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ABSTRACT

Import Diversion under European Antidumping Policy*

This Paper studies empirically the effects of European antidumping actions on import diversion from importers 'named' in an antidumping investigation, and potentially subject to protectionist measures, to countries 'not named' in the investigation. For this purpose we use a unique data set at the 8-digit product level. The amount of import diversion can be regarded as an indication of the effectiveness of antidumping policy, which is used to protect the home industry from foreign imports. We find that trade diversion in the European Union caused by antidumping actions – in contrast to the US – is limited, suggesting that the EU's antidumping policy is more effective in keeping imports out. This result holds even after controlling for selection bias in the antidumping investigation procedure. A number of explanations for this difference in trade diversion as a result of antidumping policy between the EU and US are formulated.

JEL Classification: F13, L13, L50
Keywords: antidumping measures, econometric testing, trade diversion

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NON-TECHNICAL SUMMARY

This Paper aims to assess empirically the amount of import diversion resulting from European antidumping cases initiated in the period 1985–90. Import diversion refers to a shift in trade flows away from countries whose imports are under investigation for dumping their products on the European market to benefit countries that import the same type of product but are not targeted by the EU. Import diversion suggests that there are winners and losers in terms of import flows into the EU. For about 250 antidumping cases we look at a very disaggregated level of import data at the product level, resulting in somewhat less than 3000 observations. Not surprisingly we find that those countries under scrutiny for dumping (named countries) experience a significant reduction of imports into the EU. This is what also has been found in other empirical studies, notably by Prusa (1997) for the US and by Brenton (2000) for the EU.

In this Paper special attention goes to the trade effects on those extra-EU countries not under investigation for dumping but importing the same type of products as the alleged dumpers (non-named countries). The question is to what extent can they benefit from the fact that the alleged dumpers lose trade with the EU. The evidence for the EU has so far been inconclusive. For this reason we spend a lot of attention checking the robustness of our results by using various estimation models and methods. All results go in the same direction. The increased trade for the non-named countries as a result of antidumping cases against rival importers in the EU is *not* significant.

This result is an important one in view of future policy talks on the antidumping code. Our findings suggest that European antidumping policy is effective in protecting its domestic producers against foreign competitors. These findings sharply contrast with the findings of Prusa (1997) for the US. He finds that the increase in imports from countries not involved in a US antidumping case but importing the same product into the US gain significantly. The imports of the non-named countries go up after their rivals on the US market are subject to dumping investigations. Prusa (1997) argues that the overall imports of the targeted product increases. This suggests that for the US, antidumping policy meant to protect domestic producers from imports is not very effective.

The lower amount of import diversion we find for Europe could be due to a number of reasons. One possible explanation is that the lower duty levels in the EU limit the benefits of protection for the non-named countries. An additional explanation is the lack of transparency and the greater extent of uncertainty regarding the actual levels of protection in Europe that could explain the more prudent reactions by exporters from non-named countries to the EU. And finally, the higher degree of market fragmentation in Europe could also explain the lower degree of import diversion.

I. Introduction

Consecutive multilateral trade talks at the level of the WTO have resulted in a general reduction of tariffs and VERs on trade between member countries. However, non-tariff barriers have remained an important policy instruments that is used intensively by the US and the European Union. In particular, the use of antidumping measures seems at least in part to have replaced the tariffs and VERs. One important distinction between the traditional and the new forms of trade protection is that the latter are generally felt to be more selective and less transparent (Ethier and Fischer, 1990).

Antidumping protection can only be imposed on products (8 digits) coming from countries 'named' by the import competing home industry as alleged dumpers. The purpose of this paper is to analyse empirically the pattern of import flows at the product level of 'named' versus 'non-named' (extra EU) importers in Europe (EU) for antidumping cases initiated between 1985-1990.

By now there is a large body of theoretical work which suggests that antidumping policy has an effect on trade flows. (Fischer (1992), Reitzes (1993), Prusa (1994), Pauwels et al. (1997), Anderson (1993), Blonigen and Ohno (1998)). However, most of these models have looked at the effects of antidumping measures on countries *named* in an antidumping investigation. The extent to which trade flows from *non-named* countries not belonging to the EU are affected is therefore still very much an empirical issue.

For the US, a small number of empirical studies have looked at the issue of import diversion as a result of antidumping policy. For example Staiger and Wolak (1994) for the US use 4 digit sector level data and find evidence of trade

diversion during the investigation period whereby 'overall' imports (from both named and non-named) are restricted by about one third to one half as much as imports from named countries are restricted.

Prusa (1997) uses data at the product level (TSUSA seven digit data) for the US and finds the amount of trade diversion from named to non-named countries as a result of *US* antidumping protection on imports to be *high*. When considering a period of six years after the year of initiation of an antidumping case, Prusa (1997) finds that most of the protective effect of import duties is offset by increased imports from non-named countries. Prusa's results suggest that that US antidumping policy is largely ineffective in protecting domestic producers. Recently, Brenton (2000) studies trade diversion for the EU. His results suggest that trade diversion may exist for non-EU countries, although the evidence is not very conclusive.

