

Antidumping Policy. Promoting or Deterring Trade in Mexico?

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ABSTRACT

This paper presents for the first time empirical evidence of the effect of antidumping duties on Mexican trade of imports. Using a rich purpose-built dataset based on the 8 digit level tariff codes identified for 24 antidumping cases investigated during 1994-1998 I examine the trade patterns of investigated and non-investigated imports. Particular attention is given to the market structure of the domestic industry, which in 19 of the cases is characterized as highly concentrated and with investigated imports being the major competitor of the domestic petitioners. Results show that the imposition of duties have restrictive effects on the value and volume of investigated imports. Surprisingly, no significant effect is found for unit values. Trade diversion is found to occur as the impact of duties is insignificant or positive for non-investigated imports.

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1. Introduction

According to the World Trade Organisation (WTO) dumping occurs when the price of an exported good is lower than the home market price of that good. In other words, exports are sold at an unfair value in the importing country because their price is lower than the price that consumers pay for the same good in the exporting country. Article VI of the General Agreement on Trade and Tariffs (GATT) allow country members to levy duties on dumped imports under three conditions to be satisfied altogether: i) dumping exists (dumping margin); ii) the domestic industry is suffering material injury, is threatened of material injury or its establishment is materially retarded because of imports; iii) there is a causal relationship between the two.

Reduction of import tariffs by trade liberalisation has made the use of anti-dumping (AD) and countervailing duties (CVD) the last resort for protection against import competition. These measures, on the one hand, are considered as obstacles to access the potential market generated by the establishment of free trade agreements. On the other hand, they are offered as a instrument to make up for the competitive losses that governmental grants and price discrimination generate in the importing country's affected industry. By imposing duties, the price of imports is increased and its volume restrained. Concerns on the increasing use of AD measures, however, go beyond this protectionist effect².

Although empirical studies of AD have not been in short supply, the study of the effects of AD action from developing economies is still scarce. Because AD measures affect product-specific imports, data on the line-item tariff codes is needed for an accurate analysis of the direct effect of the policy. Most of the rich country based studies of AD, however, use industry rather than product-specific data, and rather look at the motives or factors that lead to the filing of the petition and its outcome. More recently, few studies have focused on the trade restrictive effects of AD measures by using product-specific data³.

Different outcomes arise from the imposition of AD measures. Trade restrictions sought by the importing country can be achieved simply by the filing of the AD petition, for the threat of the imposition of duties being sufficient and duties need not to be levied. This is known as the investigation effect (Staiger and Wolak, 1994). The increase on the volume of non-investigated imports, which are not affected by duties because they come from an alternative source to the target country, may offset the trade restrictions aimed by AD action; this trade diversion is known to be large for US imports (Prusa, 1994). Collusive effects between domestic and foreign firms may arise with the withdrawal of the petition (Prusa, 1992; Zanardi, 2000) or when the threat of AD action serves as a punishment mechanism to sustain a collusive agreement (Staiger and Wolak, 1989; Mendieta, 2004). As for the study of AD in Mexico, there are only two studies that have deeply addressed the issue. They look at the motives for the filing of AD petitions. The

² See below. For other type of measures such as vertical export restraints (VERs) see, for instance, Anderson (1992).

³ See below.

results show evidence of the protectionist use of AD based on macroeconomic and political factors, i.e. exchange rate variations, existence of trade agreements, political clout of the domestic industry (Niels, 2002; Esquivel, 2002).

The aim of this paper is to give a closer account of the effects of AD duties on imports of Mexico investigated for unfair trade practice, i.e. dumping. I analyse the patterns of the volume, value and unit value of imports. The empirical analysis here developed also intends to investigate on the occurrence of alternative effects such as the investigation effect, trade diversion and collusion. By this I also intend to fill the gaps in literature providing with empirical evidence of the effects of AD duties from a developing country's perspective, which is also an active user of AD measures.

Two main features of this paper differentiate it from previous related work. One is the use of a ample purpose built database that not only incorporates product-specific import data (at 8-digit level of SIC code) but also variables that characterise the competitive structure of the domestic petitioner such as domestic output share, number of firms in the industry, number of petitioner firms and share of investigated imports. These variables have proved to be important determinants of the filing of AD investigations as well as their outcome. Henceforth, they are expected to affect the pattern of imports. The other feature of the paper is the use of a different estimation method that suits the characteristics of limited cross-sectional time-series data⁴.

Following in the paper I briefly review in the next section the previous literature on the empirical analysis of the effects of AD measures. Section 3 describes the general features of Mexican AD investigations as reported in the official reports of the authority. Section 4 presents an institutional and a basic theoretical⁵ framework on which the empirical estimation is based. In section 5 I set the conditions for the empirical specification and section 6 present the results. The paper finishes with few concluding comments in section 7.

2. Related literature

Previous work on the estimation of the effects of AD measures has not been in short supply. Most of them, however, are based on aggregated data that does not give an accurate account of the direct effects of AD action, given that duties are imposed at the lowest level of aggregation and are country-specific⁶. Only few papers present a more direct account of the effects of AD measures on the trade of imports and prices. Furthermore, difficulties on the collection of disaggregated data make the number of developing countries-based studies limited.

Prusa (1996) use annual imports data taken from official AD reports in the US. Based on the line-item tariff codes identified for each case, the paper examines the trade patterns of both investigated and non-investigated imports. Using a pooled OLS estimation of the value of imports that include the size of the duties imposed, he finds

⁴ Because observations of the dependent variable take the value of zero in certain periods, a tobit model is the best approach to follow. This is further developed below.

⁵ The basic theoretical framework builds on Prusa (1994).

⁶ See Hartigan, et.al. (1989), Harrison (1992), Bloningen and Park (2001). See also Finger (1981), Herander and Schwartz (1984), Knetter and Prusa (2000), Zanardi (2000), Niels (2001), for the empirical analysis of the determinants of petition filing.

that AD duties substantially restrict trade from investigated countries and the larger the duty the greater the trade restriction. Negative outcomes of the investigation (i.e. no duty) still have important restrictive trade effects. Substantial trade diversion from investigated to non-investigated imports is also found and this is large enough to offset the protection offered to domestic petitioners by AD policy. The author also finds evidence of the use of AD law for motives different from injurious pricing by foreign competitors.

Krupp and Pollard (1992) use disaggregated monthly data to examine the effect of AD measures in the US chemical industry. They show evidence of the restrictive effect of AD duties although this response was not necessarily the same for all products in the sample. Nevertheless, these results shortly extend in to a general trade pattern as it is based on only one specific industry.

Also using monthly product-specific data, Taylor (2001) analyse the effect of AD and countervailing duty cases in the US. The paper is particularly concerned about changes in quantity and price of imports of withdrawn cases only and results show that the vast majority of cases in the sample period observed an increase or no change in the amount of trade. According to the author, this gives little support to hypothesis of collusive outcomes of withdrawn cases.

Although these papers incorporate disaggregated data that allows for a more specific estimation of the direct effect of AD measures in trade, none of them control for other factors that are determinant in the outcome of the investigations and ultimately affect the trade patterns. OLS estimation techniques may also offer inefficient estimation results given the cross-sectional time-series characteristics of the data. In this paper I intend to produce more accurate estimations of the effect of AD measures by incorporating a more ample set of variables as well as applying a different estimation method. A description of the general features of Mexican AD investigations is given first in next section where particular attention is given to the competitive structure of the industries involved in AD cases.

3. General Features of Mexican AD Investigations

During the period 1994-1998, a total of 24 AD cases were investigated by the Unit of International Commercial Practices (UPCI, in Spanish) of the Ministry of the Economy in Mexico. These investigations involve a total of 68 products⁷. The outcome of the investigations is reported in three different stages. Each stage is published as a 'resolution' in the Official Journal (Diario Oficial). A specific dataset that picks up the main features of each case has been constructed from the respective resolutions, namely Initial Resolution, Preliminary Resolution and Final Resolution⁸. Table 1 describes the characteristics of the investigations.

During the period of reference, 54.1% of the cases belong to the chemical and the steel manufacturing sectors (6 and 7 cases, respectively); 20.8% to the food sector (5 cases); 8.3% to other manufactures (2 cases); 8.3% to plastics (2 cases) and one case to the rubber and paper sectors each. The number in parenthesis in column 1 represents the number of products involved in each investigated industry. This is, AD duties are claimed

⁷ Imports are identified at their 8-digit level of the Standard Industrial Classification code.

⁸ The resolutions can be downloaded from the Ministry of the Economy's webpage <http://www.economia.gob.mx>.

for specific products, at 8-digit level, which are sometimes investigated under a more generic tariff classification.

The US accounts for 11 of the 24 cases investigated during the period. China follows with 3 cases. The rest of the involved countries account each for only one case. There are 3 cases that involve more than one country (*prams and pushchairs, hot-rolled steel plate and cold-rolled steel sheet*). As for the products involved, the US represents over 70% of all 68 products of the 24 investigations. Most of them are imports of seamless line pipe and beef (33 out of 48 US products). Brazil follows with 3 products in one case and China with 4 different products in three cases. The rest of cases involve one or two products in each investigation.

Price discrimination happens to be the only reason for the filing of the AD petition (column 7) and only one anti-subsidy petition was filed at the same time for imports of *tinned sliced peaches* from Greece⁹. This somehow, leaves aside the claim of dumped imports at sales below costs, a recurrent argument by AD advocates, at least for this period of reference. If no dumping margin or harm to the domestic industry is found at the Publication of the Preliminary resolution, the authority terminates the investigation. For instance, only 4 out of the 23 *seamless pipe line* imports from US resulted in a positive preliminary outcome. Thus, only these products will continue to be investigated.

Being US the major trade partner of Mexico it is not surprising that most of the cases are claimed against imports from that country. However, there's the opposite belief that renders unnecessary the existence of AD policy within trade agreements, because contrary to the aims of the agreement, it only creates barriers to trade. Aggressive low-cost exports from China might be a reason for domestic competitors' claims of AD action. In either the case, though, suspicion of motives other than to curb unfair trade practices are not surprising to arise when taking into account the market structure of the domestic industry and market power of the petitioners (see below).

