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RESUMEN
Este trabajo argumenta y ofrece evidencia empírica sobre el efecto positivo del stock de inmigrantes en un país sobre su comercio intra-industrial (CII) bilateral con los países de origen de los inmigrantes. El trabajo relaciona la literatura sobre inmigración y comercio y la literatura sobre los determinantes del CII. La inmigración contribuye a la reducción de los costes de comercio y dicha reducción beneficia más a los intercambios intra-industriales que a los inter-industriales. Contrastamos esta hipótesis utilizando datos de la economía española y tomando como marco teórico el trabajo de Helpman (1987). La inmigración tiene un mayor efecto positivo sobre el CII en manufacturas y entre España y los países menos desarrollados. Los resultados son robustos a diferentes especificaciones y métodos de estimación.

Palabras clave: Comercio intra-industrial, inmigración.

JEL classificación: 32, F31, F33.

ABSTRACT
This paper argues and provides evidence that the stock of immigrants in a country have a positive effect on the share of its bilateral intra-industry trade (IIT). The paper links the literatures about immigration and trade and about IIT determinants. The key is that immigration contributes to trade transaction costs reduction and this would benefit more intra than inter-industry trade. We test this hypothesis using Spanish data and departing from the models developed by Helpman (1987). Immigration helps more IIT in manufactures and IIT between Spain and less developed countries. Results are robust both to different estimation methods and specifications.

Keywords: Intra-industry trade, immigration.

JEL classification: 32, F31, F33.

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I. Introduction

The increase in immigrant flows and in immigrant population is one of the most challenging political and sociological issues for EU countries. Immigration has also important economic consequences. Although most economic studies have focused on the effects of immigration on host-country labour markets and its welfare state, literature has recently begun to focus on another relevant aspect of immigration: the link between immigrant population and host-country trade. This paper is an attempt to increase the - still scarce - empirical evidence about this subject by analysing a new subject: the effect of immigration on intra-industry trade.

This paper argues and provides evidence that the stock of immigrants in a country have a positive effect on the share of intra-industry trade in total bilateral trade between this country and immigrants home country. The paper links the recent literature of immigration and trade and the literature about the determinants of intra-industry trade. The first suggests that immigration helps trade by reducing trade transaction costs and this would benefit more trade in differentiated than in homogeneous products. The second states that intra-industry trade occurs mainly in differentiated goods and that trade cost reduction would benefit more intra than inter-industry trade. Hence, immigration would increase the share of intra-industry trade in total trade since it contributes more to the increase of intra than inter-industry trade. We test this hypothesis using Spanish data and departing from the theoretical and empirical models developed by Helpman (1987) enhanced according to Hummels and Levinshon (1995)

and adding a variable which measures the stock of immigrants in Spain by partner country. Results are robust both to the different estimation methods commonly used in the literature on intra-industry trade determinants and to different specifications. Estimation for different groups of countries and for different types of products also confirms the robustness of our results.

The structure of the paper is as follows. The next section presents, first, the reasons to argue that immigration could increase intra-industry trade more than inter-industry trade and, second, the extent and geographical distribution of immigration in Spain. Section III presents the empirical model. Section IV presents the econometric results. Finally, Section V offers some concluding remarks.

II. How can immigration increases intra-industry trade share in total trade?

In this section we present theoretical and empirical reasons to argue that immigration has a positive effect on the share of intra-industry trade in total bilateral trade. We do that by linking the recent literature about the positive effect of immigration on bilateral trade and the literature about intra-industry trade determinants.

In one hand, there is a recent growing literature arguing that immigrants can have a positive effect on bilateral trade between immigrant's host and home countries. Immigration can influence trade flows through two basic channels: immigrants bring with them a preference for home-country products and, what is more relevant for the aim of this paper, immigration can reduce trading transaction costs. This second channel is twofold. First, immigration can create (ethnic) networks - knowledge of home-

with their countrymen who remain at the home country due to issues of trust or of mutually understood culture[1]. Second, cultural ties, as common languages, historical colonial ties, common preferences, knowledge of political and social institutions, can reduce trading transaction costs. Immigrants can contribute to increase mutual knowledge between both home and host countries and about goods available in each country and its characteristics.