In this paper we measure the effects of *European* antidumping measures on import flows and **w**e find that import diversion from named to non-named countries as a result of EU antidumping protection is *low*. The low amount of import diversion from named to non-named countries as a result of EU antidumping policy holds irrespective of the estimation method and econometric model that we use (although the *magnitude* of the effects of antidumping measures varies according to the method and model we use).

This result clearly has relevance for policy. The amount of trade diversion induced by antidumping policy can reflect the effectiveness of antidumping policy as a tool for protection. Our results suggest that antidumping policy is much more effective in the EU than it is in the US in protecting the domestic industry from foreign imports. This may be important for future negotiations on

antidumping issues and related aspects like competition policy at the level of the WTO [1].

The rest of the paper is structured as follows. In section II we describe the data and describe the pattern of trade flows for named and non-named countries. Section III discusses the econometric approach, section IV gives and discusses the empirical results. A number of explanations as to why trade diversion for Europe is lower than for the US are put forward. Section V is a concluding one.

II. Data

The data set we use consists of all European AD-investigations[2] initiated between 1985 and 1990. This resulted in 246 cases[3] of which 105 ended in the imposition of duties (42 %), 61 in price-undertakings[4] (25%) and in 80 cases the investigation was terminated by the Commission (33%). For each investigated *product*, annual import trade data of the EU by source country were collected from the EUROSTAT trade statistics. Up to 1988 Eurostat reports data using the Nimexe 6 digit product codes, while after 1988 the 8 digit Harmonised System (HS) codes are used to identify products. In order to construct full time series for

[1] The initial discussion in Seattle of setting up a new WTO round in the Fall of 1999 failed.

[2] Source: various issues of the Official Journal of the European Community.

[3] Each case involves one product. After dropping cases for which no complete time-series could be constructed we were left with 246 products.

[4] A price-undertaking is a commitment by the foreign importer to eliminate injury by pulling up its price in the European market. This commitment is imposed and closely monitored by the Commission and in case of violation heavily penalized. Price-undertakings are shown to be facilitating practices for home and foreign firms involved in EU antidumping cases (see Veugelers and Vandenbussche 1999).

certain cases the Nimexe 6-digit and the HS 8-digit codes were correlated using correspondence tables. For each product, import values by country of origin were collected for nine consecutive years[5] starting two years before the initiation of an antidumping investigation by the European Commission[6]. The year of initiation, which can lie between the year 1985 and 1990, is indicated by t_0. The period of investigation following the initiation of a case lasts on average twelve months and usually corresponds with time t_1 during which the outcome of an investigation is still uncertain. Antidumping protection in the EU is *prospective* in the sense that measures are imposed for five years if the investigation is concluded affirmatively. Hence, the period of protection usually runs from t_1 to t_6. In order to compare the import values[7] over time, the time series were deflated using GNP-price deflators.

Between 1985 and 1990, a total of 48 countries were subject to European AD-investigations. Table 1 shows the geographical spread of countries accused of dumping in the EU market over this period. About 70% of all antidumping cases are against less developed countries (category 2 and 3). The pattern of named countries described in table 1 is very similar to the US, where most antidumping cases are also initiated against less developed countries (Prusa, 1997). Messerlin and Reed (1995) and Belderbos (1997) point at the similarity of the EU and US in terms of the type of sectors and products occurring in antidumping cases. This suggests the absence of a country and sector bias specific to one of the two trade blocs.

[5] A correction was applied to Eastern European countries that either stopped to exist after 1990 (German Democratic Republic) or that were split into separate countries or regions like Czechoslovakia, Yugoslavia and the Sovjet Union.

[6] Since we consider antidumping cases initiated between 1985-90, total data requirements run from 1983 to 1996.

In table 2 we list the European sectors (NACE 2 digit classification) most frequently filing dumping complaints to the EU Commission. Especially the chemical industry (magnesite, copper sulphate, urea), and to a lesser extent the Processing of Metals Industry (iron and steel and non-ferrous metals), Mechanical Engineering (transmission equipment like ball bearings and roller chains) and Electric engineering (typewriters, printers, copiers) seem to trigger AD-investigations.

In table 3 we show summary statistics on the import values and import growth that characterise our data set. Both the mean and the median values for the named, non-named and overall import values at t_0, the year of initiation, are shown. First, it can be noted that the mean and median imports size are lower in named than in non-named countries. Indeed, the average share of named countries' imports in total imports at t_0 is 26% while 74% for the non-named countries. In addition, named countries' import values often show very high import growth rates at the time of initiation as shown in the last two rows of table 3. The average growth for the named countries at t_0 is almost 2000%. This extremely high mean value is due to a number of outliers in the data. To give just one example. In 1985 the Commission started a dumping investigation against typewriters' imports from Taiwan. While Taiwanese import values were still zero two years prior to t_0, they rose from a 1,000 ECU in the year before t_0 to 4,259, 000 ECU in the year t_0. Cases like this one are an illustration that these outliers are often new importers entering the EU market aggressively with very high import growth rates. The median growth rate in the data is more representative however and is similar for named and non-named countries, 0 and –2% respectively.

