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► **To cite this version:**

Mustapha Sadni Jallab, René Sandretto, Monnet Benoît Patrick Gbakou. Antidumping Procedures and Macroeconomic Factors: A Comparison between the United States and the European Union. *Global Economy Journal*, 2006, 6 (3), pp.22. halshs-00112311

**HAL Id: halshs-00112311**

**<https://shs.hal.science/halshs-00112311>**

Submitted on 8 Nov 2006

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# *Global Economy Journal*

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*Volume 6, Issue 3*

2006

*Article 5*

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## Antidumping Procedures and Macroeconomic Factors: A Comparison between the United States and the European Union

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# Antidumping Procedures and Macroeconomic