The existing literature suggests that the relevance of this trade transaction costs reduction would be different for different types of products. More precisely, Rauch (1999) shows that this effect will be greater for differentiated products than for products traded on organized exchanges - usually homogeneous products. Moreover, according to Gould (1994), the additional information brought by immigrants can be more relevant for consumer goods than for producer goods, since the first tend to be more differentiated products across countries. Finally, Dunlevy and Hutchinson (1999) argue that trade of consumer goods and processed foodstuffs would have stronger immigrant effects than crude or semi-manufactured goods, to the extent that they are imported to satisfy specific tastes. So, according to this literature, the effect of immigration on trade will be greater for differentiated products, since transaction costs (as the ones to get information about products / varieties characteristics) are more relevant for differentiated than for homogeneous products.

[1] The relevance of networks in reducing trade transaction costs and the positive role than immigrants can play in creating these networks has been formalized by Rauch (1999) and surveying by Rauch (2001).

In the other hand, as most theoretical papers show[2], intra-industry trade occurs mainly in differentiated products[3]. Trade transaction costs have been usually included in empirical tests as a negative determinant of the share of intra-industry trade in total trade. The argument goes as follows. If the elasticity of substitution between varieties of a differentiated product is greater than the elasticity of substitution between homogeneous goods, a decline in trade transaction costs will have a large (positive) effect on the volume of intra-industry trade than it does on the volume of inter-industry trade. Trade transaction costs have been proxied in different ways. For example using the geographical distance between countries, which, apart from increase transport costs, increases the costs of getting information about product characteristics. Another proxy widely used is to include a dummy variable for economic integration process membership, since this reduces not only tariffs but also non-tariff barriers to trade[4].

In this paper we argue that the stock of immigrants in a country can also (negatively) proxy trade transaction costs and, so, have a positive effect on bilateral intra-industry trade. Since trade transaction costs affect more intra than inter-industry trade, immigrant's stocks in a country can contribute to increase the volume of bilateral intra-industry trade between immigrant's host and home countries more than the volume of inter-industry trade, increasing, hence, the share of the former in total trade. This effect would be additional to the ones from other variables that also can proxy trade transaction costs. This paper test for the existence of such a positive effect departing from the work of Helpman (1987) about intra-industry trade determinants modified

[2] Helpman and Krugman (1985) summarize the literature about monopolistic competition and (horizontal) intra-industry trade and Falvey and Kierzkowsky (1987) and Flam and Helpman (1987) develop models of intra-industry trade in goods vertically differentiated.
[3] Main exceptions being Davis (1995) and models of reciprocal dumping, as Brander and Krugman (1983).
[4] See Greenaway and Hine (1991) for a nice explanation of the role of economic integration on intra-industry trade relevance.

according to the paper of Hummels and Levinshon (1995) and adding a variable that measures the stock of immigrants living in a country.

Two additional questions arise when analysing the effect of immigration on intra-industry trade. First, as long as intra-industry trade is a higher share of total trade for manufactured goods than for other types of goods and the literature argues that immigrants will increase more trade in manufactured products, we estimate separate regressions for manufactured and non-manufactured goods. Second, usually, intra-industry trade is considered as a North-to-North matter - most intra-industry trade occurs between developed countries - while immigration seems to be a South to North flow. We take into account this point by exploring if immigrants have a different effect on intra-industry trade depending from their geographical - South or North - origin.

Looking at the volume and geographical distribution of immigration data for the Spanish economy (Table 1), it seems to be a suitable case study for analyse those questions. Spain, until recently a source of migrants, has become a relevant destination of migrants. Immigrants represent about 2.5% of total population in Spain in 2000 (about a million people) when it was less than a 1% only ten years before. Although the number of immigrants from developing countries has grown faster than the average, immigration is still evenly distributed by North and South countries of origin and Spain hosts a relevant number of immigrants both from developed and developing countries. Hence, we decided to use data from Spain and 42 partner countries (its main source of immigrants) for the period 1991 to 1998.

III. An empirical model of intra-industry trade with immigration

Our dependent variable is the share of intra-industry trade (IIT) in total bilateral trade. We measure it at the 5-digit level of the SITC classification (*j*), using the Grubel and Lloyd index, adjusted for categorical aggregation (Greenaway and Milner, 1983).

$$IIT_i = \frac{\sum_{j=1}^{J}\left(X_{ij} + M_{ij}\right) - \sum_{j=1}^{J}\left|X_{ij} - M_{ij}\right|}{\sum_{j=1}^{J}\left(X_{ij} + M_{ij}\right)} \times 100 \qquad (1)$$

where X / M are bilateral exports / imports of Spain with partner i.