[7] Import values were used which involve the unit price times the quantity shipped to the

A first indication of whether import diversion in response to European antidumping cases takes place can be found in figure 1, where we show the evolution of import values at the product level averaged over all AD-cases distinguishing between named and non-named countries (including outliers) imports' share. Observations above the horizontal axis reflect an increase in the share of import values relative to t_0, while observations below the horizontal axis represent the opposite namely a reduction in the share of import values relative to t_0. The different effects on the named countries imports' share relative to the share of the non-named become immediately apparent from figure 1. All the lines that lie *below* the horizontal axis after t_0 show the evolution of the *named* countries' import share, while all the lines *above* the horizontal axis represent the *non-named* countries' import share relative to total imports. For the named countries, the effects of a duty and a price-undertaking on the import share appear to be more negative than under a termination. However, even in the case of the latter, when the demand for protection is rejected, imports from named countries continue to be restricted. They do not rebound to the levels at the time of initiation. For the non-named countries, the share in total import values on average goes up relative to t_0. This increase appears to be stronger in duty and price-undertaking cases than in terminated cases. The distance between the upward sloping curves for the non-named and the downward sloping curves for the named countries gives us a first rough idea of the amount of import diversion from the named to the non-named countries which will be tested for more rigorously in the next section controlling for outliers, sector and business cycle effects. Based on figure 1, it seems that import diversion is not sufficient to mitigate the effects of antidumping actions.

EU.

III. **Econometric Model**

The main objective in this section is to test whether import diversion in Europe is sufficient to mitigate the effects of antidumping actions as it is the case in the US, after taking into account other factors that may influence import flows. To this end, we experimented with a variety of econometric methods and models, which allows us to assess the robustness of the estimates.

The basic econometric model we seek to estimate is a reduced form with the following general specification, which allows us to test a number of hypotheses. In particular,

$$\ln \text{imports}^{j}_{it} = \alpha_0 + \alpha_1 . \ln \text{imp}^{j}_{it0-1} + \alpha_2 D_{it} + \alpha_3 U_{it} + \alpha_4 T_{it} + \alpha_5 D_{it} x N_i$$

$$+ \alpha_6 U_{it} x N_i + \alpha_7 T_{it} x N_i + \alpha_8 \text{Num}_i . + \alpha_9 \text{Num}_i x N_i + \alpha_{10} N_i + \varepsilon^{j}_{it} \quad (1)$$

where $\ln \text{imports}^{j}_{it}$ stands for the natural log of imports for case i (i =1,..246) at time t (t=0,…6) for country group j (named, non-named). Each case refers to a product at the 8 digit level. We expect to find a negative effect of antidumping policy on the imports of product i for the named countries and a positive effect (=trade diversion) for the non-named countries. As explanatory variables on the right hand side of (1) we first have imports in the year prior to initiation ($\ln \text{imports}^{j}_{it0-1}$). In equation (1) t_0 refers to the year of initiation, which varies between 1985 and 1990, and subscript t_{0-1} refers to the year just before the case

was initiated. This variable is included to control for initial import size effects and for the evolution of imports prior to an antidumping investigation. This could be important, as the average total import value for named countries is smaller than the one for non-named countries as shown in table 3.

Other explanatory variables include a dummy *D* equal to 1 if there is a duty for case i at time t, a dummy *U* equal to 1 if there is a price undertaking for case i at time t and a dummy *T* equal to 1 if there is a termination for case i at time t. In addition a dummy *N* is included for named countries (equal to 1 for named countries in case i and equal to 0 for non-named). This dummy is also used to interact with the policy variables to capture the effects of antidumping actions on the named countries (*DxN*, *UxN*, *TxN*). The variable *Num* proxies for the number of named countries in a case and is the log number of countries that are named in an investigation. *Num* captures the effect that trade diversion will be lower when many countries are named as in Prusa (1997).

In estimating equation (1) we also take into account year dummies to control for aggregate shocks[8]. This can be relevant as firms may have incentives to file a complaint in recessions when dumping and injury are more likely to be demonstrated (Das, 1992). In addition, we control for unobserved fixed effects by including 3-digit NACE-sector dummies. These sector dummies control for unobserved sector heterogeneity, such as sunk costs, the life cycle of the sector (mature versus young), etc. and hence these dummies can capture to some extent a possible selection bias. By including sector dummies we control for the incidence that certain sector characteristics may trigger antidumping

[8] We also experimented with interacting time dummies with the AD measures, in addition to intercept dummies, however, this imposes high multicolllinearity and we therefore do not report these results.

investigations more easily than others. By controlling for narrowly defined sector dummies, we can control for these unobservable fixed characteristics.

The effects of import diversion can be read off by comparing the effects of duties (D), undertakings (U) and terminations (T) with the same variables interacted with a dummy equal to 1 for named countries (N), DxN, UxN and TxN. To illustrate how this equation should be interpreted, the effect of duties (D) on the import values of the non-named countries is measured by coefficient α_2 and for the named countries by the sum of α_2 and α_5.

