Eastern European Enlargement and the Effects on Traded Variety

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Abstract

The aim of this paper is to analyze the impact of the Eastern European Enlargement on the trade structure between the EU economies. We present intensive and extensive margins for the "new" and "old" member states. The "new" member states experience growth at both, the intensive and extensive margins, before and after the enlargement. The intensive margins of the "old" member states however fall right after the accession of the "new" members: This indicates the increasing importance of these "new" countries in intra European trade. Furthermore, as recent literature has focused on determining the effects on welfare gains for consumers through an increased product variety, we calculate these gains from traded variety for the EU economies before and after the enlargement: The "new" member states have experienced higher gains from variety before and after the enlargement. Virtually all of these gains stem from imports coming from "old" members.

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1 Introduction

With the enlargement of the European Union (EU) in the year 2004, ten new member states simultaneously joined the Union. This paper analyzes the trade structure of the EU before and after the enlargement. Using data from 1999 to 2007, we analyze trade flows beetween and within the "new" and "old" member states. Central parts of the analysis include the extensive and intensive margins of trade as derived by Hummels and Klenow (2005) and the growth in traded variety as well as its effect on consumer's welfare. This welfare gain is computed as in the work of Broda and Weinstein (2006) that is based on the seminal contribution by Feenstra (1994).

Using descriptive statistics we observe that the relative increase in import value and imported variety is higher for the "new" member states. Furthermore, after the enlargement the growth rates have even increased slightly: Especially, the imported variety from the "old" member states surged after the enlargement. The "old" member states on the other hand have experienced a slight and steady increase of imports in value and variety over the whole period.

This is further investigated by calculating the intensive and extensive margins of Hummels and Klenow (2005). The margins grow steadily for the "new" member states over the whole period. Especially the extensive margins of the trade within the "new" member states increased strongly. This indicates the stronger linkages between the "new" member states established during the last few years. For the "old" member states the extensive margins increase only slightly. Additionally, the intensive margins experienced a large fall just after the enlargement. This exemplifies the decreasing importance of the "old" member states in intra EU trade.

To further analyze the effects of the increase in traded variety, we calculate the gains from traded variety as in Broda and Weinstein (2006). As expected, the "new" member countries experience larger gains relative to their GDP before and after the enlargement. Surprisingly however, the gains after the enlargement are a lot smaller for all EU economies. The reason for this result is different for "new" and "old" member states: The "old" member states experienced only small growth in variety after the enlargement. The "new" member states on the other hand have experienced a large increase of the number of imported variety during the whole period. However, the new varieties after the enlargement were only imported at low values. Hence, the welfare effect of these varieties on the consumer has been very limited.

This paper is organized as follows: Section 2 provides a literature review and discusses some empirical results. In Section 3, the data of the 25 EU countries are analyzed using descriptive statistics. Some first observations are discussed. The empirical methods used in this paper are then presented in Section 4. This concerns mainly the intensive and extensive margins of trade as well as the methodology to compute the gains from variety. Section 5 then calculates these margins as well as the gains and discusses the results. Section 6 concludes.

2 Literature Review and Theoretical Background

Although the Eastern European Enlargement in 2004 is supposed to have an impact on the volume and the redirection of trade flows between the "old" and "new" member states, the analysis of detailed trade flows, and even more so, the impact on consumer welfare and on the structure of trade has received little attention in the empirical trade literature so far. Funke and Ruhwedel (2005) provide an empirical analysis of detailed trade data on export variety and economic growth in Eastern European Countries and find a strong link between product variety and growth. In contrast to our study they focus on the production side and the impact of product variety on productivity.

Hoekman and Djankov (1997) and Aturupane and Hoekman (1999) show in two pre Eastern enlargement studies how trade flows and especially the export structure of Central and Eastern European countries with the European Union has changed over time and analyze the link between different country endowments and intra-industry trade. In another pre Eastern enlargement analysis, Buch and Piazolo (2001) estimate the future impact of the Eastern enlargement at an aggregate level on trade and capital flows and conclude that the enlargement will further boost trade and capital flows for all EU candidates, with a minor effect for the Czech Republic, Hungary, and Poland.

This paper is further related to two strands in the trade literature, which have received substantial attention more recently. In the empirical literature several studies have tried to evaluate the effects of new varieties on consumer welfare and the role of trade. A first attempt was made by Romer (1994). He shows in an numerical example that due to existing fixed exports cost a reduction of trade barriers will lead to more exported varieties resulting in an increase of GDP of up to 20%. Using a similar approach, Klenow and Rodriguez-Clare (1997) construct and calibrate a general equilibrium model using detailed Costa Rican trade data to quantify the impact of trade restrictions on welfare. Their results suggest that the gains from trade liberalization can be much higher compared to traditional models if the effects on traded variety are taken into account.

These approaches are based on the theory first outlined by Spence (1976) and Dixit and Stiglitz (1977), and extended to trade by Krugman (1980).[1] Based on a monopolistic competition model, where one good is available in different varieties, each produced by a single firm, trade leads to an increased number of varieties available for consumers. In combination with a constant elasticity of substitution (CES) utility function consumers gain welfare via the consumption of more varieties. In these models the elasticity of substitutions between different varieties determines the overall impact of new varieties on consumer welfare. Based on this theory, Feenstra (1994) develops an artificial price index to empirically assess the impact of new and disappearing varieties for a single imported good. New varieties lower the index of a single imported good and disappearing varieties increase the index, where the magnitude depends on the substituability and expenditure share of a variety. Broda and Weinstein (2006) extend the approach of Feenstra (1994) by constructing an aggregate

[1] A modern approach to model fixed export costs and their consequences on traded variety which is also based on the Krugman models would for example be Melitz (2003).

price index which allows to incorporate many products and hence allows them to compute the overall impact of traded varieties on consumer welfare for the United States for the period from 1972 to 2001 using highly disaggregated trade data. They find an upward bias of the conventional price index of 1.2 percent per year, which translates into an overall positive effect of 2.6 % of the GDP for this period due to the increase in traded variety.

A second strand of related literature treats the intensive and extensive margins of trade: In the trade literature, different types of trade models can be identified. While virtually every theory predicts more exports and imports after trade liberalization, trade theories differ in their predictions of the intensive and extensive margins of trade. Models in the vein of Armington (1969) emphasize the intensive margin, where trade liberalization increases the trade volume of the same good, but does not increase the number of traded varieties. On the other hand, New Trade Theory models stress the extensive margins, where trade liberalization increases the number of traded varieties. Finally, vertically differentiation models include a quality margin, and accentuate that richer countries export higher quality goods (see Flam and Helpman (1987) and Grossman and Helpman (1991)).

Hummels and Klenow (2005) derive an expression for the extensive and intensive margins of trade based on Feenstra (1994). They are able to convincingly quantify the extensive and intensive margins of trade empirically. Furthermore, they decompose the intensive margin into a quantity and a price component. This allows them to identify a quality component of trade that explains why larger and richer countries export higher priced goods.

Regarding trade liberalization and its effect on variety, some articles in the empirical literature have analyzed the composition of trade flows and the impact of trade liberalization for the United States: Following Hummels and Klenow (2005), Russell and McDaniel (2003) decompose disaggregated trade data for the U.S. with its NAFTA trade partners to compare the nature of U.S. trade growth with Canada and Mexico relative to non-NAFTA partners. Their results provide evidence that variety growth after the implementation of the NAFTA has played an important role for trade growth. Debaere and Mostashari (2005) use U.S. bilateral trade and tariff data between 1989 to 1999 to study the effect of a tariff reduction on the extensive margin. They find that changing tariffs influence the extensive margin, in a way that tariff reductions of the U.S causes trade of new products.

3 Descriptive Statistics

In this section we briefly describe our dataset and show some summary statistics of trade flows between "old"" and "new" member states. Our description of the data and also the way we proceed in the empirical section is as follows. We consider the trade between and within two blocks: The old ("EU-15") and the new ("EU-10") member states. For example, if we consider the exports within EU-15, we add up the exports of each member state to all the other EU-15 member states to get an aggregate value.

The database used stems from Eurostat and consists of highly disaggregated trade data for the EU-25 countries at the HTS-8 level which defines over 8'000 product categories and covers the period from 1999 to 2007. We employ quarterly data and collect import and export data for each individual EU-25 country for all trade partners within the European Union. Due to potential inconsistencies between import and export trade data, we solely rely on export data for both, the new and old member states. For example, we use export data of the EU-15 to the EU-10 as imports of the EU-10 from the EU-15.

