of distance (results are available upon the authors).
$Y_{ij} = ln(GDP_{it} {}^{*} GDP_{jt})$ and $Migrants_{ij}$ represents the log of the stock of migrants from country j to country i.

5.3 Technology

To test the effects of migration on the receiving and sending countries technology, we build two more aggregates of goods. As previously mentioned, following the work by Romalis (2004), we classify NACE sectors on the basis of the average capital/labour ratio across the reporters we have in our database and split the data into capital and labour intensive goods according to their capital-labour ratio being above or below the average value[22]. Then, if a traditional Heckscher-Ohlin view prevails one should expect that an increase in the stock of foreign workers reduces the differences in countries endowments making the North more labour abundant than before and the South more capital abundant. This process would result in a reduced specialization of the North in capital intensive goods and of the South in labour intensive goods. In absence of complete specialization, more than the reduction in Northern capital intensive exports and labour intensive imports from the South, one could expect that migration negatively/positively affects the North net exports of capital/labour intensive goods. This overall migration effect on trading partners specialization then could be retrieved from a reduction (increase) in exports (imports) of capital goods and possibly an increase (reduction) in exports (imports) of labour intensive goods. On the other hand, if the traditional theory is not at work, complementarity could prevail and migration could foster both imports and exports regardless.

Table 6 reports the results for the technology hypothesis and shows that when trade is split into labour and capital intensive goods, there is some weak evidence that the increasing presence of Southern migrants fosters the exports of labour intensive goods. On the other hand, the effect of migration on exports of capital intensive goods is negative but not significantly different from 0. Imports of both types of goods are not significantly affected by migration and the sign on the coefficients mimics the one for the exports. This result seems to echo the findings by Romalis (2004) who, combining the HO framework with scale economies and transport costs, finds that fac-

[22]We also exploited the remaining information from the BEC classification on the imports and exports of Industrial Supplies, Capital Goods and Transport Equipment to check whether complementarity or substitutability holds with respect to these goods categories. The findings are not really striking: the impact of migration is only significant on capital goods exports and imports thus suggesting a complementarity with capital goods in production, nevertheless for the category of transport equipment the sign is negative for exports and positive for imports, although not significant in both cases. One could think of different effects according to the cones of diversification (Davis, 1995) thus having a possible substitutability in technologies that are closer and complementarity in more advanced sectors, however from the BEC classification it is not possible to be aware of the overall capital intensity of these aggregates, so we decided to leave this set of results aside.

tor proportions appear to be an important determinant of the structure of international trade. In particular, he highlights a quasi-Rybczynski effect: countries that rapidly accumulate a factor see their production and export structures systematically move towards industries that intensively use that factor[23].

Table 6: North-South Imports and Exports: Technology Channel

	Labour intensive		Capital Intensive	
	Imports	Exports	Imports	Exports
Y_{ij}	1.468***	0.657***	0.416	0.444
	[0.091]	[0.102]	[0.472]	[0.274]
$Migration_{ij}$	0.078	0.113*	-0.002	-0.16
	[0.050]	[0.062]	[0.135]	[0.119]
$ExchangeRatePartner$	0.009	0.024	-0.022	
	[0.025]	[0.017]	[0.033]	[0.037]
$ExchangeRateReporter$	-0.060***	-0.003	0.047*	
	[0.013]	[0.011]	[0.026]	[0.026]
$R.T.A.$	0.169	0.104	-0.036	0.514*
	[0.208]	[0.228]	[0.350]	[0.264]
Observations	5111	5100	4715	4710
Number of pair	1867	1863	1715	1713
Hausman Test	0.00	0.00	0.00	0.00
F-test of exogeneity	0.52	0.86	0.47	0.44
Wald Test	0.60	0.75	0.81	0.12

Legend: $^{*}p < .10$;$^{**}p < .05$;$^{***}p < .01$. Robust standard errors in brackets.
All the specifications include logs of Partner's and Reporter's real exchange rates, RTA dummy, time dummies and their interaction with the log of distance (results are available upon the authors).
$Y_{ij} = ln(GDP_{it} * GDP_{jt})$ and $Migrants_{ij}$ represents the log of the stock of migrants from country j to country i.