In table 4a we show the estimates of model (1). In the first column we use OLS with heteroskedastic consistent standard errors. The reason for this lies in the nature of the data. Observations within a case over time are not independent, while observations across cases are. Hence when estimating the model in (1) with OLS consistent standard errors, the observations in each case are considered as one cluster.

In column 1 we find no statistically significant effect of antidumping actions on imports from the non-named countries. In contrast, imports for the named countries are reduced with 67% in case a duty is imposed and 53% in case a price undertaking is imposed. Since measures in the EU are imposed for a period of 5 years ('Sunset Clause') this is equivalent to an average annual reduction in imports from the named countries of about 13% and 10% respectively. The magnitude of these effects come across as rather high. Nevertheless, the negative sign of the duty and price undertaking measures on named countries' import values is the expected one since duties and price undertakings raise consumer prices on the European market which reduces demand for imports from the named countries. Based on the estimates in column

(1) of table 4a we find that there is no statistically significant effect that indicates a presence of import diversion from the named to the non-named countries.

At this point in the analysis an important technical consideration needs to be made also relating to the nature of the data. As already illustrated in the summary statistics of table 3 there are a number of outliers in terms of import growth in the sample, due to the fact that some importers are newcomers on the EU market. The number and position of the outliers are shown in figure 4 where we plot log imports in t_{0-1} on the horizontal axis and log imports in t_0 on the vertical axis. The deviation from the 45°-degree line shows the growth rate in imports between t_{0-1} and t_0. We see that the number of outliers is substantial. Hence we can question the normality assumption required for OLS which could affect the average estimate in the regression analysis as shown in column 1 of table 4a in a spurious way. In column 2 of table 4a we properly control for outliers by using the robust regression technique (Hamilton, 1991) where outliers are given a lower weight ('Huber weights') relative to observations that are closer to the mean in the estimation of (1) (Huber, 1964).

Overall, the estimates for robust regression in column 2 of table 4a are smaller than for OLS which is what is not totally unexpected when controlling for outliers. In particular, we find that import values from the non-named countries are now increased by 13% when a duty is imposed, albeit at the 10% significance level. The imports from the named countries are reduced by 31% (-0.44+0.13) when a duty is imposed. This effect is almost half of the one found under OLS. In addition, a price-undertaking has a negative effect on import values of the named countries of 38% without significantly affecting the imports of the non-named. In contrast to the results in column (1), the coefficient on terminations for the named countries is –17% and statistically significant at the 10% level. This negative effect on named countries' imports, even when the demand for

protection is rejected, could be an indication of how much 'being under investigation' restricts imports of the named countries. While Staiger and Wolak (1994) and Harrison (1991) for the US find that being named disciplines imports as much as imposing a duty, the coefficient on terminations suggests an investigation effect that is somewhat smaller than the effects of actual protection. It is interesting to note that the effect of terminations becomes statistically significant once we control for outliers. Since the outliers presumably capture new aggressive entrants in the EU market, the robust regression could be interpreted more as representative for the traditional importers. This suggests that when traditional importers are under investigation, they will behave in a more careful way to avoid protection. In contrast, new and aggressive importers are not affected by being under investigation, perhaps because they anticipate protection in any case.

Based on the estimates of column (2) in table 4a we find that a duty increases imports from the non-named countries compared to t_0 on average per case with 8.7 Million ECU, while imports from the named ones decrease on average per case with 11.9 Million ECU. For price undertakings there is no statistically significant effect for non-named countries, while for named countries the estimates suggest an average decrease in imports of 14.6 Million ECU per case. Since 25% of all cases end in price undertakings, we may conclude that, as already suggested by the results of column (1), import diversion in the European Union is rather limited. This contrasts with the findings of Prusa (1997) for the US where import diversion is substantial enough to offset most of the negative effects on named countries.

Another consideration that needs to be made here is that equation (1) imposes restrictions on some variables in the model. For example, equation (1) assumes that the effects of the initial import levels are the same for named and

non-named countries. Therefore it is also useful to study the results based on split samples (named versus non-named). The results can be read off from table 4b. Again we make a distinction between the estimates of (1) using OLS adjusted for clusters and using the robust regression analysis. Irrespective of the estimation method, we find statistically significant effects of the antidumping measures only for the named countries, while no significant effects are found for the non-named ones. The split regressions suggest that antidumping measures are effective and that there is no great deal of import diversion taking place. Hence the qualitative result that import diversion is far lower in the EU than in the US, persists.

A final consideration when estimating (1) is related to a concern about selection bias. The fact that a country is named in an investigation might be triggered by high import growth prior to the initiation of a case. There may also exist other unobservable reasons (sector effects or other) which lead to a selection bias between named and non-named countries. In particular, we test whether 'being named' in an AD-investigation is random or not. If it is the case that certain characteristics of the group of named countries trigger them into this category, the regression estimates will be biased. This calls for the use of a two step Heckman estimation procedure to correct for selection bias (see also appendix). The key feature of this procedure is to use an observable variable, which is likely to affect selection into the group of, named versus non-named, but which is not included in explaining the regression of interest (Heckman, 1976; Greene, 1993). The results of applying the Heckman procedure are shown in table 4c. The test statistic λ, shown at the bottom of the table is significant, suggesting that selection bias is important and should best be controlled for (see appendix).