Although the purpose of this paper is not to explain the determinants of IIT but to test for the effect of immigration on such trade, the empirical model takes into account the theory about IIT. In fact, as pointed out by Hummels and Levinshon (1995), the weak relationship between the empirical tests of the determinants of IIT and the theory is, maybe, the main shortcoming of this type of analysis. So, following those authors, we depart from the work of Helpman (1987) as for the theoretical framework for explaining intra-industry trade. Helpman (1987) developed some simple models of monopolistic competition and trade and tested some hypotheses that were directly motivated by the theory. Following Hummels and Levinshon (1995), we use direct measures for factor endowment differences instead of income per capita and add to the empirical specification a variable measuring the geographical distance between countries. Because we use as the reference country Spain, we also include in the model a dummy variable for those partner countries that are members of the European Union (EU). Finally, to this basic model, we add a variable that measures the number of immigrant population in Spain by country of origin.

So our empirical model is:

$$IIT_{it} = \alpha_0 + \alpha_1 kldif_{it} + \alpha_2 \min gdp_{it} + \alpha_3 \max gdp_{it} + \alpha_4 dist_i + \\ + \alpha_5 eu_{it} + \alpha_6 imm_{it} + \mu_{it} \quad (2)$$

Where:

IIT_{it} is the index of intra-industry trade between Spain and partner country i in year t.

$kldif_{it}$ measures relative factor composition as the logarithm of the difference in the ratio stock of capital / working population between Spain and partner country i in year t

$$\log\left|\frac{K_t^{Spain}}{L_t^{Spain}} - \frac{K_t^i}{L_t^i}\right| \quad (3)$$

$mingdp_{it}$ ($maxgdp_{it}$) is the minimum (maximum) of the logarithm of the GDPs of Spain and partner country i in year t

$$\min(\log GDP_t^{Spain}, \log GDP_t^i) \quad (4)$$

$$\max(\log GDP_t^{Spain}, \log GDP_t^i) \quad (5)$$

and both control for relative size effects.

$dist_i$ is the logarithm of the geographical distance between Spain and partner country i

eu_{it} is a dummy variable taking the value 1 for those countries which are members of the European Union in year t and 0 if they are not[5], and

[5] The *eu* variable has a *t* subscript because some countries in our sample joint the EU in 1995.

imm_{it} is the logarithm of the stock of immigrants in Spain from partner country *i* in year *t*.

Trade data comes from Eurostat Comext database. *K*, *L* and *GDP* come from The Penn World Tables 6 - see Hummels and Levinshon (1995) to an explanation about how *K* and *L* are computed. *dist* comes from PCGLOBE and the stock of immigrants in Spain from the Instituto Nacional de Estadística (INE), Spain.

According to Helpman (1987) and Hummels and Levinshon (1995), the model predicts α_1, α_3 and α_4 to be negative and α_2 to be positive. We expect α_5 and α_6 to be positive for the reasons already exposed[6].

However, we remain sceptics about the expected negative sign for the differences in factor endowments parameter. Although the hypothesis of Helpman (1987) is correct in a model of monopolistic competition, which generates horizontal intra-industry trade, it is not in models that explain vertical intra-industry trade, as Falvey and Kierzkowsky (1987). They stated that IIT could be positively related with differences in factor endowments when goods are vertically differentiated[7]. Moreover, recent empirical work on the nature of IIT has provided evidence that for most countries trade in vertically differentiated products is not only significant but also higher and

[6] See Helpman (1987) and Hummels and Levinshon (1995) for the economic justification to the expected signs for α_1 to α_4 parameters.
[7] Greenaway et al. (1994) were the first to show, disentangling total IIT in vertical and horizontal IIT in UK trade, that vertical IIT increases with differences in factor endowments. For the case of Spain, we can find the first evidence in Blanes and Martín (2000).

more dynamic than trade in horizontally differentiated products[8]. As in our model we are estimating for total IIT it is not possible to be sure about the sign of the effect of factor endowments differences on total IIT. In any case and according to the previous literature we can expect also a positive sign for this parameter, as most Spanish IIT is vertical IIT. So, to identify the sign of the effect of factor endowments differences on IIT we should disentangling IIT in both horizontal and vertical IIT and estimate separately. However, as long as there are not reasons to expect a different qualitative effect of immigration on horizontal or vertical intra-industry trade, neither the other included variables, we believe that it is beyond the scope of this paper to compute horizontal and vertical intra-industry trade indexes and to estimate separate specifications for each type of intra-industry trade.