Column 4 shows the outcome of the Final resolution of the investigations. A negative final decision, i.e. no duties imposed, was determined for only 4 cases: *diammonium phosphate, synthetic iron oxide and hydroxide, tinned sliced peaches and petrol additives*. All other cases resulted in the imposition of duties to imports¹⁰. Columns 5 and 6 show the level of final duties and dumping margins calculated in the investigation. Note that when more than one product is involved in one case the reported duty and dumping margin refers to a simple average of all the products involved in the investigation. Most of the figures here represent the percentage difference between the export price and the normal value of the product, but in few cases the nominal difference is reported (*Pork and Gas lighters*) and in other cases the duty is only reported as the deviation from the reference normal value, which makes it impossible, from the information provided in the resolution, to calculate the duty (*ammonium sulphate, polystyrene crystal*). The lowest dumping margin observed is for imports of *paper bond* from US of 18.82% and a final duty of 12.76% (average of all products). The highest dumping margin observed is 2,484% with a final duty of 91.10% to imports of *sulphuric acid* from Japan. It is worthwhile to recall here, that the WTO recommends in its antidumping guidelines a 'lesser duty rule', which means that duties imposed need to be

⁹ However, only the antidumping results are considered here.

¹⁰ As mentioned before, withdrawal or out of court settlements are not observed in Mexico and only one undertaking was observed during the period of reference, which was not sustained by the importer.

at the necessary level that removes the harm caused by the practice of price discrimination and not at the whole amount of the dumping margin. It can be observed that this rule was followed in only 6 of the cases (*sulphuric acid, prams and pushchairs, bond paper, steel connections, hot-rolled steel plates and cold-rolled steel sheet*). In the rest of the cases the duty imposed corresponds to the whole amount of the dumping margin. This suggests a higher distortion caused by AD policy, which, added to the characteristics of the competitive structure of the petitioner industry renders the use of AD policy highly suspicious of competition deterring.

Table 1.1 intends to reflect the competitive structure of the domestic industry, the last column reflecting the degree of foreign competition, if nothing else considered. By looking at the share of investigated imports to national imports, which is in most cases greater than 80%, suggests that the investigated country or group of countries are the main source of imports of the respective product in Mexico, thus, the major foreign competitor in the domestic industry. Although the number of firms in the foreign industry is not known, it is assumed that, because duties are generally imposed to all exports of the respective product from the investigated country, all foreign firms act as a single rival to domestic producers. If one individual firm, however, proves that its export price is not below normal value it will be exempted of the duty.

The cases are marked with letters according to the domestic market share (of output) of the petitioning firms and the number of firms in the industry. Cases marked with an A represent a highly concentrated industry and high market power with petitioners representing 100% of domestic production, i.e. domestic monopoly. Cases marked with a B represent also highly concentrated industries, 1 to 3 firms, and a market share of 70-99% (only one industry within this group have a market share of 100%, *steel plates in coil*). Industries marked with a C are those that, although with a larger number of firms, it is still concentrated (4-9 firms) and petitioners' market share is still over 70%. Surprisingly, 19 out of the 24 AD cases were filed by industries with high levels of concentration and likely to have high market power. As for the rest of the cases, all but one (*sulphuric acid*) belong to the food sector. These industries, marked with a D, are characterised by a large number of firms represented by one or more associations of producers which look after the interests of its members and filed the AD petition.

During the period of reference, the domestic industries that claimed AD action against price discriminated imports have high levels of concentration, as measured by the number of firms, and high levels of market power, as measured by the share in domestic production. These two factors are known facilitators of anticompetitive behaviour, such as competition deterrence and collusion. Furthermore, most of the claims for AD action are against dominant exporters (to the Mexican market) that threaten the market dominance of the domestic petitioners. Thus, at first instance, it seems that AD claims are driven by the protectionist interests of domestic firms that see their market dominance threatened by foreign competition. According to the hypothesis that AD policy aids for the achievement of anticompetitive outcomes, special attention must be paid when the characteristics of the industries involved in AD investigations are likely to produce anticompetitive behaviours. A closer look and an in depth analysis of the likely restrictive effects of AD actions on imports and the influence of industry-structure variables is pursued in the empirical analysis carried out next.

4. Institutional and Theoretical framework

According to Mexican AD legislation a domestic producer, or association or trade organisation of domestic producers will file an AD petition if it suspects that competing imports are sold in the domestic market at less than fair value (LFV). This is, if the foreign firm sells in the domestic market at a price below the price it sells the same product in its home market. LFV can also be a constructed measure of the cost of the foreign exports plus a profit margin. Thus, an AD petition is filed when $P^* < P_F$. P_F is the foreign firm's home price and P^* its export price.

The petition must also be accompanied by the proof of material injury or threat of material injury caused to the domestic industry by imports at LFV. Note that a causal relationship between dumping and material injury must be established in order to grant protection to the domestic industry. Nevertheless, given the discretionary use of AD rules by national authorities or the indicators used to measure injury or even the political bias of their decisions, it is usually not difficult to prove injury. Furthermore, the existence of dumping is a necessary condition to claim AD measures and the Mexican authority carries out both determinations at the same time¹¹. Thus, it is assumed that there exists an exogenous and known probability a of the imposition of duties to imports once a petition is investigated.

The AD investigation is carried out in three different stages. Once the petition is filed, the authority will publish an Initial Resolution accepting the petition and initiating the investigation. Within a designated time period, a Preliminary Resolution is published. This will announce the continuation of the investigation and the imposition of provisional duties or terminate the investigation if there is not enough evidence of dumping margin, material injury or threat of material injury and a causal relationship between them. Preliminary duties, if imposed will be collected by the Ministry of the Treasury.

Finally, a Final Resolution will announce whether a definitive duty is imposed, provisional duties removed or the claim for duties denied. If the determination is positive, a duty equal to the dumping margin is imposed on imports, that is, $d = P_F - P^*$,

At any time between the Preliminary Resolution and the Final Resolution, the foreign firm or its representative, may voluntarily and before the authority commit to increase their price or stop their exports in order to remove the dumping and injury caused. As it has been argued by Prusa (1992)¹², private price undertakings, which result in the withdrawal of the petition, are likely to result in collusion between the foreign and domestic firm. However, private settlements are not allowed in Mexican AD legislation and undertakings are difficult to achieve¹³. Thus, the price increase or quantity restraint agreed by the exporter and only under the authority's approval, if any, will be equivalent to the imposition of a duty ($d = P_F - P^*$).

¹¹ In the US, dumping determination is carried out by the Commerce Department and if it is positive then the International Trade Commission will determine whether material injury or threat of material injury is caused by dumped imports.

¹² See also Zanardi (2000), Tylor (2001).

¹³ Recall that only one out of 24 investigations within the reference period resulted in a price undertaking (*Apples* from the US).

Consequently, the foreign firm is forced to raise its price to $P_F = P_D^* = P_B^* + d$ ¹⁴. However, the firm will only collect P^* and $(q_D \cdot d)$ will be collected by the government as the duty revenue.

Definitive duties can be reviewed by request of any of the parties every one year after the final resolution is published. The review is aimed to evaluate whether the original conditions that generated the imposition of duties have changed. If the foreign firm stopped the dumping practice and harm to the domestic industry has been restored the duty can be removed. If the dumping practice has worsened the duty is adjusted. The review process which, assumes that firms' strategies can influence the final duty outcome, allows for the dynamic feature of AD policy to be incorporated in the empirical specification of the model developed below.

A basic duopoly model is developed to see the effect of the introduction of AD policy in the importing country. Suppose there are two firms that compete in price in the importing market. They face the same constant marginal cost. The foreign firm (*) sets independently the price at which it sells the same exported product in its own market, P_F . This price is assumed to be larger than the export price P^* so that imports are claimed to be dumped. The expected profits of each firm with AD policy are:

$$E\Pi = a\Pi_D(BR(P_F), (P_F - P^*)) + (1-a)\Pi_B(P, P^*) - cq \dots \dots \dots (1)$$

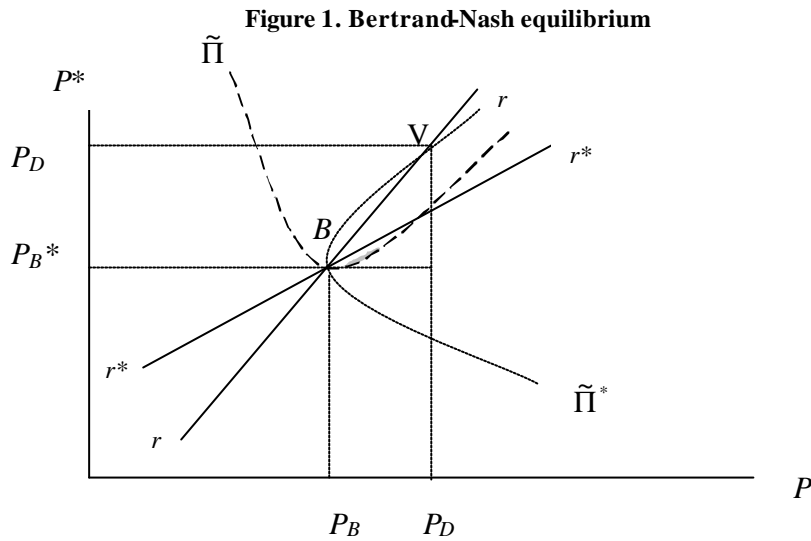
$$E\Pi^* = a\Pi_D^*((P_F - P^*), BR(P_F)) + (1-a)\Pi_B^*(P^*, P) - cq \dots \dots \dots (2)$$

where BR is the best reaction function of a firm that responds to its rival's pricing strategy. AD action ($a=1$) creates a distortion resulting in a price increase by both firms which is however larger for the foreign firm than for the domestic firm. This is because the latter is acting according its best reply function (BR). The quantity reduction is consequently larger for the foreign firm and the domestic firm ends up with a larger market share and higher profits. Consumers face higher prices in the domestic market for both the imported and domestic product (point V in diagram 1). If duties are not imposed expected profits are those under Bertrand-Nash free trade equilibrium, i.e. no AD policy (point B in diagram 1).

To see that $P_D^* < P_B^*$ note that a higher price results in a reduction of the quantity sold such that $q_D^* < q_B^*$; foreign firms collects only P_B^* and the government's duty revenue dq_D^* is subtracted from the firm's profit. Hence, $\Pi_D^*(P_D^*, P_D) - dq_D^* < \Pi_B^*(P_D^*, P_D)$.

To see that $P_D > P_B$ it is enough to note that the domestic firm is acting under its best reply function for any price increase by the foreign firm. Hence, a higher price combination than (P_B^*, P_B) results in greater profits. Likewise, $P_D > P_D^*$.

¹⁴ If a 'lesser duty' is applied prices in the domestic market are matched and the dumping margin $P_F - P_B^*$ is not necessarily eliminated. This will only reduce the size of d without any change in the final outcome, however, the price distortion is smaller.