In step 1 of the Heckman procedure a probit model is used to estimate the probability of named versus non-named. As explanatory variables in the probit

regression we select the variables '*import growth of named (non-named) countries prior to the year of initiation*', (import growth t_{0-1}) as well as the '*log of imports value two years prior to the year of initiation'* (ln imports t_{0-2}). These variables are chosen because at t_0, the average import value of named countries is smaller than for non-named countries and by the fact that the outliers suggest that many of the named countries are new importers in the EU who enter aggressively and hence would have a high import growth rate prior to t_0. The results of this first step are shown in the bottom half of table 4c. Column 1 gives the results named while in column (2) we report the results for non-named. It can be noticed that import growth and the import value at t_{0-2} are both statistically significant in explaining the probability of being named (non-named). In particular, import growth has a positive and statistically significant effect for named countries, but a negative effect for the group of non-named ones. Also import size has a negative effect for named countries, but a positive one for non-named. This means that if the growth rate of imports is high before a case is initiated there is a higher probability of being named. Likewise, if the total import value of countries is high before a case is initiated there is a lower probability of being named. For the non-named group we find, as expected the opposite result: the higher the import growth before a case is initiated**,** the lower the probability of being in the non-named group. Likewise, the higher the total import value at t_{0-2}, the more likely a country will belong to the non-named group. These findings are consistent with the fact that new aggressive importers, with relatively low initial levels of total imports are likely to end up in an AD investigation.

In step 2 of the Heckman procedure the actual model of import diversion is estimated for named and non-named countries, but taken into account the possible selection into the group of named (non-named) countries. This is done by including as one of the regressors a transformation of the probability of being

named (non-named) that is estimated in step 1 (inverse Mills ratio). The regression results after controlling for selection bias are shown in the top half of table 4c. For named countries we find that duties reduce the import values by 37% or an annual average reduction of 7%. The effect of price-undertakings is smaller, -23% or an annual average reduction of 5%. For non-named countries in column (2) we find (after controlling for selection bias) that only price-undertakings have a positive and statistically significant effect of 17% on the imports of non-named countries over the period of protection or an annual average increase of 4%. The effects of duties are not statistically significant.

The results in table 4c indicate that when controlling for selection bias in the estimation of equation (1), the magnitude of the regression coefficients and the standard errors are different from those in the other regressions. However the qualitative result of low import diversion in the EU as a result of antidumping actions we found earlier, is confirmed. This also suggests that the potential selection bias in the previous regressions is not too much of a problem.

IV. Discussion

The main result that comes out of our econometric testing and that appears to be quite robust is that import diversion is lower in the EU than in the US (Prusa, 1997). A first potential explanation for our observations could lie in the legal rules governing antidumping in the two trade blocs. One important difference between the EU and the US is the level of antidumping protection. In the US the antidumping duty is always based on the dumping margin, while in the EU protection is limited to the injury margin provided it is smaller than the

dumping margin. The US rules are generally felt to lead to higher duty levels (Belderbos, 1997). The lower levels of protection in the EU puts a limit to the potential benefits for non-named importers which could explain the low amount of import diversion in the EU.

Another reason for the lower amount of import diversion in the EU could be the greater extent of uncertainty and information asymmetries surrounding the EU decision making process. Comparative political economy studies in this area have shown that antidumping decisions in the US are more of a 'technical nature' (Finger, Hall and Nelson, 1982; Baldwin and Steagall, 1994) while those in the EU are subject to greater political influence (Tharakan and Waelbroeck, 1994). The lower degree of transparency and predictability in the EU could be one of the possible explanations for the more prudent reaction of non-named importers in terms of increasing their import values[9].

A third reason could be related to the effects of AD-actions on decisions of firms to engage in foreign direct investment. Belderbos (1997) using firm level data of the Japanese electronics industry subject to European and American antidumping investigations, finds that Japanese firms are more likely to switch to tariff jumping FDI in response to European AD-actions than compared to the US. In the case of 'antidumping jumping ' FDI in Europe, imports from named countries are replaced by local production, which could explain the lower

[9] For example the retrospective system in the US gives importers, both named and non-named, an idea of the magnitude of the duty that will have to be paid by the named countries in the case of an affirmative finding. With the prospective system in the EU, the uncertainty regarding the duty lasts longer in particular for the non-named countries. Moreover, when price-undertakings are imposed the extent to which named countries have to pull up their prices is never revealed by the Commission in the Official Journal reports.

benefits to non-named countries through import diversion in Europe compared to the US.

Another possible explanation may be provided by market structure and the nature of competition as suggested by some theoretical models (Staiger and Wolak, 1992; Veugelers and Vandenbussche, 1999, Vandenbussche and Wauthy, 1999). The role of market structure is tentatively tested for in table 5 where we report the results of import diversion in lowly versus highly concentrated industries[10].