Because *IIT* is an index varying between 0 and 1, OLS cannot be directly used to estimate the model (estimated coefficients would be not efficient). Two solutions are usually offered by the existing literature[9]. One, to apply a logistic transformation to *IIT* and then use OLS to estimate the model:

$$\log\left(\frac{IIT_{it}}{1-IIT_{it}}\right) = \beta' X_{it} + \mu_{it} \qquad (6)$$

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

Although the logit transformation has the advantage of ensuring that predicted values are within the range 0 to 1, it has the disadvantage of excluding all observations

[8] See Brülhart and Hine (1999) for most EU countries (Spain is not included) and, apart from Blanes and Martín (2000), Martín-Montaner and Orts (2002) or Díaz (2002) for Spain.
[9] See for a discussion Balassa (1986).

where the index of IIT takes values 0 or 1. This is why some authors have made use of a logistic function estimated by Non-Linear Lest Squares (NLLS):

$$IIT_{it} = \frac{1}{1+\exp(-\beta' X_{it})} + \mu_{it} \tag{7}$$

We apply both of them, which allows us to test for the robustness of our results. Finally, another possibility would be to try to take advantage of the panel data nature of the data and estimate the model by fixed-effects. However, we do not expect this to sensitively improve results since explanatory variables are structural variables and the time period, eight years, is too short to allow for enough (within) variance.

IV. Results

Results for estimating for all products (SITC 0-8) and all countries together are shown in Table 2. Apart from the panel data estimations, most coefficients are significant, present the expected signs and are not sensitive to the different specifications and estimation methods - with the exception of *maxgdp*. Results are especially robust for the variable that is the main concern of this paper: the stock of immigrants.

We find evidence for our hypothesis of a positive effect of the presence of immigrants in a country and its bilateral intra-industry trade with the home country of immigrants. We obtain positive and significant (at 1% level) coefficients for this variable in all three groups of estimations. It is also noteworthy that we achieve this result even when others trade transaction costs proxy variables are included in the

estimations (i.e. *dist* and *eu*) and for any combination of them[10]. This result, hence, appears to be quite robust to different estimation methods and specifications. So, our results show that the transaction costs reduction due to immigration contribute more to increase intra-industry trade than inter-industry trade and supports the consideration of this variable as a positive determinant of intra-industry trade.

In order to deeper understand this result we make two additional tests. Those tests take into account two issues directly related to the two economic phenomena that are our object of analysis. First, the fact that IIT is more relevant for manufactured than for non-manufactured products. Second, the fact that IIT occurs mainly between developed countries while immigration seems to be a South to North matter. Doing this, we also check for the sensitivity of our results.

Both theory and empirical evidence show that IIT tends to be a higher share of total trade in manufactures than in other types of goods because, among other reasons, manufactures are usually more differentiated goods. We argue that immigration increases bilateral trade by reducing trade transaction costs associated to product information availability. So, the stock of immigrants in a country should have a stronger effect on the share of IIT in this kind of products than in others, less differentiated, goods. This result would support our main hypothesis.

Table 3 shows the results of estimating equation (2) separately for manufactured goods (defined as SITC 5 to 8) and non-manufactured goods (SITC 0 to 4)[11].

[10] Being the only exception – on 8 combinations – when only *dist* and *imm* are included and the model is estimated as a logistic function by NLLS.

[11] As long as we don not have IIT observations that equals zero or one, we do not find qualitative differences in results when estimating our model by the logistic transformation of the GL index or by a

Estimations for manufactured products present a higher power of explanation than estimations for non-manufactured products. Although immigration has a positive and significant effect on IIT index both for manufactured and non-manufactured products, coefficients for manufactured products are more than ten times higher than for non-manufactured products in all four specifications. So, not only the stock of immigrants has a positive effect on the bilateral IIT index between host and home countries but this effect is stronger for IIT in manufactured goods, the ones which present a higher level of differentiation and, hence, are more negatively affected by trade transaction costs.