5. Empirical specification

The focus of this paper is on the effects of AD action on imports trade. The expected effects of the imposition of duties to imports are price increase and volume and volume reductions, as shown in the previous section¹⁵. The larger the duties imposed the larger the price increase and quantity reduction. When duties are small, however, the quantity of imports may not decrease and even grow (Prusa, 1994). In addition, investigation and diversion effects of AD policy are also empirically tested. The restraint of imports caused by the investigation can be as large as the duty effect (Harrison, 1991; Staiger and Wolak, 1994) and diversion can be large enough to offset the imports restraint effect of duties (Prusa, 1996).

Macroeconomic and political factors have shown to be relevant in the determination of filing activity, i.e. number of cases, and the likeliness of positive outcomes. Exchange rate movements influence the price of foreign firms' exports relative to domestic firm's own currency affecting the probability of dumping (Feinberg, 1998) or of injury (Knetter and Prusa, 2000). An appreciation of the real exchange rate in Mexico increases the number of antidumping complaints filed by domestic producers, as shown in Niels (2001)¹⁶. The study also shows the relevance of political factors in the likeliness of the imposition of AD duties. Petitions filed against non-WTO members as well as those filed by large domestic firms are more likely to result in the imposition of duties. Thus, macroeconomic and political factors can in this way affect the trade of imports in the filing country¹⁷.

¹⁵ Value changes will depend however on whether the unit value effect of the volume effect dominates.

¹⁶ An appreciation of the exchange rate will increase the flow of imports and consequently the number of AD petitions. A slowdown in manufacturing activity also proved statistical significance in increases the number of AD petitions. Both factors raise the probability that domestic industries are found to be suffering injury. The latter is not included in this paper due to the unavailability of product-level manufacturing data.

¹⁷ Esquivel (2002) also arrive to similar conclusions in their study of AD measures in Mexico.

The empirical specification to be estimated in this paper considers variables that can both directly and indirectly affect the trade of imports in the domestic country. It builds on the theoretical framework of the previous section and on the outcome of previous empirical work (see section 2). Hence, the basic specification to be estimated is defined as follows:

$$\begin{aligned}
 Y_{it} = & \mathbf{b}_1 + \mathbf{b}_2 IC_i + \mathbf{b}_3 PO_{it} + \mathbf{b}_4 PD_{it} + \mathbf{b}_5 FO_{it} + \mathbf{b}_6 FD_{it} + \mathbf{b}_7 DSHARE_i + \mathbf{b}_8 MSHARE_i + \\
 & \mathbf{b}_9 CONC_i + \mathbf{b}_{10} DSHARE_i^2 + \mathbf{b}_{11} MSHARE_i^2 + \mathbf{b}_{12} INRESO_{it} + \mathbf{b}_{13} PRESO_{it} + \mathbf{b}_{14} FRESO_{it} + \\
 & \mathbf{b}_{15} (DSHARE * FD)_{it} + \mathbf{b}_{16} (MSHARE * FD)_{it} + \mathbf{b}_{17} TA_{it} + \mathbf{b}_{18} RER_t + \mathbf{j}_{it} \dots \dots \dots (1)
 \end{aligned}$$

Y_{it} takes the form of value, volume and unit value for each series of investigated and non-investigated imports of Mexico. Therefore, six equations will be estimated (with three different specifications for each equation). Characteristics of the variables follow below.

Given the nature of the data -a panel data has been constructed- $\mathbf{j}_{it} = \mathbf{e}_i + \mathbf{m}_{it}$ imply that the error term of equation (1) is a combination of the individual-specific (cross-sectional) error component and the combined cross-section time series error component¹⁸. In contrast with previous OLS estimations of the effect of AD measures, the nature of the rich panel data collected here allows for a more consistent estimation method. Equation (1) is estimated using a random effects tobit model. The main intuition for using a random effects (RE) estimation is that the sample products's individual characteristics are randomly drawn from a large population, total imports of Mexico, which is subject to AD policy¹⁹. The use of a tobit estimation allows for the account of limited dependent variables, that is, the dependent variable takes the value of zero for some observations within the sample period (Green, 2000). The dependent variable is transformed for a straightforward interpretation of the estimated coefficients, i.e. elasticities. Rather than taking the logarithm, however, variables are transformed to the Box-Cox equivalent. By using this transformation negative values are avoided when taking the logarithm of zero values (Green, 2000).

5.1 The Data

Monthly series of the value of imports and the volume of imports for the period 1992-2002 of each product were collected from the Ministry of the Economy. With these, a series of the unit value of imports was constructed. Each series is divided into two sub-series, one of investigated imports, that is, those imports claimed by the domestic petitioners to be traded under unfair practices, i.e. dumping, and one of non-investigated imports, that is, all other imports of the same product that compete in the domestic market. This makes up to a total of six series of AD imports.

Information about the relevant factors of the investigations that may affect the pattern of imports is taken from the official resolutions published by the authority. Particular focus is put on the market structure of the petitioning firms. The number of firms in the industry and the number of firms filing the petition and their domestic output

¹⁸ See below.

¹⁹ See Gujarati (2003).

share are used as indicators of the concentration level of the industry and market power, respectively. The level of foreign competition in the domestic industry, given by the share of investigated imports to total imports of the same product is also picked up (as shown above). These indicators are considered here as factors that may contribute to a larger distortion by AD policy as reflected by the restriction of imports²⁰. Variables to control for macroeconomic and political factors are also incorporated in the empirical estimation, which, as mentioned before, have an indirect effect on the trade of imports through the outcome of the investigation. Out of the 68 products involved in the investigations, six were deleted due to incomplete information. Henceforth, a panel of 8,184 pooled observations is constructed for each series of value, volume and unit value of imports of Mexico.

Next, grouped according to the characteristics of the information obtained from the official resolutions is a list of the exogenous variables. The cross-section variation is denoted by $i=1, \dots, 62$ (products) and the time series by $t=1, \dots, 132$ (months).

? Outcome variables

Preliminary duty: (PD_{it}) is the (percentage) size of the duty levied as a result of the preliminary finding of dumping. It may take the value of zero if no preliminary duty is yet determined or once the final duty is known. It is expected to reduce the volume of imports and raise the unit value of imports. Similarly, the value of imports is expected to decrease. Nevertheless, the sign of this variable may be ambiguous depending upon whether the price or volume effect is more dominant.

Final duty: (FD_{it}) is the (percentage) size of the duty levied as a result of the final finding of dumping. It may take the value of zero if no final duty is yet determined or once the duty expires (five years later). It is expected to reduce the volume of imports and raise the unit value of imports. Note that according to point c above, when the final duty is small the effect on the volume of imports may be positive, which could lead to the existence of collusive behaviour. Similarly, the value of imports is expected to decrease. Nevertheless, the sign of this variable may be ambiguous depending upon whether the price or volume effect is more dominant.

Preliminary outcome: (PO_{it}) is a dichotomous variable; =1 if positive (duties imposed) and =0 otherwise. Equivalent to the size of the duty, the expected sign is negative for the volume of imports and value of imports and positive for the unit value.

Final Outcome: (FO_{it}) is a dichotomous variable; =1 if positive (duties imposed) and =0 otherwise. Equivalent to the size of the duty, the expected sign is negative for the volume of imports and value of imports and positive for the unit value.

Number of investigated countries: (IC_i) is a dichotomous variable; =1 when more than one target country and =0 otherwise. This variable intends to pick up on the trade

²⁰ The studies of AD in Mexico referred before draw some information from the official reports, nevertheless, they do not pick up on neither the market structure of the domestic industry nor the timing of the imposition of duties, nor the size of the duty as neither of the related studies have done.

diversion effect (non-investigated imports). The expected sign is positive, for an increase of imports when more than one country is related to the investigation.

? Competitive structure

Despite the indirect (protectionist) effect that these three variables have on the trade of imports through the outcome of the investigation, as indicated in Niels (2001), a direct effect is looked at here²¹.

Domestic share of petitioners: (DSHARE_i) is an indicator of petitioner's market power. The expected relationship is positive, for the demand for imports in the domestic market is greater the greater the output reduction by the domestic petitioner. Similarly, higher domestic prices may attract imports of lower prices, thus, expecting a negative relationship with unit values. However, when looking at the potential anticompetitive effects, a reduction of imports is expected if a collusive agreement is in place (negative sign) and unit values are expected to rise (positive).

Concentration level of domestic industry: (CONC_i) is an indicator of the concentration level of the domestic industry. This is not necessarily correlated with the previous variable as it can be the case that only one firm out of three supplies most of the market. If concentration is high, it may be the case that the output reduction increases the domestic demand for imports, thus, a positive sign is expected. However, it may also be the case that the concentration level is the result of an efficient configuration of the industry, thus, domestic demand is cleared by the industry and imports are expected to be low (negative sign).

Share of investigated imports: (MSHARE_i) is considered as a degree of competition in the domestic market posed by the target country. A high share means that most imports are supplied by the target country, thus, a positive sign is expected. The anti-competitive implication here is that the higher the share the less foreign competition in the domestic market, which can lead to collusive agreements reflected in a rise of unit values or volume restriction, thus, a negative sign is expected.

? Macroeconomic factors

Real exchange rate: (RER_t) is taken from the reports by the Mexican Central Bank as monthly index and included to control for macroeconomic factors. An appreciation of the real exchange rate will increase imports, thus, a negative sign is expected.

Trade partnership: (TA_{it}) is a dichotomous variable that picks up on the trade relationship between Mexico and the target country; =1 if trade agreement, and =0 otherwise. Imports are expected to be more significant from trade partners, thus a positive sign is expected.

? Time dummies

²¹ Note however, that Niels (2001) uses industry data (4-digit) rather than the information here drawn from the official reports.

Initial resolution: (INRESO_{it}) is a time dummy variable; =1 for the months from the initiation of the resolution up to the publication of the preliminary resolution, and =0 otherwise. Negative expected sign.

Preliminary resolution: (PRESO_{it}) is a time dummy variable; =1 for the months from the publication of the preliminary resolution up to the publication of the final resolution, and =0 otherwise. Negative expected sign.

Final resolution: (FRESO_{it}) is a time dummy variable; =1 for the months from the publication of the final resolution up to the end of the period or the expiration of the duty five years after its imposition (sunset clause), and =0 otherwise. Negative expected sign.

Table 2 summarizes the descriptive statistics of each variable's series.

A first analysis of the effect of AD duties in the trade of imports can be developed by looking at the mean values of the dependent variable during the period of study. Tables 3-5 report the mean values of the volume, value and unit value of imports of selected investigated products from each investigation²². Mean values are calculated for the twelve months before the initiation of the investigation (B), for the months during the investigation process up to the publication of the final resolution (D), and for the twelve months after the publication of the final resolution (A). The percentage change from one period to the other (D/B and A/D) shows the change in import flows of investigated imports when AD action is in process and is compared to imports of the same products that are not subject to AD measures (d/b and a/b).