While the results for lowly concentrated sectors (columns 3 and 4) are in line with the general result of low trade diversion in Europe, the results for highly concentrated sectors stand in sharp contrast. Both for the OLS clustered technique reported in column (1) and the robust regressions in column (2) of table 5, we find trade diversion in highly concentrated from named to non-named countries to be quite strong (but not offsetting)[11]. A possible explanation for this is that in industries where the players are large and their number is limited, the effects of antidumping policy are offset by strategic rivalry, rendering antidumping policy largely ineffective in concentrated sectors.

The extent to which the larger amount of trade diversion for the US as reported by Prusa (1997), can be explained through concentration seems worth investigating. Lyons et al. (1999) find that the average C4 concentration level for Europe to be 20%, while the average for the US is 31%. One reason for the lower

[10] The classification is based on the average C5 production concentration ratio for the EU, defined at the three digit NACE sector level (Davies and Lyons, 1996). The average concentration ratio for our sample is 37% that we used as the cut off between highly and lowly concentrated sectors.

[11] Based on the estimates of column (2) duties increase imports from the non-named countries by 24 Million ECU on average per case, while imports from the named countries are reduced by 37 Million ECU on average per case.

concentration in Europe could be market segmentation which is higher in Europe than in the US. This may give firms a dominant position in some countries but not at the European level.

V. Conclusion

This paper studied how European antidumping policy affects import flows into the EU at the 8-digit product level from countries that were under investigation and either faced a duty, price-undertaking or a termination versus countries that were also importing the same product but that were not under investigation. In contrast to findings for the US, our results do not show strong import diversion effects suggesting that antidumping policy is more effective in Europe. The robustness of this result was tested using different estimation techniques. Low trade diversion was persistently found irrespective of the estimation method that was used.

The lower amount of import diversion in Europe could be due to a number of reasons. One possible explanation is that the lower duty levels in the EU limit the benefits of protection for the non-named countries. An additional explanation is the lack of transparency and the greater extent of uncertainty regarding the actual levels of protection in Europe that could explain the more prudent reactions by exporters from non-named countries' to the EU. And finally, the higher degree of market fragmentation in Europe could also explain the lower degree of import diversion.

Appendix:

The Heckman selection model assumes that a potential observation j is observed if

$z_j\gamma + u_{1j} > 0$,

where u_{1j} has a standard normal distribution. Simultaneously, there is another regression equation

$y_j = x_j\beta + \sigma u_{2j}$

where u_{2j} also has a standard normal distribution, but is potentially correlated with the error term of the first equation, with correlation r. If this is the case, standard regression techniques applied to the second equation (which in our case is equation (1)in the text), yield biased results. Heckman (1976) proposes a solution to estimate such a model simultaneously with maximum likelihood (see Greene, 1993). One test statistic, which is often reported is $\lambda = \sigma r$. If λ is statistically different from zero, then selection bias is important.

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Figure 1: Import Diversion from Named to Non-Named Countries Under EU Antidumping Policy