This is a fact that trade between developing and developed countries is mainly inter-industry trade. One could think that estimating together for all types of countries would hide the fact that immigration from developing countries maybe does not have any effect on IIT index because it is a very small phenomenon between developed and developing countries when immigration may seem to be a South to North matter. For this reason we next identify the effect of immigration on IIT share separately for immigrants from developing and developed countries. Which results we expect? It depends on the level of similarity between trading countries. If we assume that developed countries have more similarities with Spain than developing ones, we can identify from the literature about the link between immigration and trade some reasons to expect that the effect of immigrants from developing countries on IIT share could be bigger than the effect of immigrants from developed ones.

Immigrants will contribute the more to trade transaction costs reduction as the bigger the differences between host and home countries. In general, we can accept that

logistic function, and for the sake of brevity, in so on we only present results for the logistic transformation of the GL index

the lack of information about political, social and economic institutions and about the products and varieties of products offer in both countries (and the mechanism to transmit it) should be bigger between a developed and a developing country than between two developed countries. Immigrants from South countries living in a North country will bring with them and transmit more additional information from and to their home countries than immigrants from a developed country. This is a similar argument to the one used by Girma and Yu (2002). They argue and find evidence that immigrants in UK from Common Wealth countries (more similar institutions to UK) will bring with them less additional information than non-Common Wealth immigrants (less similar institutions to UK) and, hence, will contribute less to trade flows. Moreover, as Rauch (1999) argues, this effect will be greater for differentiated products than for products traded on organized exchanges (usually, homogeneous products, like raw materials). So, we can expect that immigration from developing countries will have a bigger effect on Spanish bilateral IIT than immigration from developed countries, especially for manufactured goods.

We define developed countries as OECD members and developing countries as non-OECD members. To identify the effect on IIT share of each type of immigrants we allow for the elasticity of immigration to vary across the different groups of countries[12]. We define a dummy variable for those countries that are members of the OECD and another for those that do not. Then a multiplicative variable of these dummies and imm_{it} is included in the model instead of the immigrant's stock variable (*immOECDit* and

[12] This is the methodology used by Girma and Yu (2002).

immNOECDm$_{it}$, respectively). The main advantage of this methodology is that we can easily test for the statistical significance of the coefficients differences[13].

As estimating results in Table 4 show, non-OECD immigrants have a bigger positive effect on IIT index than OECD immigrants and this difference is statistically significant. However, and according to the existing literature, the fact of being a developed country or / and European Union Member Estate have a positive effect on IIT with Spain. When estimating separately for manufactured (Table 5) and non-manufactured products (Table 6), we obtain different results that also confirm our hypothesis. Immigrants from non-OECD countries have a bigger positive effect than immigrants from non-OECD countries on IIT in manufactures, as for all kind of goods together, while they have a lower effect (in fact none) on IIT in non-manufactures. So, those results confirm that immigrants from Southern countries help IIT in manufactured products more than immigrants from Northern countries done. In the case of OECD immigrants, they help to increases both IIT index on manufactures and non-manufactured products, but this positive effect is bigger for manufactures, according to results in Table 3. Those results are robust to different specifications.

V. Concluding remarks

This paper argues and provides evidence that the stock of immigrants in a country have a positive effect on the share of intra-industry trade in total bilateral trade between this country and immigrants home country. The paper links the recent literature

[13] It posses, however, the disadvantage that including a dummy for OECD (or for non OECD) countries in the model should affect the variable *kldif*$_{it}$ since differences in factor endowments tend to be bigger between OECD and non OECD countries than between OECD countries. So, *kldif*$_{it}$ and the dummy for OECD countries could capture the same economic phenomena.

of immigration and trade and the literature about the determinants of intra-industry trade. The first suggest that immigration helps trade by reducing trade transaction costs and that this would benefit more trade in differentiated than in homogeneous products. The second states that intra-industry trade occurs mainly in differentiated goods and that trade cost reduction would benefit more intra than inter-industry trade. Hence, immigration would increase the share of intra-industry trade in total trade since it contributes more to the increase of intra than inter-industry trade.