5.3.1 Further checks

To test the validity of the previous findings we conducted some checks for robustness. The first check has been to control for sample selection bias: taking the log of the migrant stocks ends in creating missing values for those

[23]In a totally different framework, Lewis (2005) analyses the relationship between the use of automation technologies and immigration in U.S. metropolitan areas and finds that the latter has a negative causal impact on the former. This means that an increase in the supply of low-skilled workers induces firms to downgrade the technology they are using in the production process, although change in the national industry composition is not supported by empirical evidence. On the other hand, Peri (2009) shows that the impact of immigration is positive on total factor productivity, while capital intensity and the skill-bias of production technologies diminish as the number of immigrant workers increases.

country pairs showing 0 in certain years. Therefore we estimated a probit model for the probability to observe a non zero migration stock[24], we calculated the inverse Mill's ratio and added it as a further regressor in the estimating equation. The previous findings stay exactly unchanged as shown in table 7-10 in the Appendix D.

We also checked whether a particular sample composition could drive our results. First, we excluded the OPEC countries[25] from the sample; secondly, we restricted the definition of South to those countries displaying a GDP per capita (at constant international dollars) below the average of the minimum GDP per capita of reporters[26]. Finally, we further restricted the definition of Southern countries excluding all those classified as high income countries by the World Bank[27]: the above results have proved robust to all the changes in the composition of our sample. All these further results are not shown for the sake of brevity, although available from the authors upon request.

6 Conclusions

This paper has addressed the empirical question on the relationship between trade and migration in a thorough North-South cross country framework, where initial differences in factor endowments, technology and cultural habits could let South-North migration help the shaping of trade specialization and preferences in the receiving country and the reduction of bilateral information costs.

Our main contribution is the dissecting of the effects across different goods typologies. With respect to the recent evidence on the network effects of migration, our work is the first to provide cross country evidence over time

[24]Apart the variables in the gravity equation, as explanatory variables we included a complete set of dummies for contiguity, common official and common ethnic language, for former and current colonial relations, for having been part of the same country, the log of population and continent dummies for receiving and sending countries and common time effects.

[25]The oil exporters are the United Arab Emirates, Bahrain, Brunei, Oman, Qatar, Saudi Arabia, Iran, Iraq, Venezuela, Ecuador, Angola, Algeria, Kuwait, Libya, and Nigeria.

[26]This led to the exclusion of the United Arab Emirates, Bahrain, Bahamas, Cyprus, the Czech Republic, Estonia, Hong Kong, Hungary, Israel, Korea, Kuwait, Macao, Malta, Oman, Saudi Arabia, Singapore, Slovak Republic and Slovenia from the estimation sample.

[27]This led to the exclusion of Andorra, Antigua and Barbuda, Aruba, Bahamas, Bahrain, Barbados, Bermuda, Brunei, Cayman Islands, Croatia, Cyprus, Equatorial Guinea, Estonia, Faroe Islands, French Polynesia, Greenland, Guam, Hong Kong, Israel, Kuwait, Macao, Malta, Netherlands Antilles, New Caledonia, Northern Mariana Islands, Oman, Qatar, Saudi Arabia, Singapore, Slovenia, Trinidad and Tobago, United Arab Emirates and the Virgin Islands (U.S.).

(1990-2005) of a different effect according to the sector market structure. Since differentiated-low elasticity of substitution sectors are shown to be the most affected by trade barriers (Chaney, 2008), they are also the ones that can benefit more from the reduction of search costs associated with matching potential trading partners thanks to the presence of immigrants. Our results show that bilateral trade in differentiated goods is positively influenced by the stock of Southern immigrants in developed countries and the magnitude of this effect is bigger for exports than for imports. This effects on exports in particular holds both with Rauch's classification of goods (1999) and with the classification based on Broda and Weinstein (2006).

As far as the preferences channel is concerned, we add to the existing evidence testing the effect of migration on the demand of primary and final products according to the BEC "end-use" classification. Imports of both primary and final goods increase as the stock of foreign born people increases while exports are predictably not affected. Immigrants' desire for home country goods is due to the fact that it is presumably difficult for them to find close substitutes in host countries and their demand is hence satisfied through imports.

We then split trade into labour and capital intensive goods to explore the technology channel. Our attempt is based on a classification of the NACE sectors according to their capital/labour ratio, and the evidence goes somehow in favour of the predictions from the Heckscher-Ohlin model. Indeed, the increasing presence of immigrants seem to foster the exports of labour intensive goods while exports of capital intensive goods are negatively (although not significantly) affected by migration.

The analysis clearly shows that, to disentagle and better understand the different ways in which international labour flows may affect trade, distinctions between different types of goods need to be necessarily taken into account. The increased availability of migration data might then lead to further developments of the present piece of research to better identify the causal link between trade and migration over time.