Mean values of the volume of investigated and non-investigated imports are shown in Table 3. Volume restriction of investigated imports is observed for most of the cases in the period when the investigation is carried out (D/B). Sixteen out of twenty three cases reported in the table show a volume decrease during this period. The restraint of investigated imports is compared with the trend of non-investigated imports. Here, only ten cases show a decrease in the volume of imports (d/b). Once the final outcome of the investigation is published, more than a half of investigated cases show a decrease in imported volumes for the twelve subsequent months (A/D). As for non-investigated imports, only nine cases show a decrease in volume (a/d). Table 4 shows mean values for the value of both investigated and non-investigated imports. A general decrease in the value of investigated imports is also observed during the period of investigation (seventeen cases). On the other hand, only less than half of non-investigated cases show a decrease in the value of imports. Similarly, fifteen investigated cases show a decrease of the value of imports as compared with less than half of non-investigated cases showing a decrease for the twelve months after the publication of the final outcome.

The restrictive effects of duties observed in the previous two tables are supported by Table 5. A positive sign in this case represents an increase in the unit price of imports, as calculated by the division of the value by the volume of imports. More than half of the investigated cases show an increase of unit price during the period of investigation. On

²² The value and unit value of imports are reported at constant USD of 1980 using a general index of imports in USD (www.banxico.gob).

the other hand, only seven cases of non-investigated imports showed a price increase during the period of investigation. For the twelve months period after the final outcome only eight investigated cases resulted in a price increase, while, surprisingly, more non-investigated cases showed a price rise in the same period.

The mean values presented in tables 3-9 7 through 9 give preliminary evidence of the trade restriction caused by the use of AD measures. General volume and value decrease as well as unit price rise of investigated imports during the months of investigation suggest that the threat of imposition of duties is sufficient to curb foreign competition by the trade protection claimed by petitioners. This preliminary result is in support of previous evidence of investigation effects (Staiger and Wolak, 1994; Prusa, 1996; Harrison, 1991). There is also preliminary evidence of the greater effect of AD action to investigated imports as compared to non-investigated in both the period of investigation and the twelve months period after the final outcome. It's worth mentioning here that although non-investigated imports are just marginal imports, with a small share in national imports (of the respective product) in many cases, the response of leading imports to AD action is much greater. This is similar to the evidence shown in Prusa (1996) where the effect of AD on investigated imports is greater than the effect on non-investigated imports.

The previous analysis suggests that AD measures in Mexico have a restrictive effect on the trade of imports reducing their volume and value and raising unit prices. This restriction can be achieved with the initiation of the investigation and the threat of imposition of duties is sufficient to restrain imports even though final duties are not imposed (e.g. *petrol additives* and *tinned sliced peaches*). Nevertheless, this analysis does not control for other factors determinant in the magnitude and direction of this effects. Different from previous related studies, particular attention is given on the competitive structure of the industry were control variables for domestic market share an industry concentration are considered. Similarly, I focus on the different stages of the investigation and the respective outcome, including the change in the size of duties from one stage to another. Macroeconomic and political factors are also incorporated in the analysis to be consistent with previous results of the determinants of the determinants of AD actions.

6. Estimation Results

Tables 6-8 present random effects tobit estimates of equation (1). Three different specifications were estimated for each series of volume, value and unit value of both investigated and non-investigated imports. Specification 1 includes all variables expected to have effect on the pattern of imports and considers the timing effect of the duty, i.e. preliminary and final, as well as of the investigation, i.e. initial, preliminary, final resolution. Since the share of investigated imports to total imports can be a determinant of the outcome of the investigation through the injury test, multicollinearity it is likely to exist between the two variables, therefore specification 2 and 3 do not include the variables related to the share of imports. The latter considers the duty as one variable along the whole period and also incorporates the lagged effect of the dependent variable to control for late adjustments to the investigation's outcomes.

The number of investigated countries (*ic*)²³ is significant for both investigated and non-investigated imports in specification 1 for all but the unit value estimation. The sign is positive and the effect is greater for non-investigated imports. This is the same result found in Pusa (1996) where diversion increases with the number of countries. Ambiguous results arise for this variable in specifications 2 and 3, where cumulation may be an issue that deserves further attention²⁴.

The imposition of preliminary and final duty (*pd* and *fd*, respectively) have a restrictive effect on the value of imports in specification 1 with a greater restriction by *fd*. Surprisingly, duties result insignificant on the volume of investigated imports, although signs are negative. Duties are not significant for non-investigated imports on neither the volume nor the value of imports. This might occur because either non investigated import are not affected in the same scale by AD action or more generally because of the marginal participation of non-investigated imports in total imports. However, the announcement of a positive final outcome (*fo*) can be restrictive enough. Surprisingly too, the effect of duties on the unit value of imports is not significant for both investigated and non-investigated imports. In specification 2, all outcome variables are significant for both volume and value of investigated and non-investigated imports. This again is not the case for the unit value. The imposition of duties reduces the volume and value of investigated imports. This reduction is around 1.7 and 2.3 percent. Non-investigated imports are only affected by the imposition of final duties but contrarily to investigated imports, their value and volume increase by a much greater amount than the reduction of the latter, around 4.3-6.8 percent. This is strong evidence of the existence of trade diversion which offsets the restrictive effect of AD action on investigated imports. When accounting for the whole duty effect (*td*) in specification 3, the coefficient is not significant for any of the estimations of investigated imports. An increase of the value and volume of imports results however for non-investigated products. This, again supports the trade diversion hypothesis.

Interestingly, all competitive structure variables have a significant effect on the pattern of imports. Domestic output (*dshare*) and imports shares (*mshare*) have a negative effect on imports in all the estimations in specification 1. The restriction is greater for the volume and value of non-investigated imports whereas it is smaller for the unit value. This result can be explained in two ways. One is that imports decrease when domestic output share of petitioner increases because there is less demand of imports as market is supplied domestically. Another explanation is that as output share or imports share increase, the finding of domestic injury is more likely. Therefore, imports will decrease as a reaction or anticipation to the likely positive outcome. Imports are also affected by the concentration variables (*f1*, *f2*, *f3* with *f4* as the benchmark case) and the impact is mostly negative in all estimations. The combined effect of output share and duty (*dsharefd*) is significant only for non-investigated imports. Similarly for (*msharefd*). Note that signs are opposites with an increase on price of non-investigated imports and a price decrease of investigated imports. However, it is not clear why the impact of the competitive structure variables is greater and significant for non-investigated imports.

Time dummies for each stage of the investigation (*inreso*, *preso*, *freso*) show ambiguous results. *Inreso* is not significant mostly, which means that there is no actual

²³ Subscripts are removed from variables in this section for easier reading.

²⁴ See Prusa (1998) for instance.

impact on imports when the petition has just been filed. A significant increase of unit value result from the publication of preliminary and final outcomes, this might be in anticipation of the imposition of duties so that they are not levied. A general increase of the volume and value of imports is also observed in all estimations resulting from the preliminary and final stages of the investigation. There is a significant decrease of the volume and value of investigated imports during the twelve months after the final duty is known (12affd). Interestingly, the impact of this variable is a fall in the price. This variable is not significant for any estimation of non-investigated imports.

The effect of the real exchange rate and the existence of a trade agreement between Mexico and the investigated country are mostly not significant having they more important effect on the determination of the outcome of the investigations²⁵ of a lag of the dependent variable is significant and positive in all of the estimations.

Finally, the lagged value of the dependent variable introduced in specification 3 is significant and positive implying an increase in the value, volume and price of imports one period just after the realisation of the AD action.

7. Concluding comments

In this paper I have intended to analyse for the first time in Mexico the effect of AD duties on imports. An important data base has been constructed that picks up on the characteristics of the investigations including information from each of the different stages of the investigation process. Information such as the size of the preliminary and final duties and the timing of the investigation is combined with information about the competitive structure of the industry that files the AD petition. The number of firms in the industry, the number of petitioners, output share of petitioners and share of investigated imports as an indicator of foreign competition are incorporated in the empirical estimation of the value volume and unit value of imports affected by AD policy. Based on results of previous empirical estimation of the effects of Ad measures on imports three different specifications were estimated. One where all relevant variables are introduced, one where variables expected to have multicollinearity with outcome variables were eliminated and one where a lag of the dependent variable was introduced to account for late changes of the realisation of AD action.

Results show that preliminary duties and final duties have a restrictive effect on the value of imports when all variables are considered and the effect is greater for the final duty. Surprisingly, no duty effect is found for neither the volume nor the unit value of investigated imports. The effect is also insignificant for non-investigated imports. When the share of imports is not included in the specification, the duty effect is significant for all but unit values of imports. The restriction is around 1.7-2.3 percent. For non-investigated imports, on the other hand, the effect is positive and greater, around 4.3-6.8 percent. Output share and imports share are significant for the all variables model. The effect is surprisingly greater for non-investigated imports. The combined effect of shares with duties is also significant only for non-investigated imports. The reason for this effect is however unclear. Timing variables of the investigation process have significant effect on imports, showing a price rise as well as an increase in volume and value. Interestingly, results show a significant decrease of the volume and value during

²⁵ See Niels (2001) and Esquivel (2002).

the twelve months after the final duty announcement and a price decrease for investigated imports. Model three, which picks up the effect of the duty as a whole along the period resulted not significant. Macro variables are mostly not significant. The significance of the lagged dependent variable shows that changes in the pattern of imports occur one period after AD action is imposed.

Although here I have just developed a preliminary analysis of the effect of AD duties in Mexican imports, some of the results are consistent with previous literature. Further development of this analysis is needed, however, to get a deeper insight of the estimation results and methodology.

