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Abstract

This paper seeks to identify the relation between a country's trade share and its income level. We ask whether this relation changed between 1995 and 2005 and whether there has been an observable shift toward increased trade variety for high income countries. In order to address these questions, we employ a trade decomposition method that consists of dividing the overall trade share of a given country into the extensive and intensive margins and the latter is further decomposed into price and quantity components. A country's relative income has a smaller effect on trade share vis-a-vis the EU 15 than was previously the case, primarily because relatively low income countries now export large quantities of goods also.

JEL: F12, F15, F43

Keywords: International Trade, Product Differentiation, Economic Integration, Exports.

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1 Introduction

The period from 1995 to 2005 has been characterised by a sizable increase in the value of international trade and a growing public awareness of the increasing level of international integration generally referred to as globalisation. China and other Asian countries have received considerable media attention focusing on their increased share of trade with wealthy countries and their contribution to global imbalances. Furthermore, Europe has continued its own efforts at creating a single market via the EU and the introduction of the Euro.

This paper seeks to identify what is the relation between a country's trade share and it income level and whether this relation has changed in recent years. In order to address this question, we employ the trade decomposition method used by Hummels and Klenow (2002, 2005). This involves dividing the overall trade share of a given country into the extensive and intensive margins and the latter is further decomposed into price and quantity components. This means that it is possible to observe estimates of relative export variety and relative quantities.

The data used for the analysis come primarily from the European Commission External Trade database, which contains data relating to both intra and extra-EU trade. Trade data from the CEPII BACI database are also employed as these allow comparisons over a wider number of reporter countries.

This paper improves upon Hummels and Klenow (2005) by applying their method to more reliable, more detailed data which covers multiple years. The paper also innovates by incorporating time varying coefficients. The results of the analysis suggests that all countries, particularly those with low incomes, trade more with the EU now than at the beginning of the sample. In the 48 country sample, this is shown by the declining coefficient on the relative income variable in the regressions with overall export share as the dependent variable. The importance of the intensive margin in explaining the additional trade share of wealthier countries with the EU-15 has diminished. This manifests itself by consistency of magnitude of the relative income coefficient in the extensive margin while the coefficient on relative income in the intensive margin regressions declined.

A country's relative income has a smaller effect on trade share than was previously the case, primarily because relatively low income countries now export large quantities of goods also. Variety and quality (as proxied by the price component) are the remaining characteristic of wealthy countries' exports. These results can be explained using theories that suggest that trade volumes and varieties will increase with a reduction in trade costs such as Melitz (2003) and Chaney (2008).

This paper also highlights the interrelation between the extensive margin and the price component generated by the limited level of disaggregation of the data. This knowledge also supports the assertion that variety is the key trade characteristic of relatively high income countries.

The paper is divided into 6 further sections. Section 2 provides a brief review of some of the related literature, section 3 outlines the decomposition methodology. Section 4 outlines the data sources and presents some descriptive statistics. Section 5 presents the results of regressions and provides analysis. Finally section 6 highlights the main findings and delivers some concluding remarks.

2 Related Literature

Although numerous theoretical papers on topics related to quality and variety in trade have existed for some time it is only in recent years that a large number of empirical papers have begun to emerge. The key factor contributing to this is the use of data from international trade rather than that collected for consumer price indices. Previous methods tended to focus on a small number of products for which high quality data were available (Izquierdo and Matea 2001). The theoretical foundations of the trade data papers is broad, extending from Dixit-Stiglitz (1975) and Krugman (1979), Flam and Elhanen(1987) to Feenstra (1994) and Melitz (2003). Using international trade data as a starting point, a wide variety of questions have been addressed empirically.

Hummels and Klenow (2005) forms the template for this paper. Using cross-sectional international trade data they decomposed exports into extensive and intensive margins, with price and quantity components for the latter. The extensive margin measures the fraction of world trade that occurs in those market-categories in which country it participates. The intensive margin measures a country's share of world trade in those market categories in which it participates. The price and quantity components of the intensive margin show whether a country's exports are high or low in price or quantity relative to other country's exports. They represent relative price and quantity indices. Their results found that 63 percent of the increase in total exports associated with a larger labour force (a measure of economy size) arises from increases in the number of varieties of products exported.

Hummels and Klenow (2005) begin by outlining four theoretical economic models and their predictions regarding trade flows, specifically the measures explained above and their relationship with the dependent variables, relative income per worker and relative workforce.

The first model, the Armington (1969) national differentiation model is based on the assumption that each country produces a single variety in each category so there is no extensive margin and quality does not vary across countries.[1] A country with more workers increases its trade share simply by increasing quantities. This leads to a fall in the price component as the country moves along its export demand curve.

The second model, Acemoglue and Ventura (2002), expands upon the Armington model by including endogenous capital accumulation and an endogenous number of varieties. The number of varieties is proportional to the number of people employed. Thus they predict that the extensive margin will be positively related to the size of the workforce. Furthermore, higher productivity countries will produce a higher quantity of each good and this will result in lower prices. The model implies that countries with a higher relative income per worker will export more intensively via relatively higher quantities but at relatively lower prices.

Krugman (1980) modeled countries as producing an endogenous number of varieties proportional to the size of the economy. The quantity of each variety sold (in a simple version of the model) is proportional to the size of the country and all varieties are sold at the same unit price. This implies that the extensive margin will

[1] Although in the measure used below includes increases in the extensive margin based on an increase in the number of trade partners.

increase with the size of the economy but the intensive margin will not. As all of the firms are identical and all trade costs are variable either none are all of the firms will trade. If all firms trade then a further reduction in variable trade costs will not lead to an increase in the extensive margin and will operate only on the intensive margin as the existing firms will trade more. Therefore, the model predicts that that variable trade costs have a stronger impact on trade the higher the elasticity of substitution.

Finally, Hummels and Klenow (2005) outline a quality differentiation model in which quality levels vary across countries but productivity and variety do not. Countries with more workers will produce higher quantities of each variety while, because higher income countries produce higher quality goods, relative income per worker is anticipated to be positively correlated with the price component. Thus, the intensive margin increases with both relative income per worker and relative workforce but the model predicts no relationship between the extensive margin and either of the explanatory variables.

When Hummels and Klenow (2005) ran regressions using these margin and indices as dependent variables, they found that 72 percent of the increase in overall exports associated with higher income per head emanates from the extensive margin. Similarly, they found that 63 percent of the increase in total exports associated with a larger labour force (a measure of economy size) arises from increases in the number of varieties of products exported.

Hummels and Klenow (2005) further decompose the intensive margin into its price and quantity components. However, in the case of exports, the importance of the intensive margin is small relative to the extensive margin. The results indicate that a 10 percent increase in the labour force is associated with a 2.5 percent increase in the quantity component of the export margin as compared with a 5.4 percent increase in the extensive margin. The price component of the intensive margin increases just 0.4 percent with a ten percent increase in the labour force. However both price and quantity components have a coefficient of approximately 0.2. This implies that the prices of exports are relatively much more strongly linked to the income per head of each country. It should be noted however that the R^2 statistic for the price component is relatively small (0.25). Indeed, the R^2 statistic for the intensive margin is smaller than the same statistic for the extensive margin (0.62 for the former, 0.76 for the latter).

On the consumer side, early papers such as Dixit and Stiglitz (1975) and Krugman (1979) posited the potential gains from increased variety. According to the latter, an increase in import varieties could occur either via a fall in trade costs or through growth in the foreign country. If trade costs fall, countries will gain through the import of new varieties. If the foreign country grows it will produce and thus export more varieties.

An empirical investigation of the proposition that consumers may derive higher levels of utility from the availability of a greater number of varieties is explored by Broda and Weinstein (2004). They suggest that firms with relatively high productivity choose to compete on quality using their productivity advantage to produce high-quality, high-price varieties rather than concentrating on a low-cost strategy. Hallak (2003) produces results that show that as countries become more capital and skill abundant they produce more highly priced and vertically differentiated

varieties.[2]

Kaplinsky and Santos-Paulino (2005) examine trends in the unit prices of European Union imports of manufactured goods for the period 1988-2000. The data employed come from the European Commission COMEXT database of external trade. The data used are HS 2-, 4-, 6-, and 8-digit categories (up to 10 thousand product categories) on a monthly basis. The authors use Augmented Dickey Fuller tests to identify which unit price series (by country and product category) contain a unit root, that is, the price series is non-stationary. They find that, with the exception of upper middle income exporters, there is a general tendency for the incidence of non-stationarity to increase with the degree of sectoral disaggregation as the data move from 2- to 4- to 6-digit levels disaggregation.

Our work is related to several of these previous empirical contributions and represents another application of international trade data to the study of trade variety. Most obviously, this paper relates to Hummels and Klenow (2005) but improves on this work by applying their method to data that are more complete, more up to date, more highly disaggregated and include a time dimension. The interpretation of our results makes reference to the new trade theory literature such as Melitz (2003).