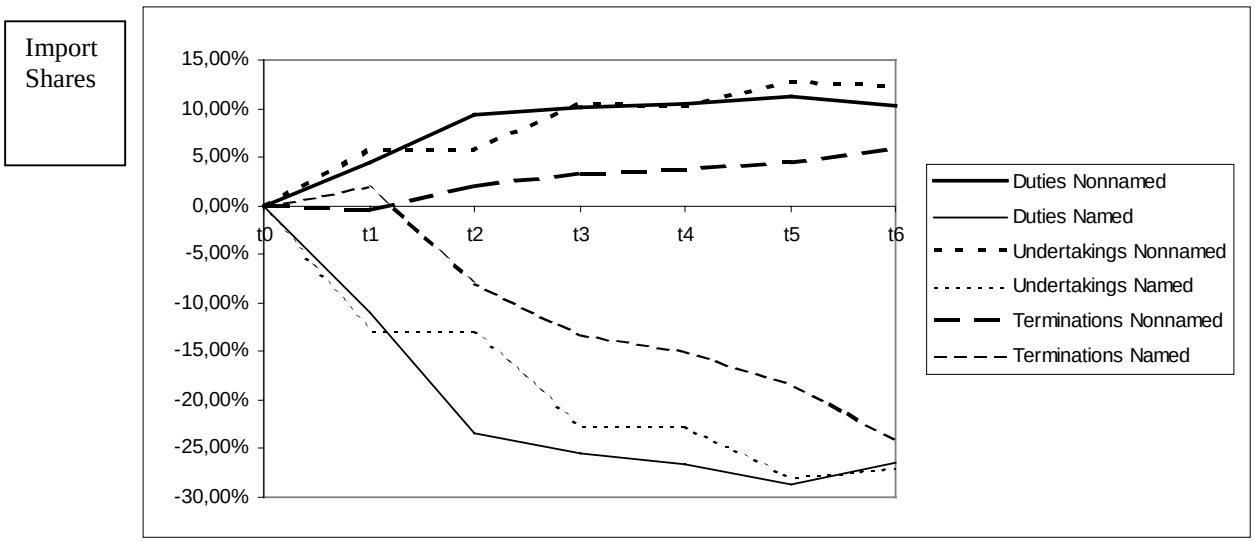
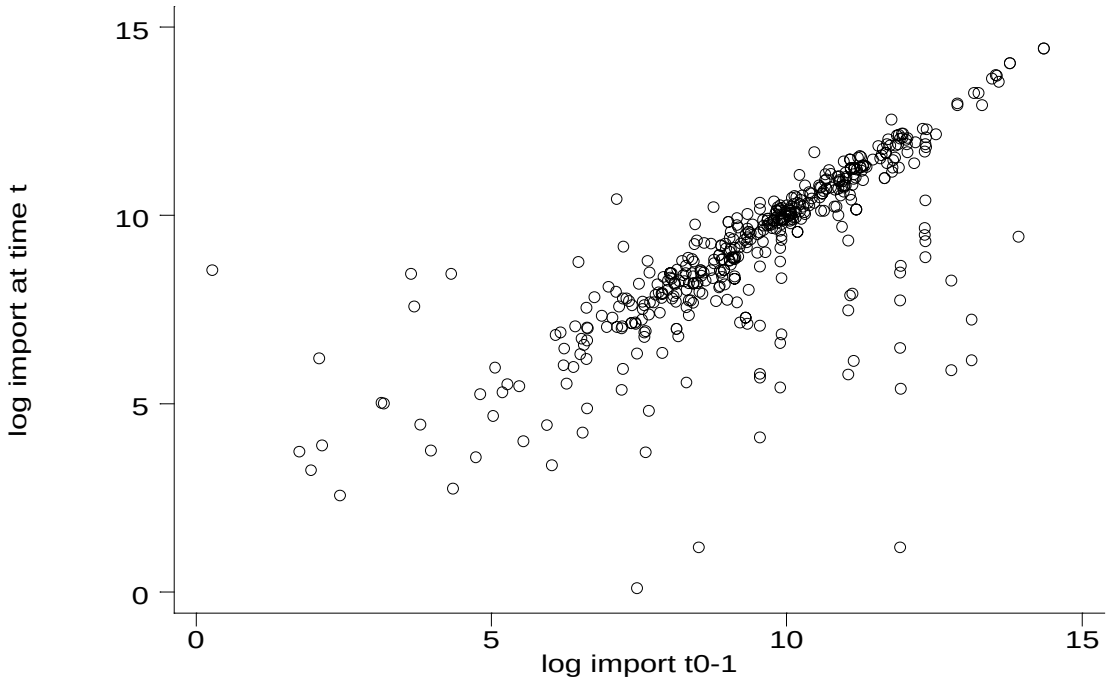


Figure 2: Correlation between ln import values of t_0 and t_{0-1}



orrelation log import at time t0 and log import at time t0-1

Table 1: AD-cases by Economic Status of Country

Type of country[12]	*Number of cases (% of TOTAL)*
Industrialised countries (1)	30.75%
Developing countries (2)	29.33%
Non-Market economies (3)	39.92%

(1) Efta, Portugal, Spain, GDR, USA, Canada, Japan, Turkey, Austria, Finland, Russia, Sweden
(2) Hong-Kong, Korea, Taiwan, Thailand, Singapore, Argentina, Brazil, Mexico, OPEC, Egypt, India, Macao, Malaysia, South Africa, Trinidad, Tobago, Israel
(3) Belarus, Bulgaria, Czechoslovakia, Czech Republic, Former Jug. Republic, Hungary, Poland, Romania, Slovakia, Ukraine, USSR, Yugoslavia, China

Table 2: EU sectors most frequently involved in AD-cases between 1985-90

Sector (NACE 2digit)	*% of cases*	*Sector (NACE 2digit)*	*% of cases*
Chemical industry	26.54	Manufacture of metal articles	3.09
Production and preliminary processing of metals	16.05	Instrument engineering	
		Processing of rubber and plastics	2.47
Mechanical engineering	12.35	Manufacture of paper and paper products	1.85
Electrical engineering	8.64		
Manufacture of office machinery and data-processing machinery	4.94	Footwear and clothing industry	1.85
		Other manufacturing industries	1.85
Man-made fibres industry	4.94		
Manufacture of non-metallic mineral products	4.94	Extraction of minerals other than metalliferous and energy-producing minerals	1.23
Textile industry	4.32		
Timber and wooden furniture industries	3.70	Extraction and preparation of metalliferous ores	0.62

Table3: Summary Statistics on Import Values at t_0

Variable	*Statistic*	*Overall*	*Named*	*Non-named*
Import values at t_0	Mean:	53,941	38,487	67,259
(x 1000 ECUs)	Median:	12,127	6,228	18,258
Import growth rates	Mean:	9.2	19.9	-0.02
from t_0-1to t_0	Median:	-0.01	0.005	-0.02