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Appendix A: Sample of countries

REPORTERS	PARTNERS		
AUS	AGO	GNQ	PAN
AUT	ALB	GTM	PER
CAN	ARE	GUY	PHL
CHE	ARG	HKG	PNG
DNK	ARM	HND	POL
ESP	AZE	HRV	PRY
FIN	BDI	HTI	QAT
FRA	BEN	HUN	ROM
GBR	BFA	IDN	RUS
GER	BGD	IND	RWA
GRC	BGR	IRN	SAU
IRL	BHR	ISR	SDN
ISL	BHS	JAM	SEN
ITA	BIH	JOR	SGP
JPN	BLR	KAZ	SLB
NLD	BLZ	KEN	SLE
NOR	BOL	KGZ	SLV
NZL	BRA	KHM	SOM
PRT	BRB	KOR	STP
SWE	BRN	KWT	SUR
USA	BTN	LAO	SVK
	BWA	LBN	SVN
	CAF	LBR	SWZ
	CHL	LBY	SYR
	CHN	LCA	TCD
	CIV	LKA	TGO
	CMR	LSO	THA
	COG	LTU	TJK
	COL	LVA	TKM
	COM	MAC	TON
	CPV	MAR	TTO
	CRI	MDA	TUN
	CYP	MDG	TUR
	CZE	MDV	TZA
	DJI	MEX	UGA
	DOM	MKD	UKR
	DZA	MLI	URY
	ECU	MLT	UZB
	EGY	MNG	VCT
	ERI	MOZ	VEN
	EST	MRT	VNM
	ETH	MUS	VUT
	FJI	MWI	WSM
	FSM	MYS	YEM
	GAB	NER	YUG
	GEO	NGA	ZAF
	GHA	NIC	ZAR
	GIN	NPL	ZMB
	GMB	OMN	ZWE
	GNB	PAK	

Appendix B: Summary Statistics

Variable	Mean	Std. Dev.	Min	Max	Observations
Imports of:					
Differentiated Goods	687417.8	5132824	0.00	2.14E+08	10241
Reference Priced Goods	209443.5	1137742	0.00	4.42E+07	8933
Homogeneous Goods	193864.9	1146549	0.00	3.86E+07	7816
Low Sigma	351421.2	2267024	0.00	1.07E+08	10425
Medium Sigma	448179.3	3144883	0.00	1.31E+08	10555
High Sigma	376813.2	2152461	0.00	9.75E+07	9843
Primary Goods	36109.09	224948.7	0.00	9456867	6890
Final Goods	118681.9	1692888	0.00	1.12E+08	7510
Labour Intensive Goods	157760.1	1305298	0.00	8.97E+07	11188
Capital Intensive Goods	93983.35	1085607	0.00	5.72E+07	11188
Industrial Supplies	109444.4	762441.5	0.00	3.44E+07	7500
Capital Goods	136905.3	1722131	0.00	9.76E+07	6787
Transport Equipment	58452.62	782398.8	0.00	3.90E+07	4916
Total Imports	1064345	6956634	0.01	2.62E+08	10617
Exports of:					
Differentiated Goods	616625.5	4190729	0.00	1.41E+08	10841
Reference Priced Goods	168265.3	1057787	0.00	4.52E+07	9931
Homogeneous Goods	88353.14	743102.4	0.00	3.91E+07	7532
Low Sigma	315613.5	1791549	0.00	5.19E+07	11341
Medium Sigma	376129	2761873	0.00	1.34E+08	11356
High Sigma	265637.5	1819442	0.00	9.86E+07	11067
Primary Goods	20159.81	125174.1	0.01	7.01E+06	7405
Final Goods	30800.36	186254.5	0.01	9924729	8238
Labour Intensive Goods	123800.1	792524.5	0.00	2.94E+07	11188
Capital Intensive Goods	80846.4	730788.7	0.00	4.02E+07	11188
Industrial Supplies	100893	825672.2	0.01	3.93E+07	8661
Capital Goods	125950.5	1048728	0.07	4.04E+07	8735
Transport Equipment	59052.58	401961.1	0.00	1.77E+07	7498
Total Exports	910467	6102224	0.00	2.66E+08	10967
$Migration_{ij}$	6.40	2.87	-0.98	16.15	9118
Y_{ij}	49.87	2.80	41.44	59.29	11071
Exchange Rate Partner	3.13	3.29	-19.85	14.17	11218
Exchange Rate Reporter	2.17	2.63	-1.22	14.17	11624
R.T.A.	0.04	0.18	0.00	1	11979