Melitz (2003) is highly cited and is one of the key papers in the "new new trade" literature (Baldwin and Rober-Nicoud 2008). In the 1980s, papers like Krugman (1979) incorporated imperfect competition and increasing returns to scale and Melitz (2003) expands on this by introducing a model that incorporates firm heterogeneity into general equilibrium trade models that are consistent with the firm-level facts documented papers such as Bernard et al (2005).

Each nation is assumed to have a single primary factor, labour, which is an index of country size and a single consumption-good sector. There are a continuum of firms, M, each producing a different variety. All firms have the same fixed cost but have different productivity levels. This can be thought of as leading either to the production of a symmetric variety at lower marginal cost or a higher quality variety at the equal cost. Either way firms choose the same profit maximising markup. The model uses Dixit-Stiglitz monopolistic competition and ice-berg trade costs.

In autarky a firm's market share deviates from 1/M when its productivity (and therefore its marginal cost) deviates from the country average. More productive firms produce more, have higher revenues, charge lower prices and have higher profits. If a firm's productivity level is below the autarky cutoff level it does not produce as it cannot make positive profits.

In free trade only the firms with a productivity level high enough reach the export cutoff export. Thus there are three types of firms; first, there are firms that don't reach the domestic cutoff and who therefore close down, second, there are firms that reach the domestic cutoff but not the export cutoff and who only sell to the domestic market and third, there are firms that have productivity not less than both cutoffs and these firms sell in both domestic and foreign markets. The addition of foreign firms operating in the domestic market means that there is an increase the productivity level required for domestic firms to remain in production. Thus a move

[2]Vertically Differentiated: Differentiated on the basis of quality. (Ferrari vs Fiat)
Horizontally Differentiated: Similar in overall quality, but offering different combinations of characteristics (Blue Toyotas and Red Toyotas)

to free trade will reduce the number of domestic firms operating in the domestic market while those firms that reach the export cutoff productivity level will export and thus increase in size thus this increase the aggregate productivity level. This will lead to an increase in aggregate welfare as, although the varieties consumed by domestic consumers may decrease (typically they increase), the productivity effect will dominate.

An important result of the Melitz (2003) model relates to what happens if there is a reduction in the variable trade costs. This decreases the cutoff productivity required to be an exporter. So more domestic and foreign firms will export. More foreign firms will enter the domestic market meaning that the cutoff productivity required to be a domestic producer is higher, so there will be fewer domestic firms but more domestic exporters. Firms will lose a proportion of their domestic sales but exporting firms will gain foreign market share.

In contrast, if fixed costs fall only new exporters will gain foreign market share but not extant exporters. In either case, the more productive firms grow larger while some of the least productive exit, resulting an increase in the aggregate level of productivity. The number of firms in the model is a positive function of the number of workers and the aggregate price level is a positive function of the number of firms. Welfare also relates positively to the number of firms as this will lead to greater product variety.

In the context of the results presented in this paper, it is important to note the original Melitz (2003) model assumes identical nations. Furthermore, unlike in reality, there is no variation in trade costs between countries which means that any firms that exceed the export cutoff level of productivity will export to all markets.

Feenstra and Kee (2004) examine the effect of increases in export variety on total factor productivity. Using panel data relating to US imports from the rest of the world, export market share is regressed against a measure of relative export variety as well as a number of other control variables, including relative factor endowments. The theoretical basis of this relationship is based upon Melitz (2003). One can gain an intuitive understanding of the model by thinking of the following scenario. If the set of firms that exports is determined on the basis of productivity, where only the most productive firms export, then a decrease in trade barriers exposes both exporting and non-exporting firms to increased competition. As a result some of the least productive firms, those who do not export, will be forced to exit the market. At the same time, the productivity threshold for exporting is reduced, so more of the most productive firms will now be exporters. Thus, the average productivity of firms increases.

The export variety measure is taken as indicative of the number of firms that export. This model therefore predicts that, the higher the level of export variety, the higher the level of productivity. As higher labour productivity is associated with increasing wages, one might therefore expect a higher variety of outputs to be associated with higher income levels.

Helpman, Melitz and Rubinstein (2007) develop an international trade model with heterogenous firms that predicts positive as well as zero trade flows across pairs of countries and allows the number of exporting firms to vary across destination countries. This facilitates the decomposition of the impact of trade frictions on trade flows into the intensive and extensive margins. The definition of the extensive

margin used in Helpman, Melitz and Rubinstein (2007) refers to the fraction of firms that export and is therefore related, but not equivalent, to the measure referred to in this paper.

Helpman, Melitz and Rubinstein (2007) find that the reponse of trade to changes in trade costs is related to the income level of the trading countries. They divide trade flows into North-North, North-South and South-South[3]. Their model predicts, and it is confirmed in their data analysis, that when trade costs related to distance fall, the responses of the extensive margin of trade are more important for less developed countries.

Chaney (2008) expands on Krugman (1980) and Meltiz (2003) by allowing for asymmetric countries with asymmetric trade barriers. In the aforementioned Krugman model, if the elasticity of substitution between country varieties is low, then consumers will be willing to pay higher prices for a particular variety and therefore the effect of trade barriers will be limited. Chaney (2008) predicts the opposite. Contrary to Krugman (1980), a low elasticity of substitution means that each firm has some market power and therefore, the low productivity new entrants (marginal firms) arising from a reduction in trade costs will be able to command a significant market share. A low elasticity of substitution implies that consumers will not be willing to pay a premium for imported varieties and therefore low productivity firms will have a small market share and make little difference to aggregate trade.

In the interpretation and conclusion section, I propose that the elasticity of substitution varies systematically across countries according to income levels.

3 Data Decomposition

By comparing the prices and quantities of exports by different countries to a given market-categories, Hummels and Klenow (2005) were able to estimate differences in varieties and relative prices and quantities across exporters. The decomposition employed below is based on the methodology and used by Hummels and Klenow (2005) except that in this case, the margins and indices include the time subscript t.

Hummels and Klenow (2005) decompose trade into what they call the intensive and extensive margins, where Overall is a country's overall share of world exports, EM is the extensive margin, IM is the intensive margin. P and Q are the relative price and relative quantity components (indices) of the intensive margin.

$$\text{Overall} = \text{EM} * \text{IM} \tag{1}$$

$$\text{IM} = \text{P} * \text{Q} \tag{2}$$

These values are then logged and regressed against log GDP and against log income per worker and log number of workers. Thus, the regression should show the effect of Irish economic growth and prosperity on the composition of trade. For exporting country j at time t:

[3]So by this definition, the EU 15 data used here only cover North-North and North-South trade

$$\text{Overall} = \frac{X_{jt}}{X_{wt}} \tag{3}$$

Where X_{jt} is nominal exports of country j and X_{wt} is the level of nominal rest of world exports from all exporters to all markets.

$$\text{EM}_{jit} = \frac{\sum_{i \neq j} \sum_{s \in X_{jist}} X_{wist}}{X_{wt}} \tag{4}$$

The extensive margin for country j measures the fraction of world exports that occur in those market-categories in which country j exports. This idea is based on the import variety growth measure from Feenstra (1994) except that it varies cross sectionally rather than across time. According to Hummels and Klenow (2005), ceteris paribus, if a country concentrates all of its exports in a small number of market categories, it will have a higher intensive margin and a lower extensive margin. The extensive margin can be understood as a weighted count with each market category receiving a weight according to its share in world exports. Thus, it is indicative of the variety of products traded, weighted by their volume (monetary value) in world trade.

$$\text{IM}_{jit} = \frac{X_{jt}}{\sum_{i \neq j} \sum_{s \in X_{jist}} X_{wist}} \tag{5}$$

where X_{Wist} is world exports to country i in product category s at time t, and X_{jst} is the set of market-categories (I, s) pairs for which $x_{jist} > 0$, where x_{jist} is the level of nominal exports of country j to country i in product category s at time t. The intensive export margin measures a country's share of world exports in those market categories in which it exports.

The intensive margin is further decomposed into price and quantity components. These are Fisher Ideal indices commonly used in the literature. The data are aggregated across market-categories to calculate the relative export price index and the export quantity index for each country. The relative export price index for exporter j is:

It is important to remember that the measures used in the data decomposition are shares of total European and world trade, the total value of which increased markedly during the period. So a countryis intensive margin might fall despite increasing its export volume in its market categories.

Hummels and Klenow (2005) use the Feenstra (1994) derived exact price index for a country's intensive margin. Country m's imports from j versus k are given by:

$$\text{P}_{jit} = \prod_{m \in M_j} \prod_{i \in I_{jmt}} \left[\frac{p_{jmit}}{p_{kmit}} \right]^{w_{jmit}} \tag{6}$$

where w_{jmit} is the logarithmic mean of s_{jmit} (the share of category i in country j's exports to m at time t) and s_{kmit} (the share of category i in k's exports to m at time

t where $i \in I_{jmt}$).[4] The quantity index was then derived by dividing the intensive margin by the above price index.