We test this hypothesis using Spanish data and departing from the theoretical and empirical models developed by Helpman (1987) enhanced according to Hummels and Levinshon (1995) and adding a variable which measures the stock of immigrants in Spain by partner country.

We find clear evidence for this hypothesis. First, results show that there is a positive effect of immigration on the index of intra-industry trade. This result is robust both to different estimation methods and to the inclusion on the specification of other variables commonly used to proxy for trade transaction costs. Second, we find that this positive effect is stronger for manufactured products than for non-manufactured ones. Manufactured products tend to be more differentiated and are more sensitive to product information availability than non-manufactured products. Finally, we find that the effect of immigration on IIT is bigger for trade between Spain and partners that are less developed than with countries that present a more similar level of development. As long as information about products, product variety and socio-economic institutions is more easily available between developed countries (specially if they are member of the same economic integration process) than between developed and non-developed countries,

immigrants from less developed countries contribute more to increase information availability and, hence, to reduce trade transaction costs than immigrants from developed countries.

This paper, to our knowledge, is the first attempt to analyse the impact of immigration on intra-industry trade. However, we think that this is not the only contribution of this paper. Two additional ones are, first, to help in the knowledge of the determinants of intra-industry trade and, second to contribute to the better understanding of the economical effects of one of the most challenging political and sociological phenomena for developed countries now and in a close future: immigration.

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Table 1: *Stock of immigrants in Spain by country and bilateral IIT trade, 1991-1998 averages.*

Country	Number of immigrants	G-L index
United Kingdom	62537	38.4
Germany	40931	49.6
Portugal	34639	33.1
France	29310	43.4
Italy	18676	34.1
USA	14463	18.4
Netherlands	12616	26.0
Canada	10694	5.5
Belgium	8883	35.6
Sweden	6081	17.4
Denmark	4636	14.7
Norway	2970	5.5
Japan	2955	15.5
Finland	2727	6.1
Ireland	2568	8.3
Austria	2160	20.6
Switzerland	1174	19.2
Greece	602	6.5
OECD countries	*258620*	*22.1*
Morocco	79116	4.6
Argentina	19243	3.8
Peru	14497	1.3
Dominican Republic	14008	1.7
Philippines	9982	3.6
Colombia	7193	2.4
Venezuela	6758	2.1
Chile	6446	1.1
Cuba	6431	0.7
India	6333	3.9
China	5748	3.4
Brazil	5044	4.1
Gambia	4122	0.1
Algeria	3969	1.4
Poland	3950	11.5
Senegal	3887	2.3
Mexico[(a)]	3874	5.0
Uruguay	3847	1.4
Ecuador	2650	2.9
Cape Verde	2106	0.0
Equatorial Guinea	2053	0.1
Iran	1766	0.1
Romania	1458	1.5
Bulgaria	1063	2.0
Non-OECD countries	*215542*	*2.5*

Source: INE and COMEXT.

(a) Although Mexico jointed the OECD by the middle of our sample (in 1994), we decided to include it in the non-OECD group because its still great economic differences with respect to the OECD group of countries.

Table 2: *The effect of immigration on IIT*.
(Dependent variable: Grubel and Lloyd index of intra-industry trade adjusted for categorical

	Logistic transformation of GL index (OLS)				**Logistic distribution. P**	
	(1)	**(2)**	**(3)**	**(4)**	**(1)**	**(2)**
kldif	-0.34***	-0.62***	-0.35***	-0.78***	0.08**	-0.18***
	(-3.11)	(-4.41)	(-3.14)	(-5.24)	(2.20)	(-3.22)
mingdp	0.93***	0.98***	0.92***	0.95***	0.36***	0.92***
	(9.32)	(9.68)	(9.42)	(9.51)	(6.56)	(11.99)
maxgdp	-0.08	-0.13	-0.11	-0.33***	0.45***	0.14**
	(-0.71)	(-1.05)	(-0.94)	(-2.68)	(7.48)	(2.23)
dist	-0.10	-0.45***	----	----	-0.35***	-0.88***
	(-0.98)	(-4.52)			(-5.69)	(-11.42)
eu	1.55***	----	1.66***	----	1.51***	----
	(8.27)		(11.94)		(12.21)	
imm	0.21***	0.29***	0.23***	0.40***	0.12***	0.07
	(3.06)	(3.79)	(3.40)	(5.37)	(2.86)	(1.09)
constant	-17.18	-11.69	-17.31	-10.21	-18.02	-14.62
	(-7.50)	(-4.72)	(-7.56)	(-3.66)	(-16.91)	(-9.12)
R^2	0.6943	0.6599	0.6936	0.6414	0.8400	0.7278
Obs.					336	