References

- Anderson, James E. (1992), "Domino dumping I: competitive exporters", *American Economic Review*, 82, 65-83.
- Barcelo III, John J. (1991), "A history of GATT unfair trade remedy law: confusion of purposes", *World Economy*, 14, p. 311-333.
- Blonigen, Bruce A., and Prusa, Thomas, J., (2001). "Antidumping", NBER working paper, no. w8398.
- Brander, James and Krugman, Paul (1983), "A reciprocal dumping model of international trade", *Journal of International Economics*, 15, 313-321.
- Clarida, Richard (1993), "Entry, dumping and shakeout", *American Economic Review*, 83, pp. 180-202.
- Dale, Richard (1980), Antidumping law in a liberal trade order, Macmillan, Trade Policy Research Centre.
- Davies, Stephen and McGuinness, Anthony (1982), "Dumping at less than marginal cost", *Journal of International Economics*, 12, 169-182.
- Esquivel, Gerardo and Solis, Mario, (2002), "Antidumping Practices in Mexico", El Colegio de Mexico, unpublished.
- Ethier, Wilfred (1982), "Dumping", *Journal of Political Economy*, 90, 481-506.
- Ethier, Wilfred and Fischer, Ronald D. (1987), "The new protectionism", *Journal of International Economic Integration*, 2, p.1-11.
- Evenett, Simon J. (2003), "The failure of the WTO Ministerial meeting in Cancun: What implications for future research on the world trading system?", *forthcoming in CESifo Forum*, volume 4, no. 3, Autumn, pp. 11-17.
- Finger, J. Michael, ed. (1993), *Antidumping. How it Works and Who Gets Hurt*, The University of Michigan Press.
- Finger, Michael, Hall, Keith and Nelson, Douglas (1982), "The political economy of administered protection", *American Economic Review*, 72, 452-466.
- Fischer, Ronald D. (1992), "Endogenous probability of protection and firm behaviour", *Journal of International Economics*, 32, p.149-163
- Green, William H., (2000), Econometric Analysis, Prentice Hall.
- Gujarati, N. Damodar, (2003), *Basic Econometrics*, McGraw Hill.
- Hartigan, James C. (1994), "Dumping and signaling", *Journal of Economic Behaviour and Organization*, 23.
- Horlick, Gary N. and Shea, Eleanor (1995), "The World Trade Organisation Antidumping Agreement", *Journal of World Trade*, 29, p. 5-31.
- Leidy, Michael P. and Hoekman, Bernard M. (1990), "Production effects of price- and cost-based antidumping laws under flexible exchange rates", *Canadian Journal of Economics*, 23, 873-95.
- Levenstein, Margaret, et.al. (2003), "International price-fixing cartels and developing countries: a discussion of effects and policy remedies", Working paper 53, University of Massachusetts, Amherst.
- López-Ayllón, Sergio and Vega Canovas, Gustavo (eds) (2001). Unfair trade practices in the commercial integration process of the Americas: North- America and Chile experiences, UNAM-SECOFI, Mexico America and Chile experiences, UNAM-SECOFI, Mexico.

- Messerlin, A. Patrick, (1990). "Antidumping regulations or pro-cartel law? The EC Chemical cases", *The World Economy*, vol. 13, pp. 465-492.
- Miranda, Jorge, et. Al. (1998), "The international use of antidumping 1987-1997", *Journal of World Trade*, 32, pp. 5- 71.
- Niels, Gunnar (2001), "Antidumping", Doctoral thesis, mimeo.
- Panagariya, Arvind and Gupta, Poonam (1998), "Antidumping versus price negotiations", *The World Economy*, 33, pp. 1-20.
- Prusa, Thomas J. and Skeath, Susan, (2000), "On the Spread and Impact of Antidumping", NBER Working Paper no. 7404.
- Prusa, Thomas J., (1992). "Why are so many antidumping petitions withdrawn?", *Journal of International Economics*, no. 33, pp. 1-20.
- Prusa, Thomas J., (1994), "Pricing Behavior in the Presence of Antidumping Law", *Journal of Economic Integration*, 9, 260-289.
- Staiger, Robert W. and Wolak, Frank A., (1994), "Measuring Industry Specific Protection: Antidumping in the United States", *Brookings Papers on Economic Activity: Microeconomics*, 51-118.
- Staiger, W. Robert and Wolak, A. Frank, (1989). "Strategic use of antidumping law to enforce tacit international collusion", NBER working paper no.3016.
- Taylor, Christopher T., (2001). "The economic effects of withdrawn antidumping investigations: is there evidence of collusive settlements", Federal Trade Commission, working paper, August.
- Veugelers, Reinhilde and Vandebussche, Hyke, (1999). "European antidumping policy and the profitability of national and international collusion", *European Economic Review*, 43, pp.1-28.
- Viner, J., (1923). *Dumping: a problem in international trade*. University of Chicago Press, Chicago.
- Zanardi, Maurizio, (2000). "Antidumping law as a collusive device", Boston College Working paper, November.
- Zanardi, Maurizio, (2002). "Antidumping: What are the numbers?", University of Glasgow, Working Paper.

| Table 1. Main features of AD cases, 1994-1998 (continues...) | | | | | | | |
|--|---|--------------------------|-----------------------------|-------------------|---|------------------------------|---|
| no. case | Type of industry (no. of 8-digit level products involved) (1) | Manufacturing sector (2) | Country of origin (3) | Final outcome (4) | Final duty (%) (5) | Final dumping margin (%) (6) | Reason for investigation (7) |
| 1 | steel connections (1) | steel | Brazil | positive | 99.1% (average) | 176.00% | price discrimination |
| 2 | Cold-rolled steel sheet (2) | steel | Bulgaria, Kazakstan, Russia | positive | 54.78% (average) | 139% (average) | price discrimination |
| 3 | Furazolidone (1) | chemical | China | positive | 117.00% | 117.00% | price discrimination |
| 4 | Gas lighters (1) | other manufactures | China | positive | 0.1232US\$ per unit | 0.1232US\$ per unit | price discrimination |
| 5 | door knobs (2) | steel | China | positive | 236% | 236.00% | price discrimination |
| 6 | prams and pushchairs (3) | other manufactures | China, Taiwan | positive | 53.03% (average) | 64.22% (average) | price discrimination |
| 7 | polystyrene crystal (2) | plastics | EU | positive | difference between NV (US\$0.927) and X price | 58.73% | price discrimination |
| 8 | tinned sliced peaches (1) | food | Greece | negative | 0.00% | 0.00% | price discrimination and anti-subsidies |
| 9 | Bicycle tyres (1) | rubber | India | positive | 116.00% | 116.00% | price discrimination |
| 10 | sulphuric acid (1) | chemical | Japan | positive | 91.10% | 2484% | price discrimination |
| 11 | Steel plates in coil (2) | steel | Russia | positive | 29.30% | 29.30% | price discrimination |
| 12 | hot rolled steel plate (2) | steel | Russia, Ukraine | positive | 55.69% (average) | 58.69% (average) | price discrimination |

Table 1. Main features of AD cases, 1994-1998 (finishes)

| no. case | Type of industry (no. of 8-digit level products involved) (1) | Manufacturing sector (2) | Country of origin (3) | Final outcome (4) | Final duty (%) (5) | Final dumping margin (%) (6) | Reason for investigation (7) |
|----------|---|--------------------------|-----------------------|-------------------|---------------------------------------|------------------------------|------------------------------|
| 13 | Carbon steel balls (1) | steel | Taiwan | positive | 19.44% | 19.44% | price discrimination |
| 14 | diammonium phosphate (1) | chemical | USA | negative | 0% | 0% | price discrimination |
| 15 | Ammonium sulphate (1) | chemical | USA | positive | dif between NV (97.18USD) and X price | 57.91% | price discrimination |
| 16 | petrol additives (3) | chemical | USA | positive | 81.00% | 81.00% | price discrimination |
| 17 | synthetic iron oxide and hydroxide (2) | chemical | USA | negative | 0.00% | 0.00% | price discrimination |
| 18 | High fructose [corn syrup] (4) | food | USA | positive | n.a | n.a | price discrimination |
| 19 | apples (1) | food | USA | positive | 46.58% | 46.58% | price discrimination |
| 20 | beef (10) | food | USA | positive | 28.93% | 28.93% | price discrimination |
| 21 | Pork (1) | food | USA | positive | 0.351USD | 48.13% | price discrimination |
| 22 | Bond paper (1) | paper | USA | positive | 12.76% (average) | 18.82% (average) | price discrimination |
| 23 | regenerated celluloid film (1) | plastics | USA | positive | 30.60% | 30.60% | price discrimination |
| 24 | seamless line pipe (23) | steel | USA | positive | 82.41% | 82.41% | price discrimination |

Table 1.1. Competitive structure of AD cases.

| (sector)Industry | No. of firms in the domestic industry | No. of petitioners | Domestic market share (%) | AD imports share to national imports (%) |
|---|---------------------------------------|-----------------------------|---------------------------|--|
| | | | >70 | >60 |
| (chemical)Diammonium phosphate | 1* A | 1 | 100 | 99.70 |
| (steel)Carbon steel balls | 1 A | 1 | 100 | 98.30 |
| (chemical)Furazolidone | 1 A | 1 | 100 | 97 |
| (paper)Bond paper | 9** C | 8 | 100 | 97 |
| (plastics)Celluloid film | 1 A | 1 | 100 | 99 |
| (food)High fructose | 61*** | 59 | 98 | 99.80 |
| (chemical)Iron oxide/hydroxide | 2 B | 1 | 95 | 82 |
| (plastics)Polystyrene crystal | 3 B | 2 | 90 | 96 |
| (food)Tinned peaches | 6 C | 1 | 90 | 65 |
| (chemical)Ammonium sulphate | 5 C | 3 | 71 | 89 |
| (steel)Steel connections | 1 A | 1 | 100 | 86 |
| | | | >70 | n.a. |
| (chemical)Petrol additives | 6 C | 1 | 80 | n.a. |
| (other manuf.)Gas lighters | 1 A | 1 | 100 | n.a. |
| (food)Pork | n.a. D | 1(association of producers) | <70 68 | >60 100 |
| (food)Apples | n.a. D | | 60 | 83 |
| (chemical)Sulphuric acid | 13 D | 2 | 45 | 71 |
| Rest | | | | <70 |
| (steel)Seamless line pipe | 1 A | 1 | 100 | 58 |
| (steel)Plates in coil | 3 B | 3 | 100 | 41 |
| (steel)Hot-rolled plate | 1 A | 1 | 100 | 49 |
| (rubber)Bicycle tyres | 3 B | 1 | 92 | 27 |
| (other manuf.) Prams&pushchairs | n.a. | 1 | 90 | 11.30-36 |
| (steel)Door knobs | 3 B | 1 | 80 | 29 |
| (steel)Cold-rolled sheet | 3 B | 2 | 71 | 31 |
| (food)Beef | n.a D | 1(association of producers) | 90-100 | 67-100 |
| | | | | |
| <p>Note: Different values are calculated for the <i>Beef</i> case, where 6 out of 10 products have a domestic share of 90-100% and imports' share is over 67.2 for all its products. *Divested to 4 firms after privatisation. **Of which 4 firms are owned by one firm. A: domestic market share of 100; 1-3 firms B: domestic market share of 70-99; 1-3 firms C: domestic market share > 70; 3-9 firms D: domestic market share < 70; 9+ firms</p> | | | | |