In this section we show descriptive statistics about the trade flows, the number of traded variety and the average value per variety to get a first picture of the trade structure in Europe. Although the accession of the Eastern countries in the second quarter of 2004 also affected other parts of the economy, the impact on trade flows has been remarkable: Figure 1 shows the extent of the increase of total trade flows between and within the two blocks. Trade flows within the EU-15 can be seen as a benchmark since those countries have been part of the European Union in both periods.[2]

While trade flows within the EU-15 have increased at relative modest rates before and after the accession of the "new" member states, trade flows with and within the EU-10 experienced a larger growth rate over the whole period and the difference is even larger after the enlargement. Especially trade flows within the EU-10 have already increased by 100 percent in the pre enlargement period, but the (nominal) volume has more than tripled in the second half of our sample. We obtain similar results for the import flows of the EU-15 from the EU-10 and of the EU-10 from EU-15. Although these flows have not grown at such high rates, their growth in terms of absolute values is much higher since the trade flows are higher in magnitude: Trade within the EU-10 has increased from around 2.7 billion in the first quarter to 16.2 billion in the last quarter, while imports of the EU-10 from the EU-15 have grown from 18.7 billion to 55.2 billion. Imports from the EU-15 from the EU-10 have increased from 15.7 to 54.3 Billion. [3]

Next, we decompose our data into the number of traded varieties and the average value per variety to get a first impression what caused the surge in trade flows. For our analysis we define a good to

[2]So far we use nominal data, which may overstate the overall effect. But this should be only a minor problem: Inflation rates do not differ too much between the blocks and the periods and thus the relative picture stays the same qualitatively.

[3]See Tables 1 to 4 to get a more complete picture.

be a category of the 8-digit Harmonized Tariff System (HTS), and as mentioned previously, a variety is defined as the import of a particular good from a particular country. Figure 2 gives an overview of traded varieties between and within blocks. Again, changes within the EU-15 have been modest and there seems to be no structural difference before and after the enlargement. For the imports of the EU-10 from the EU-15 we can see two effects. First, there is a sudden increase in the number of traded varieties after the enlargement. Secondly, the growth rate of traded varieties also slightly increases with the accession of the "new" member states. For the imports within the EU-10 the transition seems to be smoother and it is not so clear if there is an effect on the number of traded varieties from a first view. However, the growth rate of the number of varieties is high during the whole period of 1999 to 2007.

For the imports of the EU-15 from the EU-10 no big impact on traded variety can be seen directly after the enlargement. In contrast, we can see a stagnation and a decrease of the number of imported varieties for some periods after the enlargement, which is also observable for the intra EU-10 imports but there it is compensated by the generally high growth. This effect is a bit of puzzle so far and may be an indicator for data difficulties.[4]

Figure 3 shows the development of the average value per variety for each trade flow. Once more, the within imports of the EU-15 show no significant difference before and after the enlargement, contrary to the EU-10 imports. Here we can see a strong increase in both periods, with an even higher growth rate in the second period. For the imports of the "old" member states from the "new" member states, the average value increases in the second period.

Finally, the average value of the imports of the EU-10 from the EU-15 seem to stagnate if not decrease shortly after the enlargement. More recently however, the average value has started to increase at higher rates. This issue with the seemingly lower average values that are accompagnied by the dramatic increase in the number of varieties as seen in Figure 2 must be further explored. One could assume that this dramatic increase of the variety of EU-10 imports from EU-15 may be a consequence of some redefinition of the traded goods.[5]

However, as Table 1 shows, the number of goods imported by EU-10 from EU-15 evolves smoothly: From 1999 to 2004, the number increased from roughly 37'000 to 40'000 and from 2004 to 2007 it increased from 40'000 to 43'000. Nevertheless, the average number of supplying countries increased greatly especially in the second period from 3.42 to 4.27. This increase is responsible for most of the large variety increase from 156'000 to 207'000 after the enlargement that is displayed in Figure 2.

Thus, it really seems to be the case that after the enlargement, the new member countries started

[4]Note that the two time series that may have problems are constructed using export data from the Eastern European countries. These data may be of lower quality.

[5]Such redefinitions of the HTS-classification happen regularly. This would pose a problem since such a redefinition may artificially increase the number of goods and the resulting increase in the variety would not be a "true" increase. Nevertheless, we could not find hints for such effects in the official "international trade statistics - methodologies and classification" from Eurostat.

importing from more and more old member states. Simultaneously, the average value per variety decreased slightly (as shown in Figure 3). That is, the new member states imported the goods from more countries but at lower value per variety just after the enlargement. More recently, the average values "catched up".

Table 1 reveals some other interesting results on the dynamics of imports between these two blocks: From rows one and two of the first panel we can see that the number of traded varieties has increased greatly from 133'744 in the first quarter to 207'638 in the last quarter. Secondly, this increase is the result of both, an increase of the number of traded goods and an increase in the number of trading partners. From rows three to six we can deduce that both effects approximately account for half of the increases in traded varieties over the whole period. If the set of traded good is held constant the number of varieties increase from 114'145 to 164'145 (rows three and four). The number of newly traded goods accounts for 43'493 new varieties while the disappearing goods account for a minus of 19'003 varieties.

The new varieties account for 17% of total value in 2007, with an average value per variety of 211'000 Euro as is displayed in columns four and five. If we separate the sample in our two periods we find that the share of new varieties on the total value in the second period has only slightly increased from 0.09 to 0.10, but the number of newly traded varieties has increased by 50% from 19.866 to 29.161 in the second period.

Table 2 shows these statistics for the within trade of EU-10. The number of varieties increases more smoothly over the whole period at higher rates compared to the other trade flows. Similar to the import trade flows of the EU-15 from the EU-10 the increase in the number of traded varieties is half to the trade of new products (9'363), and half to common products traded with new partners, where the average of trading partners increases from 2,28 to 3,15. Again the share of new varieties accounts for approximately one fifth of total imports (22%). For the two subperiods we do not find considerable differences for the number of traded varieties. Nevertheless, the increase of the average value per variety in the second period seems to be higher.

For the imports of the "old" member states from the "new" member states the results differ in some points as Table 3 shows. First, the increase of new varieties is smaller. Secondly, the increase in the first period is higher compared to the second period, which is in contrast to what one may expect. This effect can be assigned to the stagnation of the number traded goods, as displayed in rows five and six of the third panel. Despite the stagnation of traded varieties the share of newly traded varieties accounts for 17% in the second period compared to 7% in the first period. This can be explained by a dramatic increase of the average value of newly traded varieties from 170'000 Euro to 767'000 Euro.

Table 4 displays these numbers for the intra EU-15 imports. As seen in the figures, the increases in variety, number of goods and average value are small but steady and in line what one can see from the graphs and there is no considerable difference between the two subperiods.

These first results can be interpreted as follows. With the Eastern Enlargement, "new" member states started to import more varieties and diversified their consumption. Importantly, these countries import more in value and variety from EU-15 and other EU-10 countries. The old member states however do not experience such an increase, neither in trade with other EU-15 economies, nor with the EU-10. Thus, for the empirical section we would expect larger changes in the intensive and extensive margins of the EU-10 countries. Also, the gains from variety are expected to be higher for those countries. Note however that in this section we have looked at "rough" descriptive statistics as for example the number of varieties. The methods used in the empirical section below are more elaborate. They are presented in the next section.

4 Empirical Strategy

In this section we briefly review the two methodologies developed by Hummels and Klenow (2005) and by Feenstra (1994) and Broda and Weinstein (2006) which we will use to analyze the impact and the composition of trade flows.

4.1 The Gains from Variety

4.1.1 Utility Model and Price Index

We follow Feenstra (1994) to derive an exact price index for a CES utility function of a single good with a constant number of varieties. This index is then extended by allowing for new and disappearing varieties. Finally, we show how to construct a aggregate import price index based on the contribution of Broda and Weinstein (2006).

We start with a simple CES utility function with the following functional form for a single imported good. To define a variety of a good we assume that imports of one good g are treated as differentiated across countries of supply, c:

$$M_{g,t} = \left(\sum_{c \in C} d_{g,c,t} M_{g,c,t}^{1-\sigma_g} \right)^{\frac{1}{(1-\sigma_g)}} ; \sigma_g > 1, \tag{1}$$

where C denotes the set of available countries and hence potentially available varieties in period t. $M_{g,c,t}$ is the subutility derived from the imported variety c of good g in period t and $d_{g,c,t} > 0$ is the corresponding taste or quality parameter. The elasticity of substitution among varieties is given by σ_g and is assumed to be larger than one.

Using standard cost minimization gives us the minimum unit-cost function.

$$\phi_{g,t}(I_{g,t}, \vec{d}_{g,t}) = \left(\sum_{c \in I_{g,t}} d_{g,c,t} (p_{g,c,t})^{1-\sigma_g} \right)^{\frac{1}{1-\sigma_g}} \tag{2}$$

where $p_{g,c,t}$ is the price of variety c of good g in period t and $\vec{d}_{c,t}$ is the vector of taste or quality parameters. $I_{g,t} \subset C$ is the subset of varieties of good g imported at time t.