The geometric mean of each country j's decomposition accross I_{-j} markets to get:

$$\mathrm{IM}_{jt} = \prod_{i \in I_{-j}} (IM_{jit})^{a_{jit}} \tag{8}$$

$$\mathrm{EM}_{jt} = \prod_{i \in I_{-j}} (EM_{jit})^{a_{jit}} \tag{9}$$

$$\mathrm{P}_{jt} = \prod_{i \in I_{-j}} (P_{jit})^{a_{jit}} \tag{10}$$

$$\mathrm{X}_{jt} = \prod_{i \in I_{-j}} (X_{jit})^{a_{jit}} \tag{11}$$

The weight a_{jit} is the logarithmic mean of the share of i in the overall exports of j and W_{-j-i} at time t respectively (normalized so that a_{jit}'s sum to 1 over the set $I-j$).

The price component calculated in this case is calculated with reference to weights arising from the relative share of a country in a given market category relative to the world. Thus, extreme price observations corresponding to very small quantity observations do not have an undue effect on the overall price indices and could, therefore, be allowed to remain in the data.

4 Data and Descriptive Statistics

The data utilised are eight digit, combined nomenclature (CN) European trade data. These CN data are based on six digit Harmonised System (HS) data, the CN eight digit categories being subdivisions of six digit HS categories. At its most extensive and detailed the data consist of in excess of 18 million observations. The eight digit data have almost twice as many categories as the six digit HS data. There is a disadvantage to using these data, however, as a proportion of the categories are reclassified each year, thus affecting the precise values of the various margins. It was considered that, given the macro focus of the analysis, the advantage of having twice the definition outweighed the cost in the comparability of the individual categories.[5]

[4] where:

$$w_{jmt} = \frac{\left[\frac{s_{jmit} - s_{kmit}}{\ln s_{jmit} - \ln s_{kmit}}\right]}{\left[\sum_{i \in I_{jmt}} \frac{s_{jmit} - s_{kmit}}{\ln s_{jmit} - \ln s_{kmit}}\right]} \tag{7}$$

Using the price component used in the Hummels and Klenow (2002) working paper rather than that used above from Hummels and Klenow (2005) journal article, tended to deliver higher values of the price component as it appeared to be more sensitive to observations with very high relative unit prices and very low quantities.

[5] If 6-digit data are used, the pattern of the data does not change but the extensive margin increases and the intensive margin decreases.

The reporter countries included in this analysis are the EU-15. That is: Austria, Belgium, Germany, Denmark, Spain, Finland, France, Great Britain, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Sweden. The data for Luxembourg are included in that of Belgium for the period prior to 1999. Initially, the partner countries were the above plus Canada, Switzerland, China, Hong Kong, Hungary, Japan, the Republic of Korea, Malaysia, Norway, Poland, Singapore, Thailand, Turkey, Taiwan and the United States of America. These partner countries were selected as they are the largest exporters to the EU-15 group of countries. The data set was subsequently expanded to include data for Algeria, Argentina, Australia, Brazil, Bulgaria, Chile, Czech Republic, Indonesia, Israel, Kazakhstan, Libya, Morocco, Mexico, New Zealand, Romania, Russia, Saudi Arabia, Slovakia, Slovenia, South Africa and Ukraine [6]. This gives a total of 48 partner countries.

When the CEPII BACI data are employed, these 48 partner countries are also reporters. This means that the data relate each of the 48 countries exports to 48 partners. While this is obviously a very desirable property of the data it should be noted that there remains an issue relating to missing data observations in the BACI data.

In order to control for the effect of remoteness on the various trade margins, where appropriate a term was included for the remoteness between each countries economic center of gravity and Luxembourg. This variable came from the CEPII. More sophisticated remoteness measures were also employed based on papers by Coe et al (2002) and Battersby and Ewing (2005). The latter measure of remoteness was calculated as follows:

$$R_i = d_{Wi} = \left(\frac{\sum_{j \neq i} Y_j}{\sum_{j \neq i} \frac{Y_j}{d_{ij}^{\beta}}} \right)^{\frac{1}{\beta}} \tag{12}$$

where Y_j represents country j GDP, and where d_{Wi} represents to the distance to the rest of the world weighted by country GDP. When applied using a fully specified gravity equation, β represents the value of the coefficient on distance. Battersby and Ewing (2005) assume that β takes a value of 1 as they state that this is close to some empirical estimates and simplifies the calculation. This paper also assumes that β takes a value of 1. Higher values of β imply a greater distance effect, while lower values tend to decrease it. As we shall see below, the more rudimentary distance from Luxembourg remoteness variable actually performed better in terms of statistical significance in the EU-15 sample. Luxembourg, Belgium and Holland are the countries with the lowest remoteness measure for the data relating to Europe.

The remoteness variable controls for trade costs that vary with distance, as it costs more to transport goods over longer distances (transport costs can be considered variable costs). These are not the only trade costs, however, as when goods enter a destination they are subject to a variety of trade policy-related barriers that raise the costs of trading such as tariff and non-tariff barriers. There may also be trade and transportation costs that occur within borders[7]. If goods are invoiced in

[6] Data was also retrieved for India, Iran, Nigeria and Tunisia but was excluded the data required was not avaiable for the entire sample period.

[7] Chen and Novy (2009) describe trade costs as follows: "Broadly defined, trade costs include

the destination country currency, as is usually the case (Fitzgerald and Haller 2008, Cook and Devereux 2005) there may be costs related to exchange rate risk if the trading partners do not share the same currency. The sample period has coincided with further trade liberalisation in terms of both within the EU and via the WTO and bilateral trade agreements. The expansion of the European Union and the introduction of the Euro are also particularly important for the European data. All of these issues will have contributed to falling trade costs which will not be captured by the remoteness variable.

Although these trade costs are not directly observable, papers such Anderson and Van Wincoop (2004), Novy (2008) and Chen and Novy (2009) attempt to estimate them from trade data. Chen and Novy (2009) find that trade costs have fallen faster in the EU than in other developed countries over the period 1999-2003. This attribute this to the EU single market program, the introduction of the Euro and the Schengen agreement[8]. They also find a strong role for technical trade barriers that are the focus for considerable attention at WTO negotiations. Anderson and Van Wincoop (2004) find that trade costs are large for developed countries and even larger for developing countries. They also suggest that high value to weight items are less penalised by transport costs.

Over the period 1995-2005 the value of exports to the EU-15 for the 55 sampled countries increased from 1.36 trillion euro to 2.52 trillion euro per annum. As can be seen in Figure 1, Germany has consistently had the highest share of exports to the rest of Europe at around 26 percent of the total while Kazakhstan and New Zealand had the lowest share. Over the period, the US share declined somewhat while the shares of Ireland and China increased.

At the same time, the general trend was toward increasingly extensive trade. Most country's extensive margin increased over the period while their intensive margin declined (see Figures 2 and 3) though overall trade volumes increased. The share of all countries must sum to 1. For a given overall share, an increase in the extensive margin must correspond to a decrease in the intensive margin. Within the intensive margin, the price component for most countries increased while the quantity component declined (see Figures 4 and 5). So it appears that the trend for the sampled countries over the period 1995-2005 was for a greater variety of exports to a greater number of markets at relatively higher prices and smaller quantities.

In general, small quantities are associated with higher prices in the data. For a given overall share of trade, an increase in the extensive margin will lead to smaller quantities in each category as well as a decrease in the intensive margin. *Ceteris paribus*, within the intensive margin a reduction in the quantity component is frequently associated with an increase in the price component. Thus increases in the extensive margin may contribute to an increase in the price component.

The countries that have the highest extensive margin with respect to the EU-15

any cost of engaging in international trade such as transportation costs, tariffs, non-tariff barriers, informational costs, time costs, different product standards, exchange rate costs and local distribution costs, among others."

[8]Baldwin and Di Nino (2006) is one of a series of papers written by Baldwin, with a selection of co-authors, on the effect of the Euro on intra-eurozone trade. The aim of the paper is to investigate the channel through which the advent of the Euro promoted trade. Using 6-digit UN Comtrade data, this paper finds that the Euro boosted intra-eurozone trade via the extensive margin. That is the single currency has increased the variety of products traded and not just the volumes.

are Germany, France and the Netherlands. These general patterns and characteristics do not change a great deal when subsamples are examined.

Data for the income and employment were taken, where possible, from the International Monetary Fund, International Financial Statistics database (IFS).[9] The income and employment variables are in levels rather than in relative terms as in Hummels and Klenow (2005) as this simplifies the interpretation of the coefficients.

5 Regressions

5.1 48 Country Sample

Following Hummels and Klenow (2002, 2005) the regression equation was specified as:

$$overall_j = \alpha_t + \beta_{1t} YL_j + \beta_{2t} L_j + \beta_{3t} R_j + \beta_{4t} EUdummy_j + \epsilon_j \tag{13}$$

where *overall* refers to country j overall share of exports to the EU 15. YL refers to the income per worker employed, and L refers to the number of workers employed in country j. R refers to the remoteness measures outlined above.[10]

This regression was run separately for each year 1995-2005 on 48 countries exports to the EU 15. Thus, the value of the constant and coefficients were allowed to vary over time. Hummels and Klenow (2005) only run the regression on data for one year so it is not possible to see whether the relation between the variables changed over time. The results of the regression using the above specification are presented in Table 1. The same regessions were then run with the extensive and intensive margin and price and quantity components as dependent variables (see Tables 2, 3, 4 and 5) . In this way, it is possible to identify what proportion of the variation in overall share associated with a given explanatory variable is associated with each margin and component (see Tables 6, 7 and 8). The Wald test is applied to test whether the coefficients at the beginning of the sample period are statistically significantly different from those at the end of the sample.