| Table 2. Descriptive statistics of variables. | | | | | |
|--|------|-----------|-----------|---------|--------|
| Variable | Obs | Mean | Std. Dev. | Min | Max |
| value investigated1/ | 6670 | 794490.2 | 3278018 | 0 | 53,100 |
| value non-investigated1/ | 7392 | 418288.3 | 1072299 | 0 | 10,600 |
| volume investigated2/ | 6660 | 763938.5 | 2699881 | 0 | 51,500 |
| volume non-investigated2/ | 7378 | 1037358 | 3770871 | 0 | 56,200 |
| unit value investigated1/ | 6692 | 9.863068 | 56.41796 | 0 | 1.884 |
| unit value non-investigated1/ | 7384 | 5.269678 | 40.96208 | 0 | 1.293 |
| ic (=1 for more than one country investigated and 0 otherwise) | 7788 | 0.1016949 | 0.3022661 | 0 | 1 |
| po (=1 when publication of preliminary resolution in place and 0 otherwise) | 7788 | 0.038906 | 0.1933834 | 0 | 1 |
| pd (size of preliminary duty in %) | 7788 | 3.043626 | 19.3485 | 0 | 236 |
| fo (=1 when publication of final resolution in place and 0 otherwise) | 7788 | 0.1950437 | 0.3962598 | 0 | 1 |
| fd (size of final duty in %) | 7788 | 13.98896 | 38.06684 | 0 | 236 |
| dshare (petitioner's output share to total domestic output in %) | 7788 | 89.44034 | 17.32937 | 39.6 | 100 |
| mshare (investigated import's share to total imports in %) | 7788 | 68.30508 | 21.22699 | 27 | 100 |
| f1 (=1 if one firm in domestic industry and 0 otherwise) | 7788 | 0.5084746 | 0.4999603 | 0 | 1 |
| f2 (=1 if two to three firms in domestic industry and 0 otherwise) | 7788 | 0.1864407 | 0.3894869 | 0 | 1 |
| f3 (=1 if four to fifteen firms in domestic industry and 0 otherwise) | 7788 | 0.1016949 | 0.3022661 | 0 | 1 |
| f4 (=1 if more than fifteen firms in domestic industry and 0 otherwise) | 7788 | 0.2033898 | 0.4025459 | 0 | 1 |
| inreso (=1 for 12 months previous to initial resolution and 0 otherwise) | 7788 | 0.0649718 | 0.2464918 | 0 | 1 |
| preso (=1 for months of investigation up to final resolution and 0 otherwise) | 7788 | 0.0789676 | 0.2697056 | 0 | 1 |
| freso (=1 for months after final resolution up to end of period and 0 otherwise) | 7788 | 0.3891885 | 0.4875975 | 0 | 1 |
| _12be (=1 for 12 months previous to initial resolution and 0 otherwise) | 7788 | 0.0909091 | 0.2874982 | 0 | 1 |
| _12af (=1 for 12 months after final resolution and 0 otherwise) | 7788 | 0.0900103 | 0.2862149 | 0 | 1 |
| rer (index of real exchange rate) | 7788 | 81.59887 | 16.607 | 55.7411 | 138.31 |
| ta (=1 if trade agreement with investigated country and 0 otherwise) | 7788 | 0.5939908 | 0.4911178 | 0 | 1 |

1/Thousands of USD
2/Thousands of Units

Table 3. Mean values. AD investigations. Volume of imports.

| Volume of Imports | | | | | | | | | | | |
|---------------------------|--------------|--------------|-----------|-----------|---------|---------|------------------|-----------|-----------|----------|------------|
| Product | Sector | Investigated | | | | | non-investigated | | | | |
| | | B | D | A | D/B | A/D | b | d | a | d/b | a/d |
| | | mean | | | %change | | mean | | | %change | |
| Diammonium phosphate | chemical | 17,258.22 | 3,069.93 | 11,249.76 | -82.21 | 266.45 | 8.64 | 0.29 | 0.54 | -96.70 | 90.38 |
| Furazolidone | chemical | 2.11 | 0.59 | 0.00 | -71.86 | -100.00 | 0.63 | 1.39 | 3.01 | 122.87 | 115.94 |
| Iron oxide/hydroxide (19) | chemical | 238.12 | 378.97 | 504.30 | 59.15 | 33.07 | 15.84 | 14.81 | 45.65 | -6.49 | 208.14 |
| Ammonium sulphate | chemical | 1,609.63 | 257.26 | 192.56 | -84.02 | -25.15 | 11.02 | 3.76 | 15,032.49 | -65.87 | 399,505.39 |
| Petrol additives (25) | chemical | 15.24 | 8.83 | 5.04 | -42.09 | -42.87 | 0.09 | 0.16 | 0.40 | 76.06 | 151.97 |
| Sulphuric acid | chemical | 7,443.05 | 2,108.62 | 0.07 | -71.67 | -100.00 | 6,756.79 | 5,213.48 | 18,110.63 | -22.84 | 247.38 |
| High fructose (14) | food | 3,049.23 | 560.87 | 580.33 | -81.61 | 3.47 | 0.01 | 0.16 | 0.09 | 1,823.53 | -43.79 |
| Tinned peaches | food | 835.85 | 248.10 | 502.19 | -70.32 | 102.42 | 511.07 | 1,227.10 | 2,283.77 | 140.10 | 86.11 |
| Apples | food | 7,835.30 | 10,018.40 | 10,750.05 | 27.86 | 7.30 | 78.85 | 2,411.58 | 3,648.46 | 2,958.31 | 51.29 |
| Pork | food | 9.95 | 24.02 | 3.95 | 141.50 | -83.53 | 0.00 | 0.01 | 0.36 | - | 2,357.85 |
| Gas lighters | other manuf. | 966.31 | 55.02 | 67.41 | -94.31 | 22.50 | 1,858.72 | 2,981.86 | 2,804.26 | 60.43 | -5.96 |
| Prams&pushchairs (69) | other manuf. | 93.93 | 28.80 | 31.15 | -69.34 | 8.15 | 30.54 | 11.71 | 8.83 | -61.66 | -24.62 |
| Bond paper | paper | 2,401.01 | 2,404.26 | 1,618.66 | 0.14 | -32.68 | 73.53 | 302.86 | 1,251.81 | 311.91 | 313.34 |
| Polyestyrene crystal (27) | plastics | 445.52 | 1.67 | 1.46 | -99.63 | -12.42 | 311.75 | 380.07 | 283.73 | 21.92 | -25.35 |
| Celluloid film | plastics | 101.76 | 68.71 | 76.71 | -32.48 | 11.64 | 16.56 | 8.01 | 11.62 | -51.63 | 45.04 |
| Bicycle tyres | rubber | 346.46 | 180.66 | 2.91 | -47.86 | -98.39 | 581.86 | 314.13 | 343.88 | -46.01 | 9.47 |
| Carbon steel balls | steel | 12.44 | 3.93 | 5.79 | -68.38 | 47.28 | 77.17 | 72.50 | 89.92 | -6.06 | 24.03 |
| Door knobs (66) | steel | 12.38 | 15.21 | 5.65 | 22.87 | -62.83 | 51.00 | 113.12 | 78.60 | 121.82 | -30.52 |
| Seamless line pipe (44) | steel | 34.35 | 46.61 | 53.00 | 35.71 | 13.71 | 166.82 | 102.52 | 68.10 | -38.55 | -33.57 |
| Steel Connections (64) | steel | 7.73 | 1.58 | 0.00 | -79.60 | -99.94 | 146.72 | 157.31 | 133.63 | 7.21 | -15.05 |
| Plates in Coil (36) | steel | 4,068.92 | 780.52 | 0.00 | -80.82 | -100.00 | 8,920.81 | 1,138.08 | 0.00 | -87.24 | -100.00 |
| Hot-rolled plate (37) | steel | 2,603.19 | 2,526.38 | 1,045.73 | -2.95 | -58.61 | 10,143.75 | 17,476.10 | 9,270.33 | 72.28 | -46.95 |
| Cold-rolled sheet (39) | steel | 844.58 | 1,416.62 | 4.64 | 67.73 | -99.67 | 5,983.28 | 6,459.57 | 7,647.02 | 7.96 | 18.38 |

Table 4. Mean values. AD investigations. Value of imports.

| Value of Imports | | | | | | | | | | | |
|---------------------------|--------------|--------------|----------|----------|---------|---------|------------------|----------|----------|----------|-----------|
| Product | Sector | Investigated | | | | | non-investigated | | | | |
| | | B | D | A | D/B | A/D | b | d | a | d/b | a/d |
| | | mean | mean | Mean | %change | | mean | mean | mean | %change | |
| Diammonium phosphate | chemical | 1,734.27 | 415.45 | 1,682.33 | -76.04 | 304.94 | 8.03 | 16.99 | 0.00 | 111.45 | -99.99 |
| Furazolidone | chemical | 11.73 | 3.32 | 0.00 | -71.67 | -100.00 | 3.49 | 8.11 | 13.29 | 132.41 | 63.85 |
| Iron oxide/hydroxide (19) | chemical | 153.16 | 166.16 | 173.34 | 8.49 | 4.32 | 30.79 | 24.69 | 53.25 | -19.83 | 115.70 |
| Ammonium sulphate | chemical | 78.51 | 22.72 | 19.85 | -71.07 | -12.64 | 2.69 | 1.14 | 622.91 | -57.47 | 54,338.46 |
| Petrol additives (25) | chemical | 28.66 | 16.17 | 7.10 | -43.59 | -56.07 | 0.39 | 0.52 | 0.75 | 33.17 | 42.82 |
| Sulphuric acid | chemical | 28.63 | 16.43 | 0.37 | -42.60 | -97.74 | 228.77 | 265.16 | 413.20 | 15.91 | 55.83 |
| High fructose (14) | food | 446.25 | 93.32 | 85.50 | -79.09 | -8.38 | 0.15 | 0.32 | 0.15 | 105.60 | -52.15 |
| Tinned peaches | food | 369.11 | 120.33 | 274.30 | -67.40 | 127.96 | 316.71 | 741.44 | 1,313.56 | 134.11 | 77.16 |
| Apples | food | 2,600.31 | 5,071.57 | 6,126.19 | 95.04 | 20.79 | 28.61 | 1,028.05 | 1,571.22 | 3,493.76 | 52.84 |
| Pork | food | 392.41 | 1,044.89 | 223.73 | 166.27 | -78.59 | 0.00 | 0.59 | 19.03 | - | 3,104.52 |
| Gas lighters | other manuf. | 15.04 | 0.53 | 4.47 | -96.46 | 739.72 | 288.44 | 352.22 | 308.29 | 22.11 | -12.47 |
| Prams&pushchairs (69) | other manuf. | 105.70 | 144.20 | 178.01 | 36.43 | 23.45 | 103.25 | 94.28 | 92.70 | -8.69 | -1.67 |
| Bond paper | paper | 1,555.23 | 1,709.50 | 1,309.67 | 9.92 | -23.39 | 96.09 | 282.33 | 751.01 | 193.83 | 166.00 |
| Polystyrene crystal (27) | plastics | 191.17 | 1.85 | 0.96 | -99.03 | -48.42 | 375.09 | 305.30 | 220.67 | -18.61 | -27.72 |
| Celluloid film | plastics | 269.20 | 152.53 | 146.68 | -43.34 | -3.84 | 39.87 | 21.33 | 28.43 | -46.49 | 33.24 |
| Bicycle tyres | rubber | 210.18 | 117.77 | 3.13 | -43.96 | -97.34 | 725.51 | 367.19 | 366.06 | -49.39 | -0.31 |
| Carbon steel balls | steel | 15.32 | 3.60 | 8.06 | -76.53 | 123.95 | 614.96 | 517.91 | 468.65 | -15.78 | -9.51 |
| Door knobs (66) | steel | 34.78 | 33.82 | 3.58 | -2.78 | -89.40 | 427.87 | 846.74 | 600.09 | 97.90 | -29.13 |
| Seamless line pipe (44) | steel | 62.76 | 54.97 | 84.81 | -12.41 | 54.29 | 182.76 | 103.18 | 87.34 | -43.54 | -15.35 |
| Steel Connections (64) | steel | 8.63 | 2.05 | 0.01 | -76.18 | -99.70 | 102.59 | 97.06 | 140.05 | -5.40 | 44.29 |
| Plates in Coil (36) | steel | 831.87 | 161.43 | 0.00 | -80.59 | -100.00 | 2,155.84 | 311.53 | 0.00 | -85.55 | -100.00 |
| Hot-rolled plate (37) | steel | 670.02 | 666.66 | 257.44 | -0.50 | -61.38 | 3,676.91 | 5,385.83 | 2,723.38 | 46.48 | -49.43 |
| Cold-rolled sheet (39) | steel | 222.80 | 365.26 | 1.22 | 63.94 | -99.67 | 2,017.99 | 2,315.47 | 2,551.27 | 14.74 | 10.18 |