Table 4a: Effects of European AD-actions on imports

	(1) OLS	(2) Robust
Ln (import) $_{t0-1}$	0.75*	0.85
	(0.05)	(0.01)
Duty *(D)*	0.12	0.13**
	(0.10)	(0.07)
Undertaking *(U)*	0.17	0.10
	(0.13)	(0.08)
Termination *(T)*	0.04	-0.02
	(0.14)	(0.07)
Duty x Named *(DxN)*	-0.67*	-0.44*
	(0.15)	(0.09)
Undertaking x Named *(UxN)*	-0.53*	-0.38*
	(0.14)	(0.10)
Termination x Named *(TxN)*	-0.20	-0.17**
	(0.16)	(0.09)
Number *(Num)*	0.10	8.02
	(0.10)	(0.04)
Number x Named *(NumxN)*	0.25*	0.19*
	(0.10)	(0.05)
Named *(N)*	-0.32*	-0.29*
	(0.11)	(0.08)
Year dummies	yes	yes
Sector dummies	yes	yes
F	255.5	244.9
R^2	0.72	-
Number of observations	2997	2997

Note: In brackets are heteroskedastic consistent standard errors, * denotes significant at the 5% level, ** at the 10% level.

Table 4b: Effects of European AD-actions on imports

	(1) Named		(2) Non-named	
	OLS	Robust	OLS	Robust
Ln (import)$_{t0-1}$	0.09*	0.8*	0.82*	0.92*
	(0.08)	(0.01)	(0.04)	(0.01)
Duty *(D)*	-0.44*	-0.19*	0.04	-0.01
	(0.15)	(0.1)	(0.09)	(0.06)
Undertaking *(U)*	-0.36*	-0.24*	0.15	0.01
	(0.17)	(0.1)	(0.14)	(0.06)
Termination *(T)*	0.33	-0.02	-0.09	-0.08
	(0.19)	(0.1)	(0.13)	(0.06)
Number *(Num)*	0.46*	0.30*	0.03	0.04
	(0.17)	(0.06)	(0.10)	(0.03)
Year dummies	yes		yes	
Sector dummies	yes		yes	
R^2	0.67	-	0.78	-
F-test	4442	89.54	352	180.3
Number of observations	1351	1351	1646	1646

Note: In brackets are heteroskedastic consistent standard errors, * denotes significant at the 5% level, ** at the 10% level.

Table 4c: Effects of European AD-actions on imports

	(1) Heckman Correction for named	*(2) Heckman Correction for non-named*
Step 2:		
Ln (import)$_{t0-1}$	0.63*	0.74*
	(0.02)	(0.01)
Duty *(D)*	-0.37*	0.07
	(0.11)	(0.07)
Undertaking *(U)*	-0.23*	0.17*
	(0.11)	(0.07)
Termination *(T)*	-0.13	-0.03
	(0.11)	(0.07)
Number *(Num)*	0.30*	0.01
	(0.07)	(0.04)
Year dummies	yes	yes
Sector dummies	yes	yes
Step 1:		
Probit:		
Import growth (t_{0-1})	0.07*	-0.13*
	(0.03)	(0.03)
Ln(import)t_{0-2}	-0.30*	0.28*
	(0.01)	(0.01)
Year dummies	yes	yes
Sector dummies	yes	yes
λ	1.04*	-0.91*
	(0.10)	(0.04)
number of observations	2975	2978

Note: In brackets are heteroskedastic consistent standard errors, * denotes significant at the 5% level, ** at the 10% level.

Table 5: Effects in Highly Concentrated versus Lowly Concentrated Sectors

	(1) High C5 OLS	(2) High C5 Robust	(3) Low C5 OLS	(4) Low C5 Robust
Ln (import)$_{t0-1}$	0.68*	0.79*	0.81*	0.88*
	(0.08)	(0.01)	(0.05)	(0.01)
Duty *(D)*	0.14	0.27**	0.05	-0.01
	(0.17)	(0.15)	(0.12)	(0.07)
Undertaking *(U)*	0.33	0.34*	-0.03	-0.09
	(0.24)	(0.15)	(0.13)	(0.08)
Termination *(T)*	-0.13	-0.09	0.09	0.02
	(0.19)	(0.15)	(0.16)	(0.08)
Duty x Named *(DxN)*	-0.87*	-0.88*	-0.56*	-0.17*
	(0.19)	(0.19)	(0.21)	(0.09)
Undertaking x Named *(UxN)*	-0.68*	-0.52*	-0.30**	-0.23*
	(0.21)	(0.20)	(0.20)	(0.10)
Termination x Named *(TxN)*	-0.24	-0.27*	-0.27	-0.09
	(0.21)	(0.20)	(0.23)	(0.09)
Number *(Num)*	0.26	0.10	0.01	0.07
	(0.20)	(0.09)	(0.13)	(0.04)
Number x Named *(NumxN)*	0.54*	0.50*	0.09	0.04
	(0.18)	(0.13)	(0.12)	(0.04)
Named *(N)*	-0.46*	-0.43*	-0.20	-0.20
	(0.18)	(0.16)	(0.16)	(0.07)
Year dummies	yes	yes	yes	yes
Sector dummies	yes	yes	yes	yes
F	80.67	131.8	130.9	222.02
R^2	0.69	-	0.76	-

Note: In brackets are heteroskedastic consistent standard errors, * denotes significant at the 5% level, ** at the 10% level.