Suppose the set of available product varieties $I_{g,t}$ in period t and $t-1$ is identical, the taste parameters $\vec{d}_{c,t}$ are also constant over time and $\vec{x}_t$ and $\vec{x}_{t-1}$ are the cost-minimizing consumption bundle vectors for the varieties of one good for given the price vectors. In this case Diewert (1976) defines an exact price index as a ratio of the minimum cost functions

$$P_g(\vec{p}_{g,t}, \vec{p}_{g,t-1}, \vec{x}_{g,t}, \vec{x}_{g,t-1}, I_g) = \frac{\phi_{g,t}(I_g, \vec{d}_g)}{\phi_{g,t-1}(I_g, \vec{d}_g)} \tag{3}$$

where the price index does not depend on the unknown taste parameters $\vec{d}_{c,t}$.

Sato (1976) and Vartia (1976) have derived the exact price index for our CES unit-cost function. It can be written as the geometric mean of the individual price changes

$$P_g(\vec{p}_{g,t}, \vec{p}_{g,t-1}, \vec{x}_{g,t}, \vec{x}_{g,t-1}, I_g) = \prod_{c \in I_g} \left(\frac{p_{g,c,t}}{p_{g,c,t-1}} \right)^{w_{g,c,t}} \tag{4}$$

where the weights are calculated using the expenditure shares in the two periods:

$$w_{g,c,t} = \frac{\left(\frac{s_{g,c,t} - s_{g,c,t-1}}{\ln s_{g,c,t} - \ln s_{g,c,t-1}} \right)}{\sum_{c \epsilon I_g} \left(\frac{s_{g,c,t} - s_{g,c,t-1}}{\ln s_{g,c,t} - \ln s_{g,c,t-1}} \right)}$$

$$s_{g,c,t} = \frac{p_{g,c,t} x_{g,c,t}}{\sum_{c \epsilon I_g} p_{g,c,t} x_{g,c,t}}$$

So far we have assumed that all varieties of one good are available in both periods to calculate the exact price index. As our data also include new and disappearing varieties we use the price index developed by Feenstra (1994) which allows to incorporate new and disappearing product varieties given by the following proposition.

Proposition: For every good g, if $d_{g,c,t} = d_{g,c,t-1}$ for $c \in I_g = ((I_{g,t} \cap C_{g,t-1}); \quad I_G \neq \emptyset$, then the exact price index for good g with change in varieties is given by

$$\Pi_g(\vec{p}_{g,t}, \vec{p}_{g,t-1}, \vec{x}_{g,t}, \vec{x}_{g,t-1}, I_g) = \frac{\phi_{g,t}(I_{g,t}, \vec{d_g})}{\phi_{g,t}(I_{g,t-1}, \vec{d_g})} \tag{5}$$

$$= P_g(\vec{p}_{g,t}, \vec{p}_{g,t-1}, \vec{x}_{g,t}, \vec{x}_{g,t-1}, I_g) \left(\frac{\lambda_{g,t}}{\lambda_{g,t-1}} \right)^{\frac{1}{\sigma_g - 1}}, \tag{6}$$

where

$$\lambda_{g,r} = \frac{\sum_{c \epsilon I_g} p_{g,c,r} x_{g,c,r}}{\sum_{c \epsilon I_{g,r}} p_{g,c,r} x_{g,c,r}} \; ; \; r = t, t-1.$$

The idea of the Feenstra (1994) index is to correct the conventional price index P_g by multiplying it with an additional term which measures the influence of new and disappearing varieties and is called the lambda or Feenstra ratio. I $r = t$, the numerator of this term quantifies the impact of newly available varieties as $\lambda_{g,t}$ is the ratio of expenditures on varieties available in both periods relative to the entire set of varieties available in period t. Hence, $\lambda_{g,t}$ decreases when new varieties appear and so does the price index. On the other hand the denominator of the lambda ratio captures the impact of disappearing varieties. They lower $\lambda_{g,t-1}$ and the index is increased.

Secondly, the exact price index depends on the elasticity of substitution between varieties. If we observe a high elasticity of substitution, the additional term $(\frac{\lambda_t}{\lambda_t - 1})^{\frac{1}{\sigma - 1}}$ will approach unity and the influence on the price index is small. From an economic point of view this is intuitive, since new and disappearing products will only have a minor influence on the welfare of consumers if there exist close substitutes, i.e. if the varieties are homogeneous.

Having derived the exact price index for one good, we can now aggregate the imported goods to an aggregate import price index as in Broda and Weinstein (2006). This is done by building a geometric mean of the price indices. The aggregate import price index is then given by

$$\Pi(\vec{p}_t, \vec{p}_{t-1}, \vec{x}_t, \vec{x}_{t-1}, I) = \left[P_g(.) \prod_{g \in G} \left(\frac{\lambda_{g,t}}{\lambda_{g,t-1}} \right)^{(1/\sigma_g - 1)} \right]^{w_{g,t}}, \tag{7}$$

$$= CIPI(I) \prod_{g \in G} \left(\frac{\lambda_{g,t}}{\lambda_{g,t-1}} \right)^{w_{g,t}/(\sigma_g - 1)}, \tag{8}$$

where the weights $w_{g,t}$ are defined as above.

Equation (8) shows that the aggregate exact import price index is the product of a conventional import price index, $CIPI(I)$, and the aggregated lambda ratios. Consequently, the following measure, called endpoint ratio (EPR) can be used as an indicator of the upward bias of a conventional price index compared to the corrected price index. It is the ratio of the corrected import price index and the conventional import price index:

$$EPR = \frac{\Pi^M}{CIPI(I)} = \prod_g \left(\frac{\lambda_{gt}}{\lambda_{gt-1}} \right)^{w_{gt}/(\sigma_g - 1)}. \tag{9}$$

Using a simple Krugman (1980) structure of the economy, the inverse of the endpoint ratio can be weighted by the share of imports on the GDP to get the gains from variety:

$$GFV = \left[\frac{1}{EPR} \right]^{w_t^M} - 1 = \left[\prod_g \left(\frac{\lambda_{gt}}{\lambda_{gt-1}} \right)^{-w_{gt}/(\sigma_g - 1)} \right]^{w_t^M} - 1, \tag{10}$$

where w_t^M is the import share.

4.1.2 Stochastic Specification

In order to compute the exact import price index we have to estimate the elasticity of substitution between varieties of each good. Therefore we briefly review the estimator developed by Feenstra (1994) and extended by Broda and Weinstein (2006). Given our utility function (1), we can derive the import demand equation for a single variety using expenditure shares s as defined above.[6] Taking logs and first differences results in:

$$\Delta \ln s_{g,c,t} = \varphi_{g,t} - (\sigma_g - 1) \Delta \ln p_{g,c,t} + \varepsilon_{g,c,t}, \tag{11}$$

where σ_g is equal across countries, $\varphi_{g,t} = (\sigma_g - 1) \ln[\phi g, t^M(d_t)/\phi^M_{g,t-1}(d_{t-1})]$ is a random effect since d_t is unobserved and $\varepsilon_{g,c,t} = \Delta \ln\ d_{g,c,t}$. The export supply equation in logs and first differences is specified by

[6] Using shares helps to avoid the problems of measurement error of unit-value indices as pointed out by Kemp (1962)

$$\Delta \ln p_{g,c,t} = \psi_{g,t} + \frac{\omega_g}{1+\omega_g} \Delta \ln s_{g,c,t} + \delta_{g,c,t}. \tag{12}$$

where $\omega_g \geq 0$ is the good specific inverse supply elasticity[7] (assumed to be constant across countries) and $\delta_{g,c,t}$ is an error term.