The results shown in Table 6 indicate that the proportion of a country's overall share of European Trade associated with relative income accounted for by the extensive margin actually increased from 37 to 57 percent, with a corresponding decrease in the intensive margin. This implies that in 1995, 37 percent of the higher export share of wealthier countries was accounted for those countries exporting a larger number of varieties. By 2005, this increased to 57 percent.

The extensive margin is increasingly important in explaining the additional trade share of wealthier countries. This manifests itself by consistency of magnitude of the relative income coefficient in the extensive margin while the coefficient on relative income in the intensive margin regressions declined. When the Wald test was applied the relative income coefficient in the extensive margin regression remained

[9] IFS data were not available for Saudi Arabia, Singapore and Taiwan so the relevant data were taken from the Nation Master, Statistics Singapore and National Statistics, Republic of China respectively.

[10] Hummels and Klenow did not include a remoteness or an EU dummy variable.

reasonably stable over the sample period, while there was a decline in the same variable's coefficient in the overall regression that was statistically significant at the 99 percent significance level (see Table 1). This decline was delivered by 0.32 decline in the intensive margin, which was significant at the 99 percent significance level (see Table 3).

The decline in the intensive margin coefficient on relative income was the result of a changes in the quantity component (see Table 5). The coefficient on the relative income variable in the quantity component regressions was very close to being statistically significant at the beginning of the sample period but not toward the end. The Wald test indicates that it is statistically different at the end of the period compared to at the beginning of the period.

Within the intensive margin, the relative income coefficient in the price component equations remained reasonably stable over the sample period (see Table 4). The price component used here is sometimes considered as a proxy for quality as the positive coefficient suggests that higher income countries can charge higher prices per unit (weight).

The most obvious reason for a consumer to be willing to pay such a premium is that he prefers this product i.e. it is of higher quality[11].

The results presented in Table 6 show a considerable fall in the proportion of overall share associated with relative income that is attributable to the quantity component. This can be interpreted as indicating that export quantities are no longer a characteristic of wealthy countries, as lower income countries now export large quantities of merchandise to Europe also. Rather, it is the variety of exports that remains a characteristic of high income countries.

The labour coefficient on the number of workers is negative, though not statistically significant, in the later price component regressions (see Table 4). The coefficient in the quantity component regression is positive as countries with a larger number of workers export more goods[12]

Hummels and Klenow (2005) find that the extensive margin accounts for around 60 percent of the greater exports of larger economies. The results here indicate that the extensive margin only accounts for around 30 perent of the greater exports of larger countries. The UN data used by Hummels and Klenow (2005) is not as detailed or as reliable as the data used here although they did include a larger number of countries. As we have selected countries on the basis of the share of trade with the EU, our sample will include a smaller number of small and low income countries. It is also worth noting that when they used more detailed data on exports to the U.S. they found that the proportion of extra trade associated with the number of

[11] Hummels and Skiba (2002) explore this and other alternative hypotheses to quality differentials for explaining differences in prices across destination countries. One obvious hypothesis is that firms are not perfectly competitive. They argue that even if we assume that firms are monopolistically competitive prices would then include both marginal cost of production and a mark-up.

Alessandria and Kaboski (2007) argue that, rather than being indicative of variations in quality, the correlation between relative income and the relative price of imports represent firms pricing to market. That is, a firm will charge consumers in a rich country more than they would consumers in a poor country.

[12] If we assume imperfectly competitive markets, countries with more workers may be further down their products demand curve and thus be subject to a lower price, thereby providing an incentive to produce a larger number of varieties.

workers that was attributable to the extensive margin fell to 53 percent.

Of the variation in overall share explained by remoteness, at the beginning of the sample period, 61 percent was due to the intensive margin specifically the quantity component. In excess of 30 percent was attributable to the extensive margin (see Table 8). The proportion attibutable to the intensive margin increased considerably over the period. There were considerable variations in the value of the coefficient on remoteness in the price component regressions presented in Table 4 but the coefficient was not significant.

The price component might be expected to increase with remoteness due to Alchian-Allen effects but decrease due to the negative effect of remoteness on the extensive margin. Alchian-Allen effects predict that countries that are more remote experience higher fixed costs to trade meaning that only higher value products can be sold profitably in more distant markets[13]. Thus the ambiguous sign and lack of statistical significance is not surprising. The coefficients on the remoteness variable indicate that more remote countries trade less, with smaller quantities and fewer varieties.

From Table 5 we can see that there has been an increase in the coefficient on remoteness in the quantity component regressions over the sample period and the results of the Wald test imply that this is statistically significant at the 10 percent significance level. This suggests that the trade costs that vary with remoteness have had an increasingly negative effect on relative quantities.

Using transaction based data, Bernard et al (2007) actually find that distance has a positive effect on the intensive margin. Lawless and Whelan (2008) explain this as being the result of fixed costs reducing the number of firms that participate in exporting being primarily those marginal firms that would only have exported small quantities if the cost of exporting were slightly lower. If these firms no longer export then the average quantities of the firms that do export will be larger as only large firms will export. This effect is not captured in this paper because of the more aggregated nature of the data. In this paper, the effect of distance on the intensive margin, the total quantity or value of a good exported from one country to another, is negative. At the same time the value of the remoteness coefficient declined in magnitude over the sample period. The Wald test indicated that this decline was statistically significant at the 99 percent significance level.

A decline in trade costs associated with distance should lead to an increase in the overall share of more distant countries. If fixed (in terms of quantities) costs associated with distance decline then this should operate primarily through the extensive margin as more firms will be able to export a wider variety of product

[13]Choi, Hummels and Xiang (2006) use 4 digit data from the UN Comtrade database but primarily that developed by Feenstra et al (2004).

These data are used to construct a "price dis-similarity index". Comparable data on income distributions come from the Luxembourg Income Study (LIS). This covers 30 countries over 20 years. These data are used to construct a "income dis-similarity index". They then test whether these indices are correlated. When estimating values for omitted quantity data Choi, Hummels and Xiang (2006) incorporate the idea of Alchian-Allen effects. That is, the presence of international transportation costs lead firms to ship high quality goods abroad while holding lower quality goods for domestic consumption.

This concept was examined, and was not rejected as a valid hypothesis in Hummels and Skiba (2002). The results of this paper may be subject to bias arising from this phenomenon.

to a larger group of markets (more distant countries). However, there would be no increase in relative quantities arising from a decline in fixed costs[14]

At the same time the magnitude of the EU dummy coefficient varies a great deal over the period. In the final year of the sample EU membership only has a positive statistically significant effect on the extensive margin. It should be noted that the a large number of Eastern European countries joined the European Union in 2004. Nevertheless, up to 2003 the extensive margin was the primary channel through which EU members higher trade share materialised. This suggests that EU membership may reduce the fixed costs of trade.

5.2 Subsample Results and Issues

A sub-sample of EU-15 source and destination countries were compared in isolation.[15] The results for this group differed considerably from those generated by the 48 country sample. Indeed, many of the apparent trends were the exact opposite of those described above. For instance, the results suggest that, at the beginning of the sample period, 31 percent of the higher export share of wealthier countries was associated from their exporting a wider variety of products to a wider variety of destinations (see Table 9). By 2005, however, the equivalent figure had declined to just 3 percent. There was also a simultaneous increase in the price component of the intensive margin.

When the standard deviation, maximum and minimum of the larger sample was examined the following patterns were discernible (see Table 10). The standard deviation of the extensive margin becomes smaller over time and both the maximum and minimum values are closer to the mean. For the EU-14 countries this is driven primarily by the increasing extensive margin of smallest and most distant countries such as Greece, Finland and Portugal, as they began exporting in more market-categories. In other words, the most extreme observations in the subsample converged to the mean over time. At the same time the largest and least remote countries, Germany, the Netherlands and Belgium, saw no increase in the extensive margin.

The key constraint on the extensive margin of the largest, least remote countries is that, because of the data, they can only produce a maximum of 100 percent of the 6 or 8 digit market categories to 100 percent of the markets in the sample. By increasing the number of markets in the larger samples this increased the scope for

[14]This is not an entirely satisfactory explanation as, although the difference between the remoteness coefficients at the beginning and the end of the sample period are not statistically significantly different according to the Wald test, there does appear to be and increase in the coefficient on remoteness. Perhaps the fall in other trade costs, those not associated with remoteness, released one constraint on world trade. The resultant, more natural flow of trade would follow a pattern of trade more closely corresponding to that dictated by geographic factors, or what trade would look like if there were no barriers to trade other than transport costs. For instance, due to political factors, Russia may choose not to trade with Georgia or the US with Cuba and so Russia and America might prefer to purchase wine from France and Cigars from Brazil even though Georgia and Cuba are closer. If at some point trade resumed between the aforementioned partners, it seems logical that there would be a substitution away from the more distant countries good towards the more proximate country. This would manifest itself in a larger coefficient on distance.