Table 5. Mean values. AD investigations. Unit Value of imports.

| Unit Value of Imports | | | | | | | | | | | |
|---------------------------|--------------|--------------|-------|-------|----------|---------|------------------|-------|-------|---------|---------|
| Product | Sector | Investigated | | | | | non-investigated | | | | |
| | | B | D | A | D/B | A/D | b | d | a | d/b | a/d |
| | | mean | mean | Mean | %change | | mean | mean | mean | %change | |
| Diammonium phosphate | chemical | 0.12 | 0.14 | 0.16 | 21.48 | 12.49 | 3.34 | 1.20 | 2.15 | -64.18 | 80.01 |
| Furazolidone | chemical | 2.64 | 1.71 | 0.00 | -35.31 | -100.00 | 1.39 | 2.25 | 4.33 | 61.10 | 93.02 |
| Iron oxide/hydroxide (19) | chemical | 0.65 | 0.45 | 0.34 | -30.21 | -24.16 | 2.59 | 2.58 | 1.56 | -0.21 | -39.35 |
| Ammonium sulphate | chemical | 0.09 | 4.58 | 0.10 | 5,023.64 | -97.82 | 1.27 | 1.63 | 2.30 | 27.84 | 41.64 |
| Petrol additives (25) | chemical | 1.90 | 2.11 | 1.72 | 11.00 | -18.38 | 5.45 | 3.18 | 2.37 | -41.57 | -25.52 |
| Sulphuric acid | chemical | 2.60 | 3.02 | 2.84 | 15.88 | -5.96 | 0.06 | 0.09 | 0.04 | 38.92 | -55.24 |
| High fructose (14) | food | 0.18 | 1.10 | 0.87 | 512.89 | -20.34 | 3.74 | 1.96 | 0.45 | -47.63 | -76.88 |
| Tinned peaches | food | 0.45 | 0.26 | 0.55 | -42.62 | 115.34 | 0.61 | 0.61 | 0.56 | -0.66 | -8.58 |
| Apples | food | 0.34 | 0.49 | 0.58 | 42.64 | 18.61 | 0.20 | 0.37 | 0.45 | 85.83 | 20.06 |
| Pork | food | 44.18 | 45.80 | 27.54 | 3.67 | -39.87 | 0.00 | 3.14 | 25.59 | - | 714.61 |
| Gas lighters | other manuf. | 0.14 | 0.11 | 0.15 | -17.10 | 29.08 | 0.18 | 0.12 | 0.11 | -35.96 | -6.79 |
| Prams&pushchairs (69) | other manuf. | 3.13 | 5.82 | 7.04 | 86.32 | 20.89 | 6.41 | 11.07 | 11.24 | 72.64 | 1.58 |
| Bond paper | paper | 0.65 | 0.74 | 0.86 | 13.35 | 15.81 | 1.36 | 1.19 | 0.61 | -13.11 | -48.18 |
| Polyethylene crystal (27) | plastics | 0.27 | 0.25 | 0.05 | -6.44 | -78.34 | 1.07 | 0.80 | 0.80 | -24.90 | -0.44 |
| Celluloid film | plastics | 2.63 | 2.24 | 1.97 | -14.74 | -12.37 | 4.08 | 2.28 | 5.74 | -44.02 | 151.12 |
| Bicycle tyres | rubber | 0.62 | 0.69 | 0.43 | 12.98 | -38.01 | 1.28 | 1.18 | 1.10 | -8.16 | -7.16 |
| Carbon steel balls | steel | 1.08 | 1.36 | 1.52 | 25.44 | 12.23 | 8.03 | 7.76 | 5.47 | -3.33 | -29.58 |
| Door knobs (66) | steel | 2.69 | 3.42 | 0.58 | 27.27 | -83.09 | 8.13 | 7.62 | 7.90 | -6.30 | 3.67 |
| Seamless line pipe (44) | steel | 1.99 | 1.39 | 1.75 | -30.14 | 25.91 | 1.24 | 1.52 | 1.57 | 22.24 | 3.24 |
| Steel Connections (64) | steel | 1.12 | 1.15 | 0.52 | 2.81 | -54.95 | 0.78 | 0.66 | 1.26 | -14.38 | 89.96 |
| Plates in Coil (36) | steel | 0.17 | 0.15 | 0.00 | -16.65 | -100.00 | 0.24 | 0.23 | 0.00 | -7.04 | -100.00 |
| Hot-rolled plate (37) | steel | 0.26 | 0.30 | 0.24 | 14.77 | -19.52 | 0.38 | 0.32 | 0.31 | -15.67 | -4.58 |
| Cold-rolled sheet (39) | steel | 0.24 | 0.21 | 0.04 | -12.33 | -79.87 | 0.34 | 0.37 | 0.34 | 9.44 | -7.91 |

| Variable | Investigated M | | | Non-investigated M | | |
|-----------------------|-----------------------|------------------------|---------------------|-----------------------|-----------------------|---------------------|
| | (1) | (2) | (3) | (1) | (2) | (3) |
| ic | 4.333* (0.586) | 0.757 (0.581) | 0.821 (0.562) | 16.322* (0.712) | 7.006* (0.719) | - |
| po | 15.567 (8.633) | 25.699* (8.539) | | 0.655 (9.038) | -0.959 (9.149) | |
| pd [^] | -1.092 (0.500) | -1.681* (0.494) | | -0.014 (0.560) | 0.103 (0.567) | |
| fo | 6.425 (6.575) | 16.111* (5.365) | | -30.844* (5.868) | -7.888 (5.323) | |
| fd [^] | -1.015 (1.215) | -2.003* (0.954) | | -0.395 (1.282) | 6.795* (1.132) | |
| dshare [^] | -410.762* (53.427) | -1038.371* (51,213) | -67.339 (45.609) | -732.320* (60.199) | -303.697* (55.003) | - |
| mshare [^] | -134.277* (25.014) | | | -249.192* (24.152) | | |
| f1 | -15.390* (0.592) | -14.085* (0.512) | -8.915* (0.600) | 0.104 (0.717) | 1.174 (0.643) | - |
| f2 | -16.377* (0.620) | -5.779* (0.538) | -5.162* (0.588) | 1.437 (0.776) | 8.987* (0.662) | 1.160* (0.576) |
| f3 | -3.529* (0.488) | 1.244* (0.460) | 1.413* (0.423) | 7.460* (0.649) | 9.922* (0.609) | 2.363* (0.459) |
| dshare2 [^] | 149.209* (19.164) | 372.007* (18.366) | 24.883 (16.358) | 249.636* (20.705) | 102.693* (18.918) | 74.786* (0.195) |
| mshare2 [^] | 47.576* (9.007) | | | 86.027* (8.352) | | |
| dsharefd [^] | -0.034 (0.620) | 0.401 (0.615) | | -3.900* (0.686) | -4.288* (0.702) | |
| msharefd [^] | 0.138 (0.583) | | | 5.492* (0.508) | | |
| _12affo | 25.536* (9.600) | 24.856* (9.448) | 12.426 (7.864) | 4.486 (9.409) | 5.605 (9.430) | 3.095 (7.814) |
| _12affd [^] | -1.451* (0.561) | -1.392* (0.552) | | -0.177 (0.592) | -0.243 (0.593) | |
| inreso | n.s. | 0.886 (0.497) | 0.035 (0.431) | n.s. | - | 1.266* (0.540) |
| preso | 1.104 (0.632) | 0.897 (0.672) | 1.136* (0.485) | 4.490* (0.836) | 4.242* (0.843) | 2.822* (0.596) |
| freso | 2.264* (0.383) | 2.361* (0.411) | 0.741* (0.352) | 2.589* (0.508) | 1.768* (0.508) | 1.280* (0.429) |
| _12be | 2.442* (0.424) | 2.539* (0.424) | 1.119* (0.368) | 0.797 (0.534) | 1.093* (0.538) | 0.834 (0.458) |
| _12af | 0.765 (0.642) | 0.364 (0.644) | 0.555 (0.548) | 1.148 (0.837) | 1.417 (0.844) | 0.894 (0.697) |
| td [^] | | | 0.854 (0.755) | | | 2.230* (0.907) |
| td2 [^] | | | -0.231 (0.184) | | | 0.277 (0.230) |
| dsharetd [^] | | | -0.516 (0.503) | | | -1.814* (0.568) |
| msharetd [^] | | | | | | |
| _12aftd [^] | | | -0.751 (0.460) | | | -0.148 (0.491) |
| rer [^] | | 1.072* (0.493) | 0.515 (0.427) | -7.128* (0.589) | -7.738* (0.589) | -3.647* (0.514) |
| ta | | 0.116 (0.317) | 0.186 (0.287) | -3.918* (0.391) | -3.169* (0.379) | -1.811* (0.364) |
| v-1 [^] | | | 0.596* (0.012) | | | 0.673* (0.012) |
| _constant | 337.632* (44.309) | 673.336* (38.441) | 35.250 (32.134) | 848.45* (56.054) | 324.082* (46.687) | 206.763* (7.008) |
| sigma_u | 9.532* (0.140) | 6.151* (0.091) | 3.885* (0.140) | 8.513* (0.115) | 9.738* (0.201) | 4.999* (0.251) |
| sigma_c | 9.729* (0.095) | 9.552* (0.093) | 8.214* (0.080) | 11.983* (0.123) | 12.080* (0.124) | 10.081* (0.103) |