To identify the elasticity of substitution we have to assume that the the error terms between the demand and supply curve $(\varepsilon_{g,c,t}, \delta_{g,c,t})$ are uncorrelated after controlling for good and time specific effects. To take advantage of this assumption we first eliminate the random terms $\varphi_{g,t}$ and $\psi_{g,t}$ from equations (11) and (12) by taking differences relative to a reference country k:

$$\Delta^k e_{g,c,t} = -(\sigma_g - 1)\Delta^k ln\ p_{g,c,t} + \varepsilon^k_{g,c,t} \tag{13}$$

$$\Delta^k \ln p_{g,c,t} = \frac{\omega_g}{1+\omega_g} \Delta^k \ln s_{g,c,t} + \delta^k_{g,c,t}, \tag{14}$$

where $\Delta^k K_{g,c,t} = \Delta K_{g,c,t} - \Delta K_{g,k,t}\ for\ K = (\ln p, \ln s)$, $\varepsilon^r_{g,c,t} = \varepsilon_{g,c,t} - \varepsilon_{g,r,t}$ and $\delta^r_{g,c,t} = \delta_{g,c,t} - \delta_{g,r,t}$. We can now use the assumption of the independent error terms to multiply (13) and (14) and dividing by $(1-\rho_g)(\sigma_g - 1)$ to obtain

$$\left(\Delta^k \ln p_{g,c,t}\right)^2 = \theta_{1,g} \left(\Delta^k \ln s_{g,c,t}\right)^2 + \theta_{2,g} \left(\Delta^k \ln p_{g,c,t} \Delta^k \ln s_{g,c,t}\right) + u_{g,c,t} \ \text{ or} \tag{15}$$

$$Y_{g,c,t} = \theta_{1,g} X_{1,g,c,t} + \theta_{2,g} X_{2,g,c,t} + u_{g,c,t}, \tag{16}$$

with obvious definitions of $\theta_{1,g}$ and $\theta_{2,g}$. Since the error term $u_{g,c,t}$ is correlated with the prices and expenditure shares in $X_{1,g,c,t}$ and $X_{2,g,c,t}$, we do not get a consistent estimator for $\theta_{1,g}$ and $\theta_{2,g}$. However, Feenstra (1994) shows how to exploit the panel structure of the data to get a consistent estimator by averaging (16) over all t. Hence, we can use the GMM estimator developed by Hansen (1982) to run a regression on the transformed equation of (16) to estimate $\theta_{1,g}$ and $\theta_{2,g}$ consistently.

$$\overline{Y}_{g,c,t} = \theta_{1,g} \overline{X}_{1,g,c,t} + \theta_{2,g} \overline{X}_{2,g,c,t} + \overline{u}_{g,c,t} \tag{17}$$

where upper bars on variables denote sample means over t.[8] Once, we have consistent estimators of $\theta_{1,g}$ and $\theta_{2,g}$ we can calculate the elasticity of substitution σ_g:

[7] If $\omega_g = 0$ we get the special case of a horizontal supply curve

[8] Feenstra (1994) points out that $\theta_{1,g}$ and $\theta_{2,g}$ can not be estimated separately if the two vectors X_1 and X_2 are proportional. Hence, the following identification condition must hold

$$\left(\frac{\sigma^2_{\epsilon,c} + \sigma^2_{\epsilon,r}}{\sigma^2_{\epsilon,j} + \sigma^2_{\epsilon,r}}\right) \neq \left(\frac{\sigma^2_{\delta,c} + \sigma^2_{\delta,r}}{\sigma^2_{\delta,j} + \sigma^2_{\delta,r}}\right) \tag{18}$$

where c,r and j denote different countries. In words, there must be some differences in the relative variances of the demand and supply curves across countries.

As long as $\theta_{1,g} > 0$, σ_g can be estimated as

$$\begin{aligned} &\text{a) if} \quad \widehat{\theta}_{2,g} > 0 \quad \text{then} \quad \widehat{\rho}_g = \tfrac{1}{2} + \left(\tfrac{1}{4} - \tfrac{1}{4(\widehat{\theta}^2_{2,g}/\widehat{\theta}_{1,g})} \right)^{1/2}, \\ &\text{b) if} \quad \widehat{\theta}_{2,g} < 0 \quad \text{then} \quad \widehat{\rho}_g = \tfrac{1}{2} - \left(\tfrac{1}{4} - \tfrac{1}{4(\widehat{\theta}^2_{2,g}/\widehat{\theta}_{1,g})} \right)^{1/2}, \end{aligned}$$

and in either case,

$$\widehat{\sigma}_g = 1 + \left(\frac{2\widehat{\rho}_g - 1}{1 - \widehat{p}_g} \right) \frac{1}{\widehat{\theta}_{g2}}. \tag{19}$$

The solutions are not unique and can be imaginary. In the case of non-uniqueness we set constraints on the values, as σ_g has to exceed unity by assumption. If $\theta_{1,g} > 0$, then $\sigma < 0$. In that case Broda and Weinstein (2006) perform a grid search over the set of plausible parameter values for σ_g.

4.2 Intensive and Extensive Margins

4.2.1 Decomposing the Trade Flows

Secondly, we focus on the intensive and extensive margin to answer the question whether our set of countries exports more of one product category (intensive margin) or a larger set of product varieties (extensive margin) and how the composition has changed over time.[9] We follow the approach of Hummels and Klenow (2005) to calculate the the intensive and extensive margins and to decompose the intensive margin into price and quantity components.

Suppose, there is one exporting country e, a set of reference countries r (in our empirical analysis, r will be the rest-of-europe) and the corresponding importing country m. Then the extensive margin using goods categories of country e can be defined as

$$EM_{e,m} = \frac{\sum_{i \epsilon I_{e,m}} p_{r,m,i} x_{r,m,i}}{\sum_{i \epsilon I} p_{r,m,i} x_{r,m,i}} \tag{20}$$

where I is the total set of product categories and I_{em} is the set of observable categories in which country e has positive exports to country m ($x_{e,m,i} > 0$). The extensive margin for country e is the fraction of *European exports* exports to country m in the product categories where e has positive exports to m relative to total *European exports* to country m.

For the equivalent intensive margin for country e we can use the corresponding expression given by

$$IM_{e,m} = \frac{\sum_{i \epsilon I_{e,m}} p_{e,m,i} x_{e,m,i}}{\sum_{i \epsilon I_{e,m}} p_{r,m,i} x_{r,m,i}} \tag{21}$$

The intensive margin can be thought of as the share of a country's exports relative to total *European exports* in those product categories in which e exports to m ($I_{j,m}$). If country e concentrates

[9] Remember from section 3, that we use bilateral export flows as import flows in our empirical analysis.

all of its exports in a small number of product categories it will have a relatively high intensive and a low extensive margin. Contrary, the intensive margin will be relatively low and the extensive margin will be high if a country spreads its exports thinly over many product categories.

Next, Hummels and Klenow (2005) decompose the intensive margin into a price and a quantity index.

$$IM_{e,m} = P_{e,m}X_{e,m} \tag{22}$$

Again, we can follow Feenstra (1994) and use equation (4) to derive an exact price index for the intensive margin of country m's imports from e relative to r:

$$P_{em} = \prod_{i \epsilon I_{e,m}} \left(\frac{p_{e,m,i}}{p_{r,m,i}} \right)^{w_{e,m,i}} \tag{23}$$

where, $w_{e,m,i}$ is now the logarithmic mean of $s_{e,m,i}$, the share of category i in country e's exports to m.[10] This decomposition allows us to measure the quantity and price components of the intensive margin.

4.2.2 Quality Differentiation

These ingredients will also allow us to measure a quality component as in Hummels and Klenow (2005). The authors find empirically that larger and richer economies do export their varieties at higher prices, contrary to what standard trade models would predict. This can be explained by quality differentiation: Richer countries can export their goods at higher prices due to the higher quality content.

Hummels and Klenow (2005) extract the quality component from the price and quantity components derived above. If the true number of varieties per good were known, we could use the following equation from Flam and Helpman (1987) to get the quality component of the exports of country j:

$$\ln(Q_j) + \frac{1}{\sigma}\ln(N_j) = \ln(p_j) + \frac{1}{\sigma}\ln(N_j x_j), \tag{24}$$

where Q_j is the quality component of country j, σ is the elasticity of substitution, N_j is the number of true varieties and x_j is their value. Without the information about the true number of within-category varieties, this calculation can only be done using an additional assumption. It is assumed that the within-category variety does not vary with the size or the wealth of a country. Then, the above equation is simplified, and the quality components can be calculated:

$$\ln(Q_j) + \frac{1}{\sigma}\ln(N) = \ln(p_j) + \frac{1}{\sigma}\ln[N x_j]. \tag{25}$$

[10] $X_{e,m}$ is given implicitly by (22) and (23)

5 Empirical Results

In this section we report the results from our estimations. In the first part, we calculate the intensive and extensive margins. Note that the quality margins are not yet included in this early version of the paper. In the second part, the gains from variety are estimated for each of the 25 member countries.

5.1 Intensive and Extensive Margins

Following our descriptive analysis of trade flows in section 3, we calculate the margins for each import flow between and within the two blocks for each quarter. This allows us to analyze how the structure of trade has changed over time. Again, one can think of the EU-15 to EU-15 trade flow as a benchmark for our analysis. In a first step we compute the intensive and extensive margins of imports for each country. Then we take the sample average of these margins for each block.[11] For example, to calculate the extensive margin of the EU-10 imports from the EU-15, we compute the extensive margin of imports for each single EU-15 member state and then take the sample average of these margins across all countries.