All estimations include time-dummy variables.
(a)The Hausman test rejects the hypothesis that the individual effects are uncorrelated with th
We cannot compare the value of the estimated coefficient in OLS and NLLS estimations, o
transform the coefficient in the NLLS estimation of the logistic transformation)
Except for *constant*, ***, **, *, indicates significance at the 1%, 5% and 10% level respectiv
t-ratios, based on heteroscedasticity robust standard errors, are given in parentheses.

Table 3: *The effect of immigration on IIT by product type. All countries*.
(Dependent variable: Grubel and Lloyd index of intra-industry trade adjusted for categorical aggregation).

	MANUFACTURES (SITC 5-8)				**NON MANUFACTURES (SITC 0-4)**			
	Logistic transformation of GL index (OLS)				**Logistic transformation of GL index (OLS)**			
	(1)	**(2)**	**(3)**	**(4)**	**(1)**	**(2)**	**(3)**	**(4)**
kldif	-0.39***	-0.64***	-0.40***	-0.78***	0.01***	-0.07	0.01	-0.02***
	(-3.55)	(-4.63)	(-3.57)	(-5.40)	(3.74)	(-1.44)	(3.35)	(-3.35)
mingdp	1.00***	1.04***	0.99***	1.02***	0.004***	0.01***	0.003***	0.005***
	(9.06)	(9.34)	(9.15)	(9.23)	(4.16)	(4.81)	(2.89)	(2.91)
maxgdp	-0.16	-0.20*	-0.20	-0.40***	0.01***	0.01	0.01*	-0.01
	(-1.34)	(-1.65)	(-1.60)	(-3.19)	(3.19)	(1.61)	(1.90)	(-1.44)
dist	-0.13	-0.44***	----	----	-0.02***	-0.04***	----	----
	(-1.51)	(-5.14)			(-3.83)	(-7.33)		
eu	1.35***	----	1.49***	----	0.11***	----	0.13***	----
	(7.59)		(10.88)		(10.51)		(12.12)	
imm	0.22***	0.29***	0.24***	0.40***	0.014***	0.019***	0.0163***	0.03***
	(3.62)	(4.40)	(4.03)	(6.11)	(4.53)	(5.07)	(4.87)	(6.29)
constant	-15.84	-11.06	-16.03	-9.62	-0.44	-0.03	-0.46	0.10
	(-6.97)	(-4.58)	(-6.98)	(-3.54)	(-4.01)	(-0.30)	(-4.11)	(0.68)
R^2	0.7233	0.6977	0.7221	0.6805	0.6018	0.4291	0.5852	0.2804
Obs.	336							

All estimations include time-dummy variables.
Except for *constant*, ***, **, *, indicates significance at the 1%, 5% and 10% level respectively.
t-ratios, based on heteroscedasticity robust standard errors, are given in parentheses.

Table 4: *The effect of immigration on IIT by OECD status: all products.*
(Dependent variable: Grubel and Lloyd index of intra-industry trade adjusted for categorical aggregation).

	ALL PRODUCTS			
	Logistic transformation of GL index (OLS)			
	(1)	**(2)**	**(3)**	**(4)**
kldif	0.06	0.03	0.06	0.02
	(1.10)	(0.67)	(1.06)	(0.52)
mingdp	0.85***	0.86***	0.85***	0.85***
	(8.64)	(8.74)	(8.74)	(8.74)
maxgdp	-0.22*	-0.32***	-0.25**	-0.41***
	(-1.81)	(-2.63)	(-2.07)	(-3.80)
dist	-0.06	-0.16	----	----
	(-0.67)	(-1.54)		
eu	0.75***	----	0.80***	----
	(3.98)		(4.14)	
imm*OECD	0.11	0.20***	0.13**	0.27***
	(1.63)	(3.14)	(2.09)	(5.89)
imm*NOECD	0.49***	0.48***	0.49***	0.49***
	(4.15)	(4.16)	(4.18)	(4.20)
OECD	4.99***	4.57***	4.90***	4.21***
	(4.21)	(4.00)	(4.07)	(3.66)
constant	-19.95	-17.02	-19.90	-16.29
	(-8.41)	(-8.27)	(-8.28)	(-7.89)
R^2	0.7445	0.7387	0.7442	0.7368
Obs.	336			
Wald test (Prob.)	7.88 (0.0053)	4.98 (0.0263)	7.17(0.0078)	3.30 (0.0704)

All estimations include time-dummy variables.
Except for *constant*, ***, **, *, indicates significance at the 1%, 5% and 10% level respectively.
t-ratios, based on heteroscedasticity robust standard errors, are given in parentheses.