Appendix C: Classification of capital/labour intensive goods based on NACE Rev 1.1 2 digit sectors

CAPITAL INTENSIVE GOODS	LABOUR INTENSIVE GOODS
Chemicals, chemical products and man-made fibres	Food products and beverages
Basic metals and fabricated metal products	Textiles and textile products
Fabricated metal products, except machinery and equip.	Wearing apparel; dressing and dyeing of fur
Transport equip.	Leather and leather products
Other transport equip.	Wood and wood products
Manufacturing n.e.c.	Pulp, paper and paper products; publishing and printing
	Publishing, printing and reproduction of recorded media
	Rubber and plastic products
	Other non-metallic mineral products
	Machinery and equip. n.e.c.
	Electrical and optical equip.
	Electrical and optical equip.
	Radio, television and communication equip. and apparatus
	Medical, precision and optical instruments, watches and clocks

Appendix D: Robustness checks. Estimates with first-stage inverse Mill's ratio.

Table 7: Total North-South Total Imports and Exports

	[1] Imports	[2] Exports
Y_{ij}	0.979***	0.905***
	[0.098]	[0.077]
$Migration_{ij}$	0.023	0.117***
	[0.050]	[0.043]
$ExchangeRatePartner$	0.010	0.048***
	[0.009]	[0.010]
$ExchangeRateReporter$	-0.026***	-0.027**
	[0.009]	[0.011]
R.T.A.	0.456***	0.361**
	[0.119]	[0.177]
Observations	5090	5271
Number of pair	1888	1942
Hausman Test	0.00	0.00
F-test of exogeneity	0.42	0.12
Wald Test	0.54	0.28

Legend: $^{*}p < .10;^{**}p < .05;^{***}p < .01$.
Robust standard errors in brackets.
All the specifications include logs of Partner's and Reporter's real exchange rates, RTA dummy, time dummies and their interaction with the log of distance, the inverse Mill's ratio from the first-stage probit estimation (results are available upon the authors).
$Y_{ij} = ln(GDP_{it} {}^{*} GDP_{jt})$ and $Migrants_{ij}$ represents the log of the stock of migrants from country j to country i.

Table 8: North-South Imports and Exports: Information Channel

RAUCH'S CLASSIFICATION						
	DIFFERENTIATED GOODS		REFERENCE PRICED GOODS		HOMOGENEOUS GOODS	
	Imports	Exports	Imports	Exports	Imports	Exports
Y_{ij}	1.266***	0.933***	0.667***	0.882***	0.237**	0.796***
	[0.101]	[0.081]	[0.070]	[0.090]	[0.104]	[0.188]
$Migration_{ij}$	0.112*	0.143***	0.030	0.028	-0.087	-0.034
	[0.064]	[0.048]	[0.045]	[0.037]	[0.057]	[0.099]
$ExchangeRatePartner$	0.044*	0.057***	0.018*	0.041***	0.015*	-0.007
	[0.026]	[0.013]	[0.010]	[0.010]	[0.008]	[0.026]
$ExchangeRateReporter$	-0.030***	-0.024**	-0.037***	-0.036***	-0.004	-0.017
	[0.011]	[0.012]	[0.007]	[0.008]	[0.012]	[0.021]
$R.T.A.$	0.338	0.339*	-0.001	0.492***	0.330**	0.210
	[0.208]	[0.202]	[0.094]	[0.105]	[0.157]	[0.144]
Observations	4903	5227	4355	4864	3909	3714
Number of pair	1828	1927	1627	1809	1457	1387
Hausman Test	0.00	0.00	0.00	0.00	0.00	0.00
F-test of exogeneity	0.36	0.55	0.06	0.18	0.72	0.15
Wald Test	0.76	0.19	0.27	0.19	0.46	0.62
BRODA AND WEINSTEIN'S CLASSIFICATION						
	LOW σ		MEDIUM σ		HIGH σ	
	Imports	Exports	Imports	Exports	Imports	Exports
Y_{ij}	1.145***	0.945***	1.170***	0.770***	0.538***	0.959***
	[0.097]	[0.086]	[0.108]	[0.076]	[0.070]	[0.093]
$Migration_{ij}$	0.089*	0.183***	0.110*	0.061	-0.048	0.098*
	[0.052]	[0.060]	[0.057]	[0.042]	[0.045]	[0.058]
$ExchangeRatePartner$	0.014	0.039***	0.031	0.060***	0.011*	0.044***
	[0.016]	[0.010]	[0.023]	[0.013]	[0.006]	[0.012]
$ExchangeRateReporter$	-0.029**	-0.027**	-0.035***	-0.022**	-0.012	-0.032***
	[0.012]	[0.012]	[0.011]	[0.010]	[0.008]	[0.010]
$R.T.A.$	0.091	0.251	0.540***	0.462***	0.435***	0.446***
	[0.183]	[0.199]	[0.153]	[0.157]	[0.069]	[0.118]
Observations	4760	5167	4808	5147	4507	5046
Number of pair	1779	1908	1794	1907	1678	1873
Hausman Test	0.00	0.00	0.00	0.42	0.00	0.00
F-test of exogeneity	0.14	0.93	0.27	0.09	0.09	0.19
Wald Test	0.89	0.27	0.54	0.45	0.09	0.83