The calculation of the extensive margins reveal some interesting points. First, from Figure 4 we can see that the extensive margin of EU-10 imports from the EU-15 and the EU-10 both increase for the overall period, with a relatively high growth rate for the EU-10 and a smaller one for the EU-15 imports. Using the margins by Hummels and Klenow (2005), this can be interpreted as follows: The EU-10 countries import on average around 80% of all products existing in the whole EU (weighted by the value) from EU-15 countries. From other EU-10 countries they imported about 55% in the year 1999 and about 70% in the year 2007. Thus, a kind of a catch-up effect takes place here: While a few years ago, the EU-10 countries imported a large fraction of all products from the EU-15 but not from the EU-10, this is about to change.

Figure 5 displays the extensive margins of EU-15 imports from EU-10 and EU-15. Compared to the margins of the EU-10, the picture is quite different. The extensive margins of imports from other EU-15 countries do not experience a large increases during the whole period. This is due to the fact that EU-15 countries already imported most of all available varieties in 1999. Thus, it is difficult to increase this share which is at about 90% even further. The margins of imports from EU-10 countries on the other hand are on a slightly higher level after the enlargement, but remain pretty stable therafter. One may have expected that these margins of inter block trade may also increase. One reason why this is not the case may be that the EU-10 countries themselves imported more and more varieties. Thus, for the extensive margin of EU-15 imports from EU-10 countries to increase, the variety increase must overcompensate this general increase in traded variety: Using the approach of Hummels and Klenow (2005), the extensive margin is always relative to the total set of goods traded.

[11] Note that we use the unweighted average, i.e. we do not weight the margins according to the trade volume.

Turning to the intensive margins, Figure 6 shows the results for the EU-10 imports from EU-15 and EU-10. The intensive margins of the EU-10 grow with a constant rate for the overall period. Consequently, there seems to be no significant effect after the transition. This may be explained by our method of calculating the margins. The intensive margin is the fraction of the total value a country imports relative to the total value of imports all countries within the product categories that are imported by the country. With the enlargement, all member states imported more values and thus this "market share"[12] stayed relatively constant. Nonetheless, the slight increase of the intensive margin indicates that the EU-10 countries increased their relevance in EU-trade also in terms of traded values. Furthermore, it is interesting that the intensive margins for imports from EU-10 are higher than the ones for imports from EU-15. This indicates that the EU-10 have a higher "market share" in those product categories which are traded with the other EU-10 member states.

Figure 7 displays the results for EU-15 imports from EU-10 and EU-15. The sudden drop of the intensive margin of EU-15 imports in 2004 catches the eye. Again, this can be explained by keeping in mind the definition of the intensive margins: After the enlargement the same product categories have been traded by more countries, especially by the new member states, hence reducing the share of a single country's trade in this product categories. Note that before the the expansion, the intensive margin of imports from EU-10 were slightly higher than of imports from EU-15. After the enlargement this is just reversed. This may be due to large increase of the within trade of the EU-10 economies after 2004.[13]

The intensive and extensive margins support the first impressions obtained using descriptive statistics: the "new" member states experienced more growth in imported value and variety compared to the "old" member states. This is true for imports from EU-10 as well as for imports from EU-15. The extensive margins of EU-15 stayed roughly constant while the intensive margins even decreased over time. This indicates the decreasing importance of the "old" member states in intra European trade. In the next section the trade structure is analyzed from yet a different angle: The gains from variety for each of these two blocks are calculated. From the evidence given so far, we expect the EU-10 countries to profit relatively more from the newly imported variety.

5.2 Gains from Traded Variety

We estimate the bias of the import price index resulting from intra EU trade as described in Section 4 above for the 25 EU countries. The bias is estimated annually:[14] Table 5 shows the results. As

[12] The term "market share" is put between quotation marks: It is not really a share since adding up all intensive margins will not result in a value of one because the share is always computed using only this product set that is imported by the particular country. Nonetheless, intuitively this measure expresses the share that a country has in its traded goods relative to the other countries.

[13] And as noted above, the curve "EU-15 Imports from EU-10" may again exhibit some data problems.

[14] As mentioned in Section 4, the bias is connected to the endpoint ratio (EPR) derived in equation (9). It is calculated as $Bias = 1 - EPR$.

an example, consider the value of 0.09% for France in the year 1999. It means that the conventional import price index of France that does not account for the increase (or decrease) in variety is biased upwards by 0.09% in the year 1999. In other words, the import price index is lowered through the import of new varieties. The last three columns of Table 5 then show the aggregate bias over the whole periode of 1999 to 2007, and the two periods before and after the enlargement: From 1999 to the first quarter of 2004 and from the second quarter of 2004 to the end of 2007. Note that most countries experience a positive upward bias of the import price index during the whole period. However, there are some with a negative overall bias, namely France, the Netherlands, Spain, Estonia and Lithuania.

Surprisingly enough, the gains tend to be lower (i.e. negative) in later years. In 2006 and 2007 nearly every country experiences a negative bias. This seems surprising considering all the results that have been discussed so far. To explore this issue a little bit further, the import price index biases of the EU-15 and the EU-10 blocks are presented in Table 6.[15] The biases are much larger in the first period before the enlargement of the EU. Furthermore, the bias is larger in the EU-10 countries with a weighted average of 0.59% compared to 0.30% in the EU-15 countries. This is expected, the descriptive statistic and the margin have already hinted at such a result. In the post enlargement period, the bias is also larger in the EU-10 countries, although very small with 0.04%. The EU-15 countries have even experienced a negative bias on average during this period.

For the EU-15 countries this reflects partly the numbers in Tables 3 and 4 as well as the intensive margins: The increase in variety really was lower in the second period. Also, the overall trade values did not grow a lot. For the EU-10 countries, the seemingly paradoxical result can also be explained: Table 1 for example shows that the new varieties imported during the period of 2004 to 2007 exhibit lower average values than the disappearing varieties. Thus, the varieties that disappeared were more important because they were imported at higher values than the new varieties. Of course, the total value of new varieties is still higher with 5'374 billions compared to the 3'430 billions of the disappearing varieties, but the difference of these numbers is pretty small. Furthermore note that the increase in the variety and value of intra EU-10 trade seems to be large. However, the total magnitude of this trade is still relatively small as Table 2 displays.

These results carry over if the gains from variety are calculated by weighting the bias by the import share as in equation (10). The results discussed above are even a bit more accentuated: The average gains from variety in the EU-10 countries amount to 0.24% of the GDP, a value that is almost four times higher than that of the EU-15 countries with 0.07%. Again, the gains are much higher in the first period. After the enlargement they are virtually zero for the EU-15 countries[16] and also

[15] The biases of the two blocks are calculated by building a weighted average of the bias of the member countries. The GDP is used as weight.

[16] Note that they are close to zero but positive. This is perfectly possible even if though the bias in Table 6 is negative: Every country has a different import share, consequently the countries with the higher import shares get a higher weight when calculating the average gains from variety.

very small for the EU-10 economies.

In a next step, the gains from variety for both, EU-10 and EU-15, are splitted up to assess the contribution to these gains of the two blocks. With other words, Table 8 shows the gains stemming from the two different blocks: For example, in the first row and the first column of the table, we see that the average bias in the EU-15 stemming from EU-15 imports is 0.32%. Considering the bias in the EU-15 countries stemming from EU-10 imports, we get a very small and negative bias of -0.2%. The pattern is similar for the other periods: The import price index bias (and thus also the gains from variety) for both, the EU-15 and the EU-10 stem only from imports from the "old" member states. Imports from the EU-10 contribute slightly negatively to the gains over the whole period. This result is mainly due to the far lower values that all EU countries import from EU-10 countries. This has already been shown in Tables 1 to 4. Thus, consumers in the EU-15 and the EU-10 have not yet gained much from the new imports coming from EU-10 countries.

These results exemplify the importance of using more elaborate methods to analyze the structure of trade: For example, just considering the number of varieties may be misleading. In our case, the numbers suggest a very substantial increase for the EU-10 countries. However, because the the new varieties are imported only at low values, they do not matter that much. In the light of the gains from variety this means that consumers do not really gain much from the increase of the variety after the enlargement. This has already been hinted at using the intensive and extensive margins. However, the gains from variety draw an even clearer picture.

6 Concluding Remarks

The Enlargement of the European Union in the year 2004 has had large effects on the trade flows of the European countries. Descriptive statistics reveal that especially the "new" member states imported more in value and variety from the other EU-10 and EU-15 economies during the whole period of 1999 to 2007. Furthermore, the descriptive statistics hint at larger growth in traded value and variety in the period just after the enlargement. In contrast, the effects on imports of the "old" member states has been limited, before and after the accession.