Table 5: *The effect of immigration on IIT by OECD status: manufactures.*
(Dependent variable: Grubel and Lloyd index of intra-industry trade adjusted for categorical aggregation).

	MANUFACTURES (SITC 5-8)			
	Logistic transformation of GL index (OLS)			
	(1)	**(2)**	**(3)**	**(4)**
kldif	-0.01	-0.03	-0.01	-0.04
	(-0.23)	(-0.78)	(-0.23)	(-0.93)
mingdp	0.93***	0.94***	0.92***	0.92***
	(8.53)	(8.60)	(8.63)	(8.65)
maxgdp	-0.32***	-0.39***	-0.35***	-0.48***
	(-2.62)	(-3.35)	(-2.92)	(-4.39)
dist	-0.09	-0.17*	----	----
	(-1.08)	(-1.81)		
eu	0.56***	----	0.64***	----
	(3.24)		(3.50)	
imm*OECD	0.16**	0.23***	0.18***	0.29***
	(2.26)	(3.55)	(2.88)	(6.28)
imm*NOECD	0.45***	0.45***	0.46***	0.46***
	(4.69)	(4.70)	(4.70)	(4.72)
OECD	4.26***	3.94***	4.12***	3.57***
	(4.12)	(3.97)	(3.95)	(3.62)
constant	-17.92	-15.71	-17.84	-14.96
	(-8.52)	(-8.47)	(-8.31)	(-8.04)
R^2	0.7660	0.7628	0.7654	0.7608
Obs.	336			
Wald test (Prob.)	6.26 (0.0128)	4.13 (0.0430)	5.44 (0.0203)	2.45 (0.1185)

All estimations include time-dummy variables.
Except for *constant*, ***, **, *, indicates significance at the 1%, 5% and 10% level respectively.
t-ratios, based on heteroscedasticity robust standard errors, are given in parentheses.

Table 6: *The effect of immigration on IIT by OECD status: non-manufactures.*
(Dependent variable: Grubel and Lloyd index of intra-industry trade adjusted for categorical aggregation).

	NON MANUFACTURES (SITC 0-4)			
	Logistic transformation of GL index (OLS)			
	(1)	**(2)**	**(3)**	**(4)**
kldif	0.02***	0.02***	0.02***	0.02***
	(4.17)	(3.80)	(4.08)	(3.50)
mingdp	0.004***	0.005***	0.003***	0.004***
	(5.08)	(5.08)	(4.08)	(3.44)
maxgdp	-0.005	-0.01**	-0.01*	-0.03***
	(-0.99)	(-2.51)	(-1.83)	(-4.86)
dist	-0.01***	-0.02***	----	----
	(-3.26)	(-4.49)		
eu	0.08***	----	0.09***	----
	(7.41)		(7.87)	
imm*OECD	0.03***	0.04***	0.03**	0.05***
	(5.93)	(7.08)	(6.08)	(8.09)
imm*NOECD	-0.00	-0.00	-0.00	-0.00
	(-0.36)	(-0.41)	(-0.16)	(-0.11)
OECD	-0.24***	-0.28***	-0.25***	-0.33***
	(-5.07)	(-5.30)	(-5.23)	(-6.11)
constant	-0.10	0.21	-0.09	0.31
	(-0.87)	(1.89)	(-0.77)	(2.66)
R^2	0.6568	0.5950	0.6501	0.5656
Obs.		336		
Wald test (Prob.)	31.96 (0.0000)	43.32 (0.0000)	33.44 (0.0000)	58.60 (0.0000)

All estimations include time-dummy variables.
Except for *constant*, ***, **, *, indicates significance at the 1%, 5% and 10% level respectively.
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