*denotes significance at the 5% level and ** 1% level; standard errors in parenthesis. [^]Box-Cox transformed variables. n.s. not included as turned out to be insignificant.- not reported in output.

| Variable | Investigated M | | | Non-investigated M | | |
|-----------------------|------------------------|-----------------------|------------------------|------------------------|------------------------|-----------------------|
| | (1) | (2) | (3) | (1) | (2) | (3) |
| ic | 2.664* (0.5723) | n.s. | n.s. | 22.133* (0.6825) | 16.110* (0.6534) | 7.759* (0.6872) |
| po | 24.851* (7.5110) | 32.565* (7.5305) | | 3.588 (8.9385) | -1.778 (9.1202) | |
| pd [^] | -1.777* (0.4696) | -2.290* (0.4710) | | -0.217 (0.5545) | 0.206 (0.5656) | |
| fo | 8.395 (5.6904) | 16.396* (4.6368) | | -26.319* (5.7642) | 8.911 (5.3110) | |
| fd [^] | -2.313* (1.1404) | -2.085* (0.9139) | | -1.042 (1.2680) | 4.331* (1.1034) | |
| dshare [^] | -310.811* (44.8088) | 109.249* (42.1775) | -124.992* (31.8430) | -319.519* (57.6403) | -281.041* (55.0073) | -251.613* (50.307) |
| mshare [^] | -155.179* (21.2086) | | | -272.766* (23.5972) | | |
| f1 | -17.170* (0.5740) | -15.865* (0.4699) | - | 0.917 (0.6979) | -3.781* (0.6020) | -3.581* (0.6916) |
| f2 | -17.981* (0.6011) | -10.976* (0.4651) | -5.528* (0.3320) | -3.768* (0.7441) | 1.944* (0.6312) | -2.269* (0.6958) |
| f3 | -5.159* (0.4785) | -5.497* (0.4414) | - | 10.479* (0.6458) | 2.403* (0.5997) | -6.535* (0.6707) |
| dshare2 [^] | 107.606* (15.4195) | 109.249* (14.5115) | 43.202* (10.9571) | 107.872* (19.8331) | 96.134* (18.9188) | 85.644* (17.2866) |
| mshare2 [^] | 53.396* (7.3333) | | | 94.285* (8.1574) | | |
| dsharefd [^] | 0.804 (0.5725) | 0.373 (0.5639) | | -3.759* (0.6781) | -3.330* (0.6843) | |
| msharefd [^] | 0.099 (0.5188) | | | 5.579* (0.4998) | | |
| _12affo | 26.336* (8.3643) | 25.680* (8.3776) | 0.242 (1.0898) | 3.490 (9.2620) | 0.674 (9.4100) | 2.779 (7.8109) |
| _12affd [^] | -1.666* (0.5289) | -1.612* (0.5299) | - | -0.113 (0.5826) | 0.059 (0.5919) | |
| inreso | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| preso | 0.570 (0.6140) | 0.684 (0.6136) | 1.130* (0.4540) | 4.453* (0.8248) | 4.068* (0.840) | 2.657* (0.5880) |
| freso | 1.576* (0.3825) | 1.862* (0.3669) | 0.512 (0.3409) | 2.805* (0.5019) | 1.358* (0.5035) | 1.066* (0.4224) |
| _12be | 2.148* (0.4148) | 2.148* (0.4163) | 0.967* (0.3515) | 0.738 (0.5278) | 1.066* (0.5374) | 0.591 (0.4532) |
| _12af | 0.960 (0.6272) | 0.856 (0.6277) | 0.776 (0.5247) | 1.458 (0.8242) | 1.865* (0.8385) | 0.978 (0.7003) |
| td [^] | | | 0.876 (0.6892) | | | 2.217* (0.8660) |
| td2 [^] | | | -0.176 (0.2652) | | | 0.085 (0.1942) |
| dsharet [^] | | | -0.543 (0.4768) | | | -1.617* (0.5575) |
| msharet [^] | | | | | | |
| _12aftd [^] | | | -0.022 (0.0172) | | | -0.132 (0.4914) |
| rer [^] | n.s. | n.s. | n.s. | -6.723* (0.5810) | -7.190* (0.5872) | -3.427* (0.5077) |
| ta | n.s. | n.s. | n.s. | -4.827* (0.3857) | -3.621* (0.3785) | -2.285* (0.3479) |
| v-1 [^] | | | 0.611* (0.0124) | | | 0.661* (0.0136) |
| _constant | 324.528* (41.3968) | 201.817* (35.1333) | 106.238* (25.009) | 531.259* (54.4389) | 288.387* (46.5388) | 236.438* (40.2061) |
| sigma_u | 8.631* (0.1216) | 8.876* (0.1301) | 4.439* (0.1584) | 7.974* (0.1279) | 11.020* (0.1422) | 5.054* (0.1849) |
| sigma_c | 9.504* (0.934) | 9.527* (0.0936) | 8.029* (0.0791) | 11.842* (0.1219) | 12.070* (0.1243) | 10.134* (0.1040) |

*denotes significance at the 5% level and ** 1% level; standard errors in parenthesis. [^]Box-Cox transformed variables. n.s. not included as turned out to be insignificant.

| Variable | Investigated M | | | Non-investigated M | | |
|-----------------------|---------------------|--------------------|--------------------|---------------------|--------------------|--------------------|
| | (1) | (2) | (3) | (1) | (2) | (3) |
| ic | -0.059 (0.116) | -2.063* (0.132) | -0.517* (0.123) | 0.109 (0.123) | -0.368* (0.118) | 0.010 (0.126) |
| po | 0.740 (0.516) | 0.656 (0.562) | | 0.029 (0.436) | 0.125 (0.435) | |
| pd [^] | -0.081 (0.042) | -0.072 (0.046) | | -0.012 (0.029) | -0.026 (0.029) | |
| fo | 0.647 (0.380) | -0.296 (-0.344) | | -0.301 (0.279) | 0.345 (0.249) | |
| fd [^] | -0.113 (0.100) | -0.068 (0.093) | | -0.067 (0.065) | 0.097 (0.060) | |
| dshare [^] | -11.657* (1.296) | -4071* (1.186) | -1.022 (1.102) | -6.096* (0.625) | -3.050* (0.595) | -3.044* (0.604) |
| mshare [^] | -11.236* (0.554) | | | -7.567* (0.321) | | |
| f1 | -3.282* (0.120) | -3.130* (0.105) | -2.817* (0.115) | -1.528* (0.153) | -1.448* (0.136) | -1.946* (0.144) |
| f2 | -4.174* (0.121) | -2.395* (0.117) | -3.268* (0.127) | -2.590* (0.156) | -1.688* (0.124) | -1.355* (0.126) |
| f3 | -1.250* (0.098) | -1.648* (0.097) | -1.776* (0.099) | 0.129 (0.112) | -0.820* (0.107) | -0.478* (0.106) |
| dshare2 [^] | 1.764* (0.185) | 0.713* (0.169) | 0.196 (0.157) | 0.631* 0.061 | 0.326* (0.056) | 0.314* (0.057) |
| mshare2 [^] | 1.620* (0.079) | | | 0.726* (0.030) | | |
| dsharefd [^] | 0.026 (0.021) | 0.011 (0.022) | | -0.013 (0.009) | -0.026* (0.009) | |
| msharefd [^] | -0.018 (0.017) | | | 0.029* (0.006) | | |
| _12affo | 0.570 (0.564) | 1.211* (0.617) | 0.968 (0.544) | 0.402 (0.443) | 0.365 (0.443) | 0.414 (0.405) |
| _12affd [^] | -0.094* (0.049) | -0.140* (0.053) | | -0.001 (0.031) | 0.002 (0.031) | |
| preso | -0.163 (0.125) | -0.107 (0.136) | 0.073 (0.104) | 0.542* (0.152) | 0.541* (0.151) | 0.546* (0.121) |
| freso | -0.111 (0.075) | -0.038 (0.080) | -0.062 (0.074) | 0.101 (0.093) | 0.191* (0.092) | 0.171* (0.088) |
| _12be | 0.121 (0.085) | 0.180* (0.138) | 0.103 (0.086) | 0.111 (0.095) | 0.125 (0.195) | 0.119 (0.092) |
| _12af | 0.311* (0.126) | 0.316* (0.138) | 0.234 (0.128) | 0.199 (0.149) | 0.190 (0.148) | 0.190 (0.142) |
| td [^] | | | -0.079 (0.080) | | | 0.089 (0.056) |
| td2 [^] | | | -0.000 (0.007) | | | -0.004 (0.002) |
| dsharetd [^] | | | 0.012 (0.019) | | | -0.014 (0.008) |
| msharetd [^] | | | | | | |
| _12aftd [^] | | | -0.113* (0.047) | | | -0.013 (0.029) |
| rer [^] | | | | -0.077* (0.026) | -0.081* (0.026) | -0.78* (0.025) |
| ta | | | | -0.719* (-0.070) | -0.609* (0.068) | -0.628* (0.069) |
| v-1 [^] | | | 0.359* (0.013) | | | 0.312* (0.014) |
| _constant | 62.997* (4.188) | 6.996* (3.518) | 1.954 (3.212) | 53.453* (3.475) | 11.829* (2.626) | 12.452* (2.619) |
| sigma_u | 2.027* (0.240) | 2.154* (0.026) | 1.370* (0.035) | 1.730* (0.041) | 1.489* (0.031) | 1.154* (0.036) |
| sigma_e | 1.912* (0.018) | 2.096* (0.020) | 1.961* (0.018) | 2.087* (0.210) | 2.081* (0.212) | 2.010* (0.020) |

*denotes significance at the 5% level and ** 1% level; standard errors in parenthesis. [^]Box-Cox transformed variables. n.s. not included as turned out to be insignificant.