We further analyse the trade structure by calculating the intensive and extensive margins of Hummels and Klenow (2005). Countries of the EU-10 experience growth of the intensive and extensive margins. Especially the extensive margins of intra EU-10 trade increased greatly during the whole period. Intra EU-10 trade has experienced a catch-up effect regarding the trade in extensive margins. In contrast, the extensive margins of the EU-15 countries stayed relatively constant. This is mainly due to already high level of these margins before 1999. Furthermore, the intensive margins of these countries decreased sharply after the enlargement: This is an indication for the higher importance in intra EU trade that the "new" member countries captured in the last few years.

Finally, the gains from imported variety resulting from intra EU trade are calculated as in Broda and Weinstein (2006) for the EU-10 and the EU-15 countries. As an expected result, the average gains are higher for the "new" member countries. They amount to an average of 0.24% of the GDP for EU-10 countries and to only 0.07% for EU-15 countries over the whole period. Surprisingly, the gains are a lot smaller after the enlargement for all EU countries. The reasons for this are two-fold: First, for the EU-15 countries the increase in variety has been slower after the enlargement. For the EU-10 countries the main reason is different: Although these economies have experienced a large growth in the number of imported variety, these varieties were not so important regarding their trade value. As a consequence, the sharp increase of the traded number of varieties observed using descriptive statistics did not translate into gains from variety for the consumer within the EU-10 countries. As a last result, virtually all the gains from traded variety stem from imports from the EU-15 countries. This is mainly a consequence of the lower magnitude of imports from EU-10 countries relative to imports of EU-15 countries present in all EU economies. **Ausblick, etc....**

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Appendix I: List of Tables

Table 1: Variety and value of EU-10 Imports from EU-15

	Number of Goods	Total Number of Varieties (Country-Good Pairs)	Average Number of Exporting Countries	Share on Total Imports	Average Value per Variety (1000 EUR)	Total Imports (Billion EUR)
	[1]	[2]	[3]	[4]	[5]	[6]
All 1999 Q1 goods	37'389	133'744	3.12	1.00	140	18'785
All 2007 Q4 goods	43'322	207'638	4.27	1.00	266	55'239
Common 99 Q1	29'577	114'741	3.38	0.86	140	16'073
Common 04 Q1	29'577	164'145	4.97	0.83	281	46'073
99 Q1 not in 07 Q4	7'812	19'003	2.31	0.14	143	2'712
07 Q1 not in 99 Q1	13'745	43'493	3.06	0.17	211	9'165
All 1999 Q1 goods	37'389	133'744	3.12	1.00	140	18'785
All 2004 Q1 goods	40'571	156'242	3.42	1.00	208	32'487
Common 99 Q1	30'935	121'403	3.42	0.92	143	17'345
Common 04 Q1	30'935	136'376	3.96	0.91	216	29'417
99 Q1 not in 04 Q1	6'454	12'341	1.88	0.08	117	1'440
04 Q1 not in 99 Q1	9'636	19'866	2.06	0.09	155	3'070
All 2004 Q1 goods	40'571	156'242	3.42	1.00	208	32'487
All 2007 Q4 goods	43'322	207'638	4.27	1.00	266	55'239
Common 04 Q1	32'972	139'254	3.76	0.89	209	29'057
Common 07 Q4	32'972	178'477	4.80	0.90	279	49'865
04 Q1 not in 07 Q4	7'599	16'988	2.20	0.11	202	3'430
07 Q4 not in 04 Q1	10'350	29'161	2.77	0.10	184	5'374

Table 2: Variety and Value of EU-10 Imports from EU-10

	Number of Goods	Total Number of Varieties (Country-Good Pairs)	Average Number of Exporting Countries	Share on Total Imports	Average Value per Variety (1000 EUR)	Total Imports (Billion EUR)
	[1]	[2]	[3]	[4]	[5]	[6]
All 1999 Q1 goods	17'525	41'243	2.05	1,00	65,44	2'698
All 2007 Q4 goods	23'091	68'850	2.62	1,00	235,77	16'232
Common 99 Q1	13'728	34'532	2,28	0,86	66,95	2'311
Common 04 Q1	13'728	49'136	3,15	0,78	257,71	12'662
99 Q1 not in 07 Q4	3'797	6'711	1,63	0,14	57,64	0'386
07 Q1 not in 99 Q1	9'363	19'714	2,03	0,22	181,07	3'569
All 1999 Q1 goods	17'525	41'243	2.05	1,00	65,44	2'698
All 2004 Q1 goods	20'567	53'889	2.32	1,00	109,25	5'887
Common 99 Q1	14'168	36'085	2,30	0,90	67,13	2'422
Common 04 Q1	14'168	43'295	2,69	0,87	118,51	5'130
99 Q1 not in 04 Q1	3'357	5'158	1,45	0,10	53,58	'276
04 Q1 not in 99 Q1	6'399	10'594	1,62	0,13	71,45	'756
All 2004 Q1 goods	20'567	53'889	2.32	1,00	109,25	5'887
All 2007 Q4 goods	23'091	68'850	2.62	1,00	235,77	16'232
Common 04 Q1	16'649	47'008	2,58	0,91	113,42	5'331
Common 07 Q4	16'649	56'455	3,07	0,86	248,46	14'026
04 Q1 not in 07 Q4	3'918	6'881	1,64	0,09	80,83	'556
07 Q4 not in 04 Q1	6'442	12'395	1,86	0,14	177,86	2'205

Table 3: Variety and Value of EU-15 Imports from EU-10

	Number of Goods	Total Number of Varieties (Country-Good Pairs)	Average Number of Exporting Countries	Share on Total Imports	Average Value per Variety (1000 EUR)	Total Imports (Billion EUR)
	[1]	[2]	[3]	[4]	[5]	[6]
All 1999 Q1 goods	20'104	68'883	2.89	1.00	228	15'723
All 2007 Q4 goods	21'967	94'306	3.65	1.00	576	54'324
Common 99 Q1	14'255	55'978	3.32	0.88	248	13'857
Common 07 Q4	14'255	74'443	4.34	0.78	569	42'374
99 Q1 not in 07 Q4	5'849	12'905	2.06	0.12	145	1'865
07 Q1 not in 99 Q1	7'712	19'863	2.51	0.22	602	11'951
All 1999 Q1 goods	20'104	68'883	2.89	1.00	228	15'723
All 2004 Q1 goods	21'828	85'678	3.36	1.00	358	30'669
Common 99 Q1	15'676	60'719	3.27	0.94	245	14'857
Common 04 Q1	15'676	73'720	3.96	0.93	388	28'639
99 Q1 not in 04 Q1	4'428	8'164	1.74	0.06	106	866
04 Q1 not in 99 Q1	6'152	11'958	1.95	0.07	170	2'029
All 2004 Q1 goods	21'828	85'678	3.36	1.00	358	30'669
All 2007 Q4 goods	21'967	94'306	3.65	1.00	576	54'324
Common 04 Q1	16'174	73'629	3.89	0.89	368	27'165
Common 07 Q4	16'174	80'911	4.22	0.83	560	45'273
04 Q1 not in 07 Q4	5'654	12'049	2.07	0.11	291	3'503
07 Q4 not in 04 Q1	5'793	13'395	2.25	0.17	675	9'051

Table 4: Variety and Value of EU-15 Imports from EU-15

	Number of Goods	Total Number of Varieties (Country-Good Pairs)	Average Number of Exporting Countries	Share on Total Imports	Average Value per Variety (1000 EUR)	Total Imports (Billion EUR)
	[1]	[2]	[3]	[4]	[5]	[6]
All 1999 Q1 goods	57'024	419'458	6.77	1,00	717	300'738
All 2007 Q4 goods	58'400	454'023	7.25	1,00	1083	491'885
Common 99 Q1	47'292	370'204	7,13	0,87	707	262'045
Common 07 Q4	47'292	399'490	7,76	0,85	1044	417'206
99 Q1 not in 07 Q4	7'790	36'163	4,74	0,08	849	30'728
07 Q1 not in 99 Q1	6'967	30'289	4,97	0,08	1226	37'132
All 1999 Q1 goods	57'024	419'458	6.77	1,00	717	300'738
All 2004 Q1 goods	59'223	448'798	7.01	1,00	889	399'140
Common 99 Q1	51'091	396'855	7,07	0,94	710	281'835
Common 04 Q1	51'091	417'285	7,46	0,92	884	369'106
99 Q1 not in 04 Q1	5'933	22'603	4,19	0,06	836	18'903
04 Q1 not in 99 Q1	8'132	31'513	4,30	0,08	953	30'304
All 2004 Q1 goods	59'223	448'798	7.01	1,00	889	399'140
All 2007 Q4 goods	58'400	454'023	7.25	1,00	1083	491'885
Common 04 Q1	51'433	412'635	7,36	0,92	892	368'411
Common 07 Q4	51'433	423'734	7,59	0,92	1073	454'752
04 Q1 not in 07 Q4	7'790	36'163	4,74	0,08	849	30'728
07 Q4 not in 04 Q1	6'967	30'289	4,97	0,08	1226	37'132