[15]14 observations as it was necessary to treat Belgium and Luxembourg as one country as this was the format of the data in the first half of the sample.

the maximum values to increase. However, when the 14 country sub-sample was examined the number of markets was even more constrained and the upper limit of the extensive margin was reached.

In order to confirm this, the extensive margin calculated on the basis of countries participation in the export product categories only (not taking into account market destination). It becomes clear that the upper bound of the extensive margin has indeed been reached as the maximum value is, when rounded two decimal places, 100 percent (see Table 11). That is the largest exporting country in the larger sample, participates in 100 percent of product categories. By 2005 the smallest exporting country actually exports in product categories that account for 15 percent of exports, up from 5 percent in 1995. As a consequence, the standard deviation is seen to decline over the sample period.

When regressions were run on the data for the 14 country sub-sample it is clear that the summary statistics for the price component are also increasing.[16] The level of statistical significance of the relative income variable in the price component regressions increases over the course of the sample period. In 1995 this coefficient is not significant at even the 10 percent level, whereas between 2002 and 2004 the coefficient is significant at the 10 percent level and the absolute value of the coefficient has increased from 0.06 to 0.37. The standard deviation of relative income per worker in the 14 country sample is greater than 25 percent of the mean and considerably larger for the bigger samples as they include more low income countries. So a country with an income per worker one standard deviation above the sample average can expect to have export price index that is almost 10 percent higher than the average.

The fact that the price component increases over the sample period is likely due to the fact that a higher price component can be taken as being representative of a country exporting a unobserved within category variety which has a higher price. Logically, if a country exported a homogenous good at a higher price, nobody would buy it because it would be possible to buy the exact same good at a lower price from somewhere else. We can see from Table 9 that, although not statistically significant, there is corresponding decline in the extensive margin coefficient on relative income per worker. This can be interpreted as indicating that countries have reached the upper bound of the 6 or 8 digit extensive margin measure and that any subsequent increase in variety is in unobserved within category varieties. If these new categories vary in price from the old categories, for instance by being more expensive, then this will become apparent through a change (increase) in the price component. This is entirely consistent with what is observed. Thus the statistically significant increase in the price component can be interpreted as an increase in the export share of wealthier countries accounted for by their exporting more expensive varieties.

Furthermore, the limited size of the extensive margin is also likely to explain the fact that the relative workforce variable was found to be positively related the price component in the 48 country sample. The results indicate that larger countries have higher extensive margins and it seems logical to suggest that this increase in variety is not confined to the observed eight digit (or six digit) varieties but also unobserved

[16]This may represent scale effects in the summary statistics as the values are in current euro (see Table 10) However, the variables in the regression analysis are all logged and thus scale effects are eliminated in the regression analysis.

within category varieties.

The fact that the extensive margin and price component are increasing over the sample period implies that more varieties are being exported. As shall be discussed in the interpretation section, this is consistent with what would occur if there was a fall in trade costs according to papers such as Melitz (2003) and Chaney (2008). This also seems logical given with what was occurring in Europe at this time as the sample period covers a decade where European market integration continued and exchange rate risk was eliminated for many of the sample countries as a result of the introduction of the Euro.

5.3 BACI Data

Data from the BACI database were also utilised as this allows one to look at the pattern of trade for a larger group of reporters. That is, with the European Commission data, the reporter countries are limited to those in the EU, whereas the BACI is based on United Nations Comtrade Data which cover all the countries in the 48 country sample. The European Commission data only tell us about trade versus the 15 EU reporter countries. It is possible that the patterns observed and outlined above are unique to Europe.

Before proceeding, it is worth noting that there are a number of issues with the BACI data. The main problem arises from the absence of comparable quantity data for a considerable portion of observations in the original Comtrade data. Where quantities are not available, the BACI dataset has inserted estimates. In the context of the this paper, the data are of limited usefulness because of the short sample period. Nevertheless, it was considered worthwhile to investigate whether differences in the results would arise as a result of including more reporter countries.

In contrast to the European regressions, there is little evidence of a decline in the relative income coefficient in the overall export share regression and certainly no statistically significant change (see Table 12). Table 17 below presents the proportion of overall trade attributable to each of the margins and components that is associated with relative income per worker. These measures are for 48 partner countries' trade with 48 reporter countries (rather than 48 partner countries' trade with 15 reporter countries). The reporters (importers) in this case have, on average, lower incomes than European countries. The remoteness measure used in these regressions is the Battersby and Ewing (2005) measure discussed above.

The results from the BACI data presented in Table 17 show that the intensive margin accounts for over 70 percent the proportion of overall share associated with income per worker while over 60 percent was accounted for by the quantity component. The equivalent number for the European Commission dataset was around 40 percent and 0 percent at the end of the sample period. For Non-European countries the relationship between exporter income and export quantities appears to be stronger, although the coefficients are highly significant in both sets of regressions. This may be due to the lower income levels of the reporter countries in the larger sample. That the change in the coefficients is not statistically significant is also a noticeable feature of the BACI results but this is hardly surprising considering the short sample period. The exception to this is the set of regressions on the price component. The results of a Wald test indicate that the increase in the income per

worker coefficient from the beginning to the end of the sample period is significant at the 10 percent significance level.

The BACI data are only 6-digit and thus contains roughly half as many product categories as the European Commission data. It is possible therefore, that the increase in the price component observed here is symptomatic of the same issue outlined in the case of the 14 country sample. Once again, at 15 percent, the extensive margin has a much smaller role in explaining the extra export share of larger countries than was reported in Hummels and Klenow (2005). As was the case for the European Commission data, the sample of countries here is smaller than that used in their paper and includes fewer very small, very poor countries. As was the case for the EU-15 data, the effect of distance appears to operate increasingly through its effect on relative quantities as illustrated by the increasing coefficient and the ratio presented in Table 19. By 2004, essentially all the variation in a countries trade share associated with remoteness was explained by differences in the intensive margin. This pattern is similar to that discussed for the European Commission data although the change in the coefficient was not found to be statistically significant. Once again it is clear from the results presented in the table that there is an interaction between the extensive margin and the price component as the signs on both variables switch in 2004.

6 Interpretation and Conclusions

The simplest narrative that can be used to explain the results is that trade costs have fallen over time (Novy 2008) and may have fallen more rapidly for low income countries that have more recently begun to be integrated into the globalised economy, than was the case for high income countries (Frensch 2008)[17]. At the same time, the estimated fixed costs of trade with the EU have fallen faster than in other developed countries over the period 1999-2003 (Chen and Novy 2009). The fall in trade costs has lead to an increase in the volume of world trade and in particular the share of trade of low or middle income countries in South East Asia and Eastern Europe[18]. There has also been an increase in intra-European trade. This trade and economic integration has allowed low income countries such as China to specialise in the production of large volumes of relatively homogenous or low quality goods characterised by high elasticity of substitution where productivity advantages arising from the relatively low input costs found in low income countries are critical (see Schott 2008)[19]. High income countries (or countries with relatively large endowments of human and other capital) have continued to export differentiated or relatively high

[17] Although only one element of trade costs, some evidence is provided by the WTO trend in average tariffs data. Developing countries average tariff in 1995 was 16.6% and declined to 10.7% in 2005. Over the same period high income OECD countries average tariff declined from 6.3% to 3.4%.

[18] Alternatively, growth of production capacity in devloping countries also likely to have increased export supply and therefore global trade as described by O'Rourke and Williamson (2000) for historical data. Low income countries would necessarily specialise in low quality homogenised, high elasticity of demand goods as they are not endowed with sufficient human and other capital.

[19] Also, a considerable body of literature on income volatility exists which reports that developing countries are more likely to have higher export concentration (Jansen, Lennon and Piermartini 2009).

quality goods (see Fontange et al 2008, Hallak 2003 and Broda and Weinstein 2006) characterized by low elasticity of substitution where costs are of lower importance.

Thus there are differences in the elasticity of substitution of firms and industries that are related to country income level which have consequences for the effects of a decline in trade costs. As described in Chaney (2008) a higher elasticity makes the intensive margin more sensitive to changes in trade barriers whereas it make the extensive margin less sensitive. As trade costs have fallen those relatively high elasticity/low income countries have had relatively larger increases in their intensive margins while low elasticity/low income countries have had relatively larger increases in their extensive margin. However due to data constraints, the full extent of the extensive margin in high income countries is not observable. Thus the income coefficient on the intensive margin and quantity compenent have fallen as relatively poor countries have increased their relative export quantities. At the same time, the income coefficient on the price component has remained the same and the decline in the extensive margin small and is not stastically significant despite the limitations in its measurement outlined above.

This paper applies the Hummels and Klenow (2005) methodology to more reliable, more detailed data which cover multiple years. The paper also innovates by incorporating time varying coefficients. The results of the analysis suggests that all countries, particularly those with low incomes, trade more with the EU now than at the beginning of the sample. In the 48 country sample, this is shown by the declining coefficient on the relative income variable in the regressions with overall export share as the dependent variable. The extensive margin is increasingly important in explaining the additional trade share of wealthier countries. This manifests itself by consistency of magnitude of the relative income coefficient in the extensive margin while the coefficient on relative income in the intensive margin regressions declined.