Legend: $^{*}p < .10;^{**}p < .05;^{***}p < .01$. Robust standard errors in brackets.
All the specifications include logs of Partner's and Reporter's real exchange rates, RTA dummy, time dummies and their interaction with the log of distance, the inverse Mill's ratio from the first-stage probit estimation (results are available upon the authors).
$Y_{ij} = ln(GDP_{it} {}^{*} GDP_{jt})$ and $Migrants_{ij}$ represents the log of the stock of migrants from country j to country i.

Table 9: North-South Imports and Exports: Preferences Channel

	Primary Goods		Final Goods	
	Imports	Exports	Imports	Exports
Y_{ij}	0.738***	0.479**	1.333***	0.465***
	[0.093]	[0.213]	[0.199]	[0.122]
$Migration_{ij}$	0.147**	-0.003	0.276**	-0.083
	[0.066]	[0.055]	[0.131]	[0.056]
$ExchangeRatePartner$	0.039***	-0.046**	0.063	0.023
	[0.010]	[0.018]	[0.041]	[0.035]
$ExchangeRateReporter$	-0.070***	-0.052	0.032	-0.094***
	[0.021]	[0.034]	[0.058]	[0.027]
$R.T.A.$	-0.068	0.271	0.335	0.424**
	[0.178]	[0.336]	[0.473]	[0.203]
Observations	2354	2419	2402	2614
Number of pair	902	914	919	987
Hausman Test	0.00	0.00	0.00	0.00
F-test of exogeneity	0.55	0.31	0.90	0.29
Wald Test	0.89	0.62	0.46	0.09

Legend: $^{*}p < .10$;$^{**}p < .05$;$^{***}p < .01$. Robust standard errors in brackets.
All the specifications include logs of Partner's and Reporter's real exchange rates, RTA dummy, time dummies and their interaction with the log of distance, the inverse Mill's ratio from the first-stage probit estimation (results are available upon the authors).
$Y_{ij} = ln(GDP_{it} {}^{*} GDP_{jt})$ and $Migrants_{ij}$ represents the log of the stock of migrants from country j to country i.

Table 10: North-South Imports and Exports: Technology Channel

	Labour intensive		Capital Intensive	
	Imports	Exports	Imports	Exports
Y_{ij}	1.477***	0.661***	0.416	0.444
	[0.104]	[0.104]	[0.472]	[0.274]
$Migration_{ij}$	0.073	0.123*	-0.002	-0.16
	[0.053]	[0.067]	[0.135]	[0.119]
$ExchangeRatePartner$	0.009	0.024	-0.022	0.025
	[0.027]	[0.017]	[0.033]	[0.037]
$ExchangeRateReporter$	-0.059***	-0.003	0.047*	-0.026
	[0.014]	[0.010]	[0.026]	[0.026]
$R.T.A.$	0.176	0.098	-0.036	0.514*
	[0.174]	[0.224]	[0.350]	[0.264]
Observations	4958	4947	4715	4710
Number of pair	1810	1806	1715	1713
Hausman Test	0.00	0.00	0.00	0.00
F-test of exogeneity	0.53	0.74	0.47	0.44
Wald Test	0.81	0.80	0.81	0.12

Legend: $^{*}p < .10;^{**}p < .05;^{***}p < .01$. Robust standard errors in brackets.
All the specifications include logs of Partner's and Reporter's real exchange rates, RTA dummy, time dummies and their interaction with the log of distance, the inverse Mill's ratio from the first-stage probit estimation (results are available upon the authors).
$Y_{ij} = ln(GDP_{it} {}^{*} GDP_{jt})$ and $Migrants_{ij}$ represents the log of the stock of migrants from country j to country i.