Table 5: Annual Aggregated Import Price Index Biases

	1999	2000	2001	2002	2003	2004	2005	2006	2007	**1999-2001**	**1999-2004**	**2004-2007**
France	0.09%	0.03%	-0.50%	0.16%	0.00%	-0.02%	-0.04%	-0.04%	-0.09%	**-0.41%**	**-0.21%**	**-0.20%**
Netherlands	0.11%	-1.05%	-0.02%	0.03%	-0.01%	0.10%	0.01%	-0.14%	-0.05%	**-1.03%**	**-0.96%**	**-0.07%**
Germany	0.06%	0.07%	-0.03%	0.05%	-0.01%	0.21%	-0.10%	-0.10%	-0.08%	**0.07%**	**0.15%**	**-0.08%**
Italy	0.09%	0.06%	-0.04%	0.01%	0.05%	0.46%	-0.06%	-0.12%	-0.05%	**0.42%**	**0.18%**	**0.24%**
Great Britain	0.08%	0.18%	1.01%	0.15%	0.05%	0.10%	0.04%	-0.01%	-0.04%	**1.56%**	**1.47%**	**0.09%**
Ireland	0.16%	0.03%	-0.02%	0.15%	-0.04%	0.38%	-0.02%	-0.17%	0.17%	**0.63%**	**0.27%**	**0.36%**
Denmark	0.01%	0.00%	-0.05%	0.06%	0.02%	0.55%	-0.02%	-0.03%	-0.35%	**0.19%**	**0.04%**	**0.16%**
Greece	0.07%	0.05%	-0.05%	0.30%	0.06%	0.08%	0.05%	-0.25%	-0.04%	**0.27%**	**0.43%**	**-0.16%**
Portugal	0.05%	0.02%	-0.03%	0.02%	0.02%	1.14%	-0.01%	-0.17%	-0.10%	**0.95%**	**0.08%**	**0.87%**
Spain	0.32%	-0.11%	-0.06%	0.24%	-0.01%	0.01%	-0.03%	-0.49%	-0.21%	**-0.33%**	**0.39%**	**-0.72%**
Belgium	0.13%	0.03%	-0.03%	0.07%	-0.04%	0.27%	-0.04%	-0.23%	0.01%	**0.18%**	**0.16%**	**0.02%**
Luxemburg	0.68%	0.05%	-0.17%	0.22%	0.14%	0.23%	2.03%	-0.65%	0.61%	**3.13%**	**0.92%**	**2.22%**
Sweden	0.10%	0.04%	-0.05%	0.07%	0.03%	0.25%	0.33%	-0.11%	-0.08%	**0.57%**	**0.19%**	**0.39%**
Finland	0.09%	0.04%	-0.08%	0.10%	0.02%	0.24%	0.02%	-0.17%	-0.06%	**0.21%**	**0.18%**	**0.03%**
Austria	0.20%	0.13%	-0.10%	0.08%	0.18%	0.34%	0.01%	-0.12%	0.00%	**0.73%**	**0.49%**	**0.24%**
Malta	0.02%	-0.07%	-0.06%	0.04%	-0.24%	0.83%	0.09%	-0.23%	-0.14%	**0.25%**	**-0.31%**	**0.56%**
Estonia	0.01%	-0.29%	0.04%	-0.01%	0.05%	0.17%	0.33%	-0.24%	-0.14%	**-0.08%**	**-0.20%**	**0.12%**
Latvia	0.08%	-0.01%	0.01%	-0.01%	0.07%	0.36%	0.16%	-0.17%	0.00%	**0.48%**	**0.14%**	**0.34%**
Lithuania	0.05%	0.01%	-0.02%	0.07%	0.03%	0.15%	-0.05%	-0.37%	0.00%	**-0.13%**	**0.14%**	**-0.27%**
Poland	0.16%	0.02%	0.00%	0.41%	-0.01%	0.46%	-0.27%	-0.09%	-0.10%	**0.56%**	**0.58%**	**-0.01%**
Czech Republic	0.01%	0.01%	-0.04%	0.30%	-0.03%	0.13%	0.12%	-0.13%	-0.01%	**0.37%**	**0.25%**	**0.12%**
Slovakia	0.03%	0.23%	0.85%	0.06%	0.02%	0.60%	0.07%	-0.14%	-0.15%	**1.56%**	**1.19%**	**0.38%**
Hungary	0.65%	0.01%	0.01%	0.20%	0.03%	0.20%	0.01%	-0.13%	-0.10%	**0.88%**	**0.90%**	**-0.02%**
Slovenia	0.12%	0.00%	-0.02%	0.19%	0.08%	0.19%	-0.03%	-0.08%	-0.05%	**0.39%**	**0.36%**	**0.02%**
Cyprus	0.05%	0.07%	0.44%	-0.01%	0.02%	0.19%	-0.06%	-0.11%	0.02%	**0.62%**	**0.57%**	**0.04%**

Table 6: Total Bias, EU-15 and EU-10

	1999-2007	1999-2004	2004-2007
EU-15 (weighted)	0.30%	0.32%	-0.02%
EU-10 (weighted)	0.59%	0.55%	0.04%

Table 7: Total Gains from Variety, EU-15 and EU-10

	1999-2007	1999-2004	2004-2007
EU-15 (weighted)	0.066%	0.065%	0.001%
EU-10 (weighted)	0.240%	0.214%	0.025%

Table 8: Contribution of EU-15 and EU-10 to the Gains

	1999-2007		1999-2004		2004-2007	
	EU-15	EU-10	EU-15	EU-10	EU-15	EU-10
EU-15 (weighted)	0.32%	-0.02%	0.32%	0.00%	0.00%	-0.02%
EU-10 (weighted)	0.60%	-0.01%	0.54%	0.01%	0.06%	-0.02%

Appendix II: List of Figures

Figure 1: Total Value of Imports 1999 Q1 to 2007 Q4 (1999 Q1 = 100)

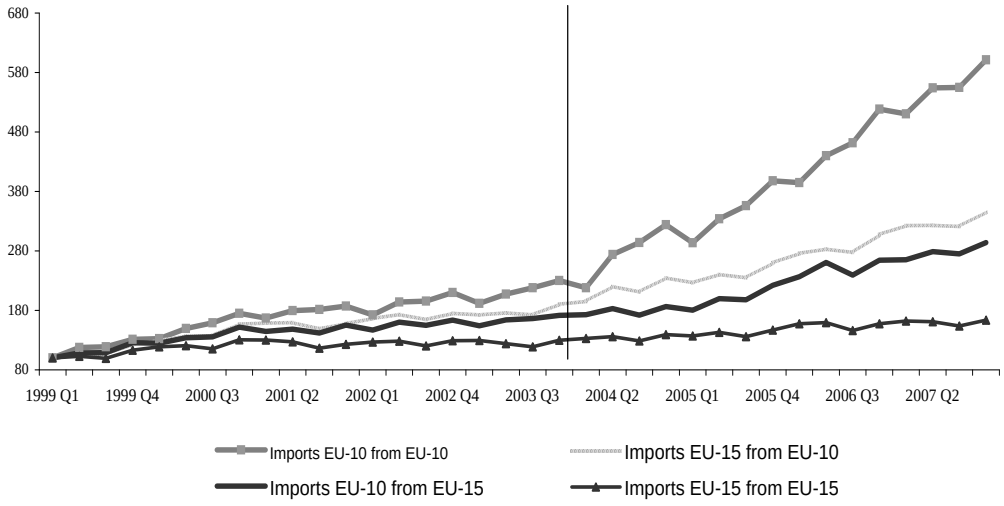

Figure 2: Imported Variety 1999 Q1 to 2007 Q4 (1999 Q1 = 100)