A country's relative income has a smaller effect on trade share than was previously the case, primarily because relatively low income countries now export large quantities of goods also. Variety and quality (as proxied by the price component) are the remaining characteristic of wealthy countries exports. These results are consistent with theories that suggest that trade volumes and varieties will increase with a reduction in trade costs such as Melitz (2003) and Chaney (2008).

This paper also highlights the interrelation between the extensive margin and the price component generated by the limited level of disaggregation of the data. This knowledge also supports the assertion that variety is the key trade characteristic of relatively high income countries.

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Table 1: Cross-Sectional Regressions for 48 countries' exports to Europe with overall export share as dependent variable over the period 1995-2005

	1995	1997	1999	2001	2003	2005
Income per Worker	0.784	0.774	0.638	0.499	0.49	0.406
	[0.115]***	[0.092]***	[0.085]***	[0.077]***	[0.088]***	[0.074]***
Number of Workers	0.662	0.69	0.683	0.62	0.617	0.64
	[0.063]***	[0.053]***	[0.047]***	[0.046]***	[0.050]***	[0.045]***
Remoteness	-0.491	-0.58	-0.585	-0.617	-0.614	-0.52
	[0.088]***	[0.074]***	[0.071]***	[0.077]***	[0.079]***	[0.078]***
EU Dummy	0.378	0.191	0.192	0.018	0.016	0.273
	[0.304]	[0.261]	[0.259]	[0.277]	[0.281]	[0.235]
Constant	-10.077	-9.331	-7.835	-5.802	-5.839	-5.945
	[1.148]***	[0.911]***	[0.979]***	[0.847]***	[1.051]***	[1.100]***
Observations	48	48	48	48	48	48
R^2	0.86	0.88	0.88	0.86	0.85	0.84

Notes: Robust standard errors in parenthesis, *significant at 10; **significant at 5; ***significant at 1 percent significance level.

Table 2: Cross-Sectional Regressions for 48 countries' exports to Europe with extensive margin as dependent variable over the period 1995-2005

	1995	1997	1999	2001	2003	2005
Income per Worker	0.293	0.306	0.266	0.242	0.269	0.232
	[0.086]***	[0.068]***	[0.059]***	[0.047]***	[0.051]***	[0.041]***
Number of Workers	0.202	0.203	0.186	0.173	0.181	0.188
	[0.043]***	[0.037]***	[0.034]***	[0.028]***	[0.031]***	[0.026]***
Remoteness	-0.191	-0.204	-0.182	-0.166	-0.161	-0.082
	[0.052]***	[0.047]***	[0.046]***	[0.039]***	[0.038]***	[0.037]**
EU Dummy	0.13	0.081	0.047	0.116	0.068	0.325
	[0.147]	[0.122]	[0.118]	[0.095]	[0.097]	[0.095]***
Constant	-2.696	-2.715	-2.348	-2.201	-2.584	-2.951
	[0.913]***	[0.712]***	[0.661]***	[0.521]***	[0.561]***	[0.541]***
Observations	48	48	48	48	48	48
R^2	0.63	0.7	0.66	0.71	0.72	0.75

Notes: Robust standard errors in parenthesis, *significant at 10; **significant at 5; ***significant at 1 percent significance level.

Table 3: Cross-Sectional Regressions for 48 countries' exports to Europe with intensive margin as dependent variable over the period 1995-2005

	1995	1997	1999	2001	2003	2005
Income per Worker	0.491	0.468	0.371	0.257	0.221	0.174
	[0.069]***	[0.080]***	[0.087]***	[0.074]***	[0.083]**	[0.084]**
Number of Workers	0.459	0.487	0.497	0.447	0.436	0.452
	[0.044]***	[0.045]***	[0.046]***	[0.045]***	[0.049]***	[0.049]***
Remoteness	-0.299	-0.376	-0.404	-0.451	-0.453	-0.437
	[0.064]***	[0.067]***	[0.064]***	[0.069]***	[0.073]***	[0.085]***
EU Dummy	0.247	0.11	0.145	-0.098	-0.052	-0.052
	[0.217]	[0.220]	[0.228]	[0.241]	[0.247]	[0.240]
Constant	-7.381	-6.616	-5.487	-3.601	-3.255	-2.993
	[0.793]***	[0.907]***	[0.996]***	[0.781]***	[0.944]***	[1.152]**
Observations	48	48	48	48	48	48
R^2	0.78	0.77	0.78	0.75	0.73	0.67

Notes: Robust standard errors in parenthesis, *significant at 10; **significant at 5; ***significant at 1 percent significance level.

Table 4: Cross-Sectional Regressions for 48 countries' exports to Europe with price component as dependent variable over the period 1995-2005

	1995	1997	1999	2001	2003	2005
Income per Worker	0.2	0.191	0.178	0.18	0.2	0.185
	[0.026]***	[0.029]***	[0.033]***	[0.034]***	[0.033]***	[0.040]***
Number of Workers	0.009	0.009	-0.017	-0.011	-0.017	-0.047
	[0.019]	[0.021]	[0.026]	[0.026]	[0.024]	[0.029]
Remoteness	0.046	0.055	0.065	0.071	0.05	0.011
	[0.023]*	[0.027]**	[0.033]*	[0.033]**	[0.029]*	[0.042]
EU Dummy	-0.068	-0.047	-0.019	-0.028	-0.078	-0.305
	[0.071]	[0.081]	[0.098]	[0.098]	[0.089]	[0.111]***
Constant	-2.293	-2.259	-2.132	-2.174	-2.228	-1.547
	[0.305]***	[0.331]***	[0.390]***	[0.401]***	[0.392]***	[0.548]***
Observations	48	48	48	48	48	48
R^2	0.64	0.59	0.52	0.5	0.56	0.46

Notes: Robust standard errors in parenthesis, *significant at 10; **significant at 5; ***significant at 1 percent significance level.

Table 5: Cross-Sectional Regressions for 48 countries' exports to Europe with quantity component as dependent variable over the period 1995-2005

	1995	1997	1999	2001	2003	2005
Income per Worker	0.291	0.278	0.193	0.077	0.021	-0.011
	[0.082]***	[0.089]***	[0.083]**	[0.080]	[0.096]	[0.088]
Number of Workers	0.451	0.478	0.514	0.458	0.453	0.499
	[0.045]***	[0.044]***	[0.036]***	[0.040]***	[0.049]***	[0.046]***
Remoteness	-0.345	-0.432	-0.469	-0.521	-0.503	-0.449
	[0.076]***	[0.079]***	[0.071]***	[0.084]***	[0.088]***	[0.094]***
EU Dummy	0.316	0.157	0.164	-0.07	0.026	0.253
	[0.245]	[0.247]	[0.230]	[0.265]	[0.288]	[0.260]
Constant	-5.088	-4.357	-3.354	-1.427	-1.027	-1.446
	[0.830]***	[0.938]***	[0.914]***	[0.771]*	[0.982]	[1.131]
Observations	48	48	48	48	48	48
R^2	0.73	0.74	0.8	0.76	0.73	0.74

Notes: Robust standard errors in parenthesis, *significant at 10; **significant at 5; ***significant at 1 percent significance level.

Table 6: Proportion of Overall Share of Exports to Europe associated with relative income per worker (48 Countries)

Income per Worker	1995	1997	1999	2001	2003	2005
Overall Export Share	1	1	1	1	1	1
Extensive Margin	0.37	0.40	0.42	0.48	0.55	0.57
Intensive Margin	0.63	0.60	0.58	0.52	0.45	0.43
Price Component	0.26	0.25	0.28	0.36	0.41	0.46
Quantity Component	0.37	0.36	0.30	0.15	0.04	-0.03

Note: Table shows the proportion of variation in overall share associated with coutry income attributable to each trade margin and component.

Table 7: Proportion of Overall Share of Exports to Europe associated with the number of workers (48 Countries)

Number of Workers	1995	1997	1999	2001	2003	2005
Overall Export Share	1	1	1	1	1	1
Extensive Margin	0.31	0.29	0.27	0.28	0.29	0.29
Intensive Margin	0.69	0.71	0.73	0.72	0.71	0.71
Price Component	0.01	0.01	-0.02	-0.02	-0.03	-0.07
Quantity Component	0.68	0.69	0.75	0.74	0.73	0.78

Note: Table shows the proportion of variation in overall share associated with country workforce size attributable to each trade margin and component.

Table 8: Proportion of Overall Share of Exports to Europe associated with remoteness (48 Countries)

Remoteness	1995	1997	1999	2001	2003	2005
Overall Export Share	1	1	1	1	1	1
Extensive Margin	0.39	0.35	0.31	0.27	0.26	0.16
Intensive Margin	0.61	0.65	0.69	0.73	0.74	0.84
Price Component	-0.09	-0.09	-0.11	-0.12	-0.08	-0.02
Quantity Component	0.70	0.74	0.80	0.84	0.82	0.86

Note: Table shows the proportion of variation in overall share associated with country remoteness attributable to each trade margin and component.

Table 9: Proportion of Overall Share of Exports to Europe associated with relative income per worker (14 Countries)

Income per Worker	1995	1997	1999	2001	2003	2005
Overall Export Share	1	1	1	1	1	1
Extensive Margin	0.18	0.13	0.11	0.12	0.13	0.14
Intensive Margin	-1.06	-0.81	-0.67	-0.97	-1.00	-1.42
Price Component	-1.32	-3.36	-3.78	-5.53	-5.54	-7.21
Quantity Component	22.99	17.86	15.66	20.14	20.35	25.74

Note: Table shows the proportion of variation in overall share associated with coutry income attributable to each trade margin and component.

Table 10: Summary Statistics for market-category measure 1995 and 2005

	1995			2005		
	std. dev.	min.	max.	std. dev.	min.	max.
Overall Export Share	0.05	0.00	0.28	0.04	0.00	0.26
Extensive Margin	0.24	0.05	0.95	0.22	0.15	0.97
Intensive Margin	0.05	0.01	0.29	0.04	0.01	0.26
Price Component	0.29	0.60	1.94	0.53	0.58	4.05
Quantity Component	0.04	0.00	0.24	0.04	0.00	0.23
Relative Income per Worker	26420	1070	84014	35291	2959	131770
Relative Employment	104.04	0.75	680.65	110.06	0.81	758.25

Table 11: Summary Statistics for category measure 1995 and 2005.

	1995			2005		
	std. dev.	min.	max.	std. dev.	min.	max.
Overall Export Share	0.04	0.00	0.20	0.03	0.00	0.19
Extensive Margin	0.20	0.19	1.00	0.16	0.30	1.00
Intensive Margin	0.04	0.00	0.20	0.03	0.00	0.19
Price Component	0.29	0.62	1.95	0.55	0.59	4.08
Quantity Component	0.03	0.00	0.17	0.03	0.00	0.17
Relative Income per Worker	34970	1070	84014	35291	2959	131770
Relative Employment	104.04	0.75	680.65	110.06	0.81	758.25

Table 12: Cross-Sectional Regressions for 48 countries' exports to 48 countries with overall export share as dependent variable over the period 2000-2004

	2000	2001	2002	2003	2004
Income per Worker	0.689	0.709	0.742	0.722	0.689
	[0.107]***	[0.104]***	[0.106]***	[0.110]***	[0.091]***
Number of Workers	0.685	0.69	0.693	0.694	0.694
	[0.079]***	[0.077]***	[0.080]***	[0.084]***	[0.076]***
Remoteness	-0.248	-0.268	-0.235	-0.283	-0.256
	[0.127]*	[0.118]**	[0.112]**	[0.114]**	[0.124]**
EU Dummy	-0.08	-0.079	-0.086	-0.122	-0.004
	[0.285]	[0.280]	[0.283]	[0.286]	[0.262]
Constant	-10.541	-10.593	-11.246	-10.754	-10.777
	[1.553]***	[1.553]***	[1.603]***	[1.685]***	[1.508]***
Observations	48	48	48	48	48
R^2	0.58	0.58	0.6	0.58	0.58

Notes: Robust standard errors in parenthesis, *significant at 10; **significant at 5; ***significant at 1 percent significance level.

Table 13: Cross-Sectional Regressions for 48 countries' exports to 48 countries with extensive margin as dependent variable over the period 2000-2004

	2000	2001	2002	2003	2004
Income per Worker	0.164	0.164	0.154	0.154	0.127
	[0.034]***	[0.036]***	[0.039]***	[0.040]***	[0.035]***
Number of Workers	0.107	0.103	0.102	0.098	0.098
	[0.023]***	[0.023]***	[0.024]***	[0.025]***	[0.021]***
Remoteness	-0.055	-0.051	-0.043	-0.061	0.027
	[0.050]	[0.049]	[0.050]	[0.047]	[0.068]
EU Dummy	0.075	0.081	0.098	0.058	0.23
	[0.074]	[0.074]	[0.082]	[0.078]	[0.116]*
Constant	-1.856	-1.874	-1.854	-1.698	-2.218
	[0.529]***	[0.567]***	[0.586]***	[0.598]***	[0.699]***
Observations	48	48	48	48	48
R^2	0.42	0.38	0.35	0.34	0.35

Notes: Robust standard errors in parenthesis, *significant at 10; **significant at 5; ***significant at 1 percent significance level.

Table 14: Cross-Sectional Regressions for 48 countries' exports to 48 countries with intensive margin as dependent variable over the period 2000-2004

	2000	2001	2002	2003	2004
Income per Worker	0.524	0.545	0.588	0.568	0.562
	[0.100]***	[0.095]***	[0.092]***	[0.092]***	[0.076]***
Number of Workers	0.578	0.587	0.591	0.596	0.597
	[0.071]***	[0.068]***	[0.068]***	[0.070]***	[0.064]***
Remoteness	-0.194	-0.217	-0.192	-0.222	-0.282
	[0.125]	[0.117]*	[0.108]*	[0.108]**	[0.140]*
EU Dummy	-0.155	-0.159	-0.184	-0.179	-0.234
	[0.253]	[0.245]	[0.242]	[0.243]	[0.251]
Constant	-8.685	-8.719	-9.393	-9.056	-8.559
	[1.429]***	[1.401]***	[1.387]***	[1.431]***	[1.514]***
Observations	48	48	48	48	48
R^2	0.54	0.55	0.59	0.58	0.58

Notes: Robust standard errors in parenthesis, *significant at 10; **significant at 5; ***significant at 1 percent significance level.

Table 15: Cross-Sectional Regressions for 48 countries' exports to 48 countries with price component as dependent variable over the period 2000-2004

	2000	2001	2002	2003	2004
Income per Worker	0.093	0.084	0.061	0.134	0.147
	[0.052]*	[0.050]	[0.056]	[0.036]***	[0.032]***
Number of Workers	-0.01	-0.007	-0.028	-0.025	-0.018
	[0.042]	[0.039]	[0.043]	[0.027]	[0.024]
Remoteness	0.023	0.016	0.066	0.027	-0.016
	[0.086]	[0.080]	[0.086]	[0.054]	[0.060]
EU Dummy	0.186	0.172	0.215	0.103	0.001
	[0.139]	[0.132]	[0.143]	[0.092]	[0.089]
Constant	-1.007	-0.848	-0.907	-1.417	-1.182
	[0.740]	[0.709]	[0.802]	[0.514]***	[0.527]**
Observations	48	48	48	48	48
R^2	0.22	0.21	0.17	0.48	0.48

Notes: Robust standard errors in parenthesis, *significant at 10; **significant at 5; ***significant at 1 percent significance level.

Table 16: Cross-Sectional Regressions for 48 countries' exports to 48 countries with quantity component as dependent variable over the period 2000-2004

	2000	2001	2002	2003	2004
Income per Worker	0.431	0.461	0.527	0.434	0.415
	[0.141]***	[0.142]***	[0.150]***	[0.116]***	[0.095]***
Number of Workers	0.588	0.595	0.619	0.621	0.615
	[0.074]***	[0.073]***	[0.078]***	[0.076]***	[0.071]***
Remoteness	-0.217	-0.234	-0.258	-0.25	-0.266
	[0.168]	[0.159]	[0.163]	[0.132]*	[0.168]
EU Dummy	-0.341	-0.331	-0.399	-0.282	-0.235
	[0.280]	[0.280]	[0.289]	[0.263]	[0.285]
Constant	-7.678	-7.871	-8.485	-7.639	-7.377
	[2.031]***	[2.021]***	[2.196]***	[1.670]***	[1.708]***
Observations	48	48	48	48	48
R^2	0.46	0.46	0.5	0.53	0.54

Notes: Robust standard errors in parenthesis, *significant at 10; **significant at 5; ***significant at 1 percent significance level.

Table 17: Proportion of Overall Share of Exports to 48 countries associated with relative income per worker (48 Countries, BACI data)

Income per Worker	2000	2001	2002	2003	2004
Overall Export Share	1	1	1	1	1
Extensive Margin	0.24	0.23	0.21	0.21	0.18
Intensive Margin	0.76	0.77	0.79	0.79	0.82
Price Component	0.13	0.12	0.08	0.19	0.21
Quantity Component	0.63	0.65	0.71	0.60	0.60

Note: Table shows the proportion of variation in overall share associated with country income attributable to each trade margin and component.

Table 18: Proportion of Overall Share of Exports to 48 countries associated with the number of workers (48 Countries, BACI data)

Number of Workers	2000	2001	2002	2003	2004
Overall Export Share	1	1	1	1	1
Extensive Margin	0.16	0.15	0.15	0.14	0.14
Intensive Margin	0.84	0.85	0.85	0.86	0.86
Price Component	-0.01	-0.01	-0.04	-0.04	-0.03
Quantity Component	0.86	0.86	0.89	0.89	0.89

Note: Table shows the proportion of variation in overall share associated with country workforce size attributable to each trade margin and component.

Table 19: Proportion of Overall Share of Exports to 48 countries associated with remoteness (48 Countries, BACI data)

Remoteness	2000	2001	2002	2003	2004
Overall Export Share	1	1	1	1	1
Extensive Margin	0.22	0.19	0.18	0.22	-0.11
Intensive Margin	0.78	0.81	0.82	0.78	1.10
Price Component	-0.09	-0.06	-0.28	-0.10	0.06
Quantity Component	0.88	0.87	1.10	0.88	1.04

Note: Table shows the proportion of variation in overall share associated with country remoteness attributable to each trade margin and component.

Figure 1: Overall Export Share of Selected Countries to the EU15

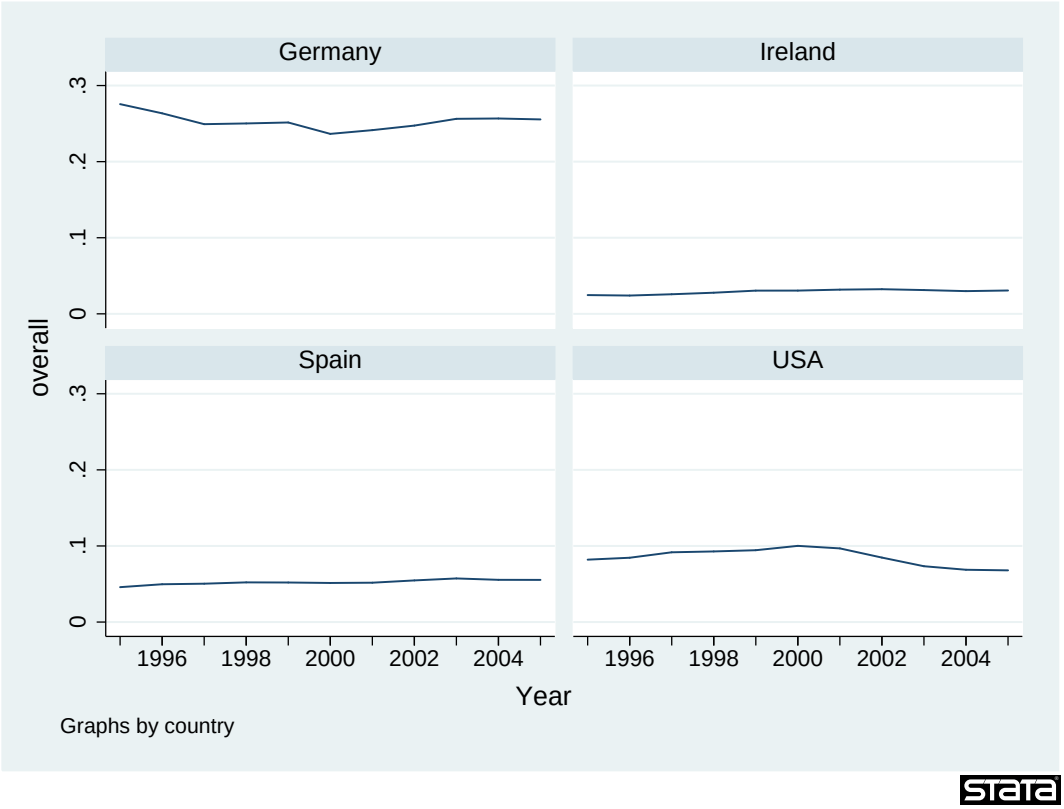

Figure 2: Extensive Margin of Exports to the EU15 for Selected Countries

Figure 3: Intensive Margin of Exports to the EU15 for Selected Countries

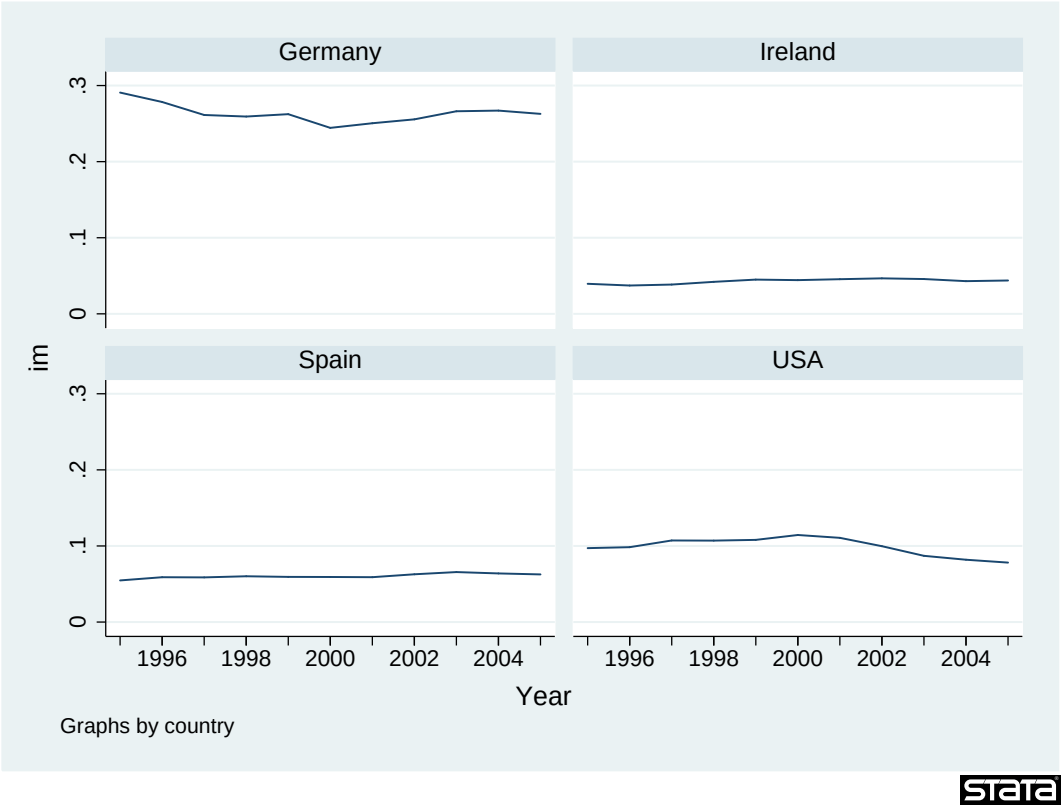

Figure 4: Price Component of the Intensive Margin of Exports to the EU15 for Selected Countries

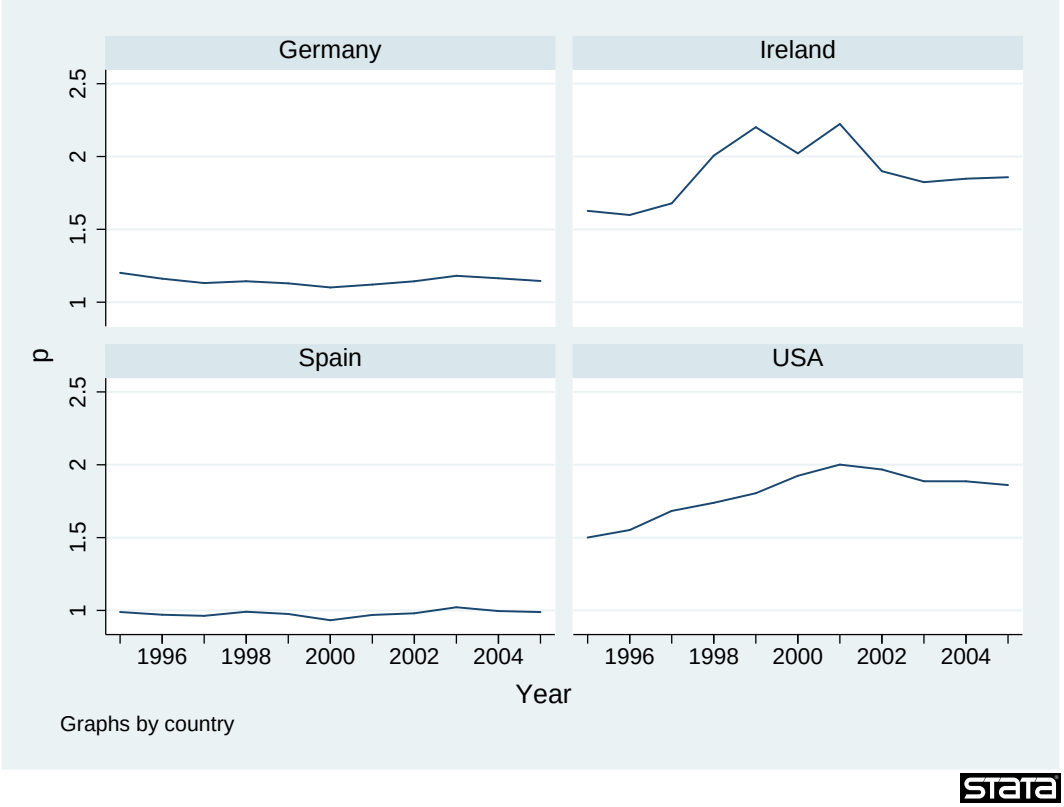

Figure 5: Quantity Component of the Intensive Margin of Exports to the EU for Selected Countries

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