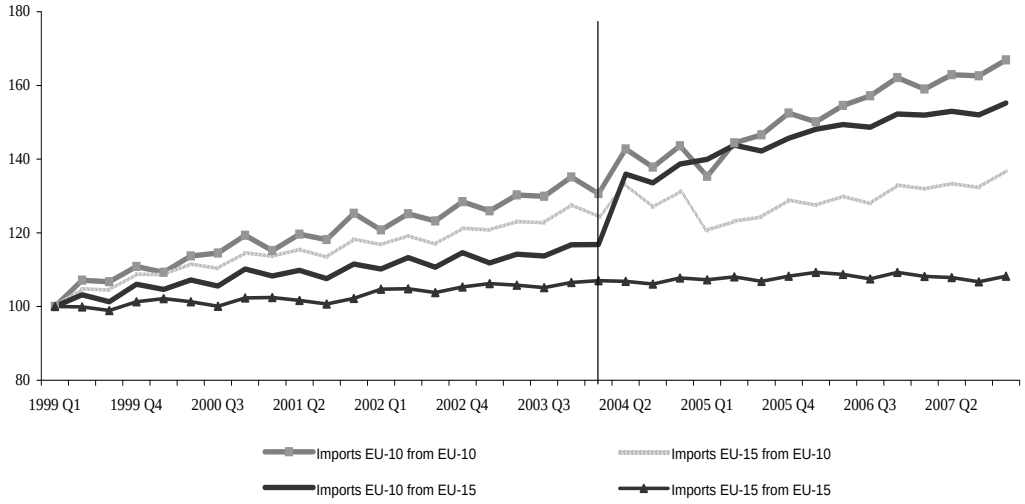

Figure 3: Average Value per Variety 1999 Q1 to 2007 Q4 (1999 Q1 = 100)

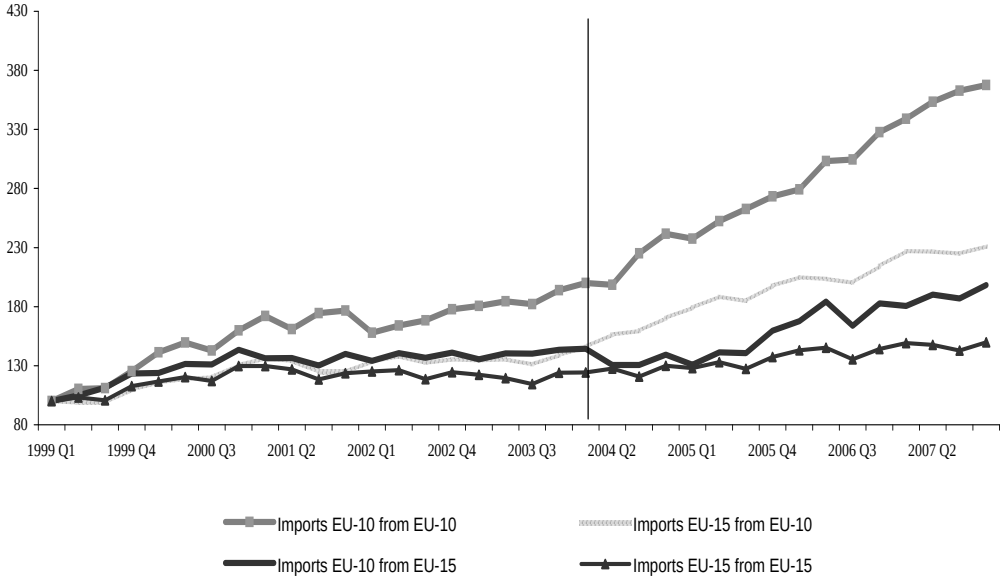

Figure 4: Intensive Margins of EU-10 Imports from EU-10 and EU-15

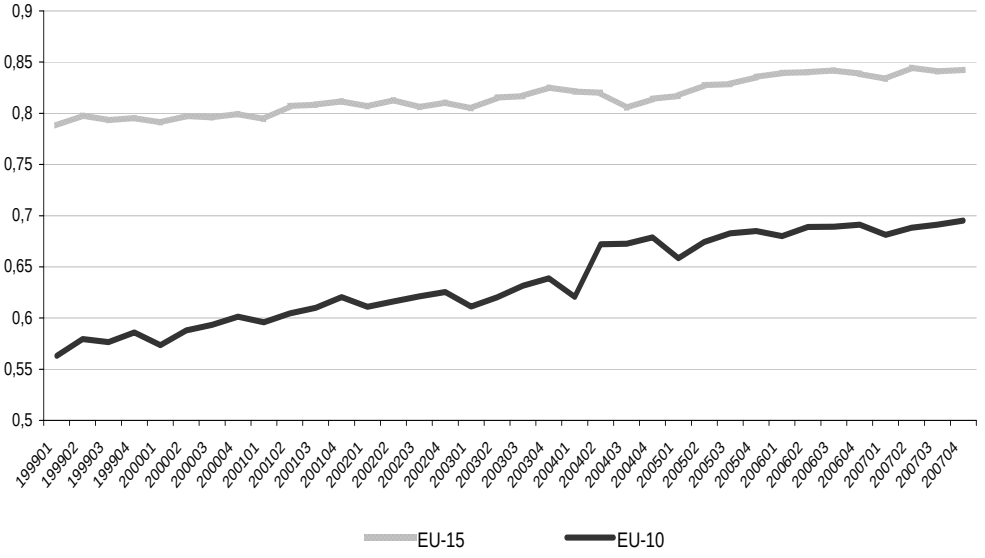

Figure 5: Extensive Margins of EU-15 Imports from EU-10 and EU-15

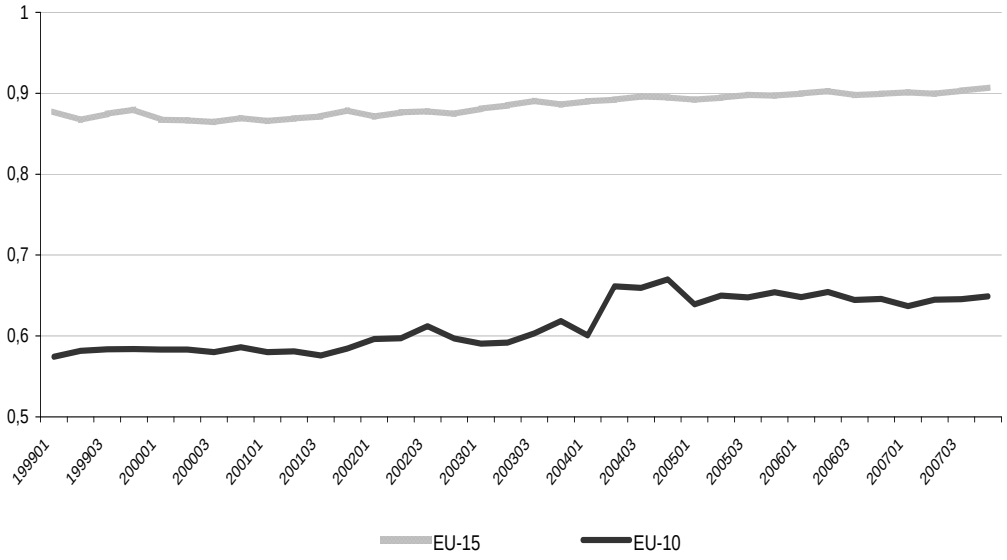

Figure 6: Intensive Margins of EU-10 Imports from EU-10 and EU-15

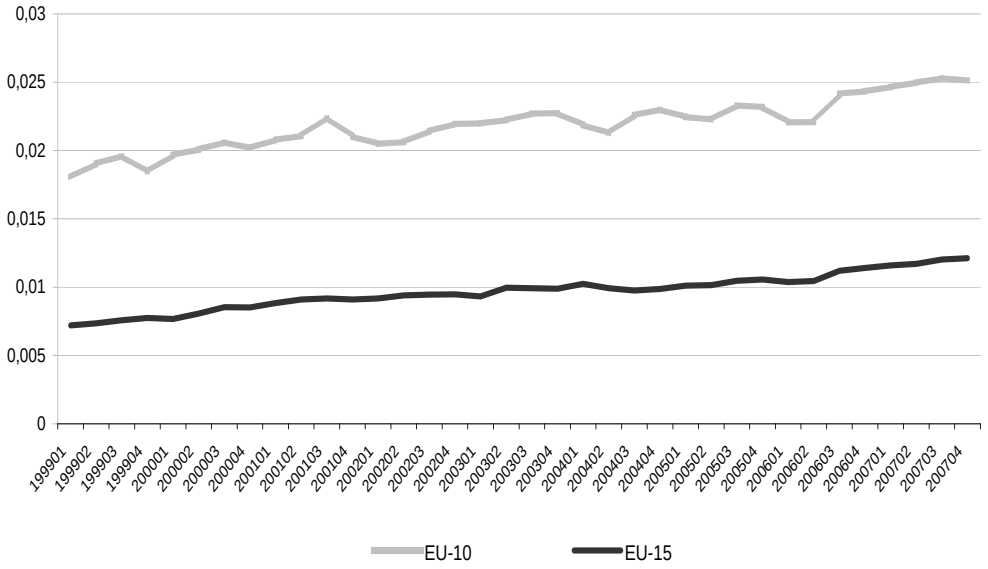

Figure 7: Intensive Margins of EU-15 Imports from EU-10 and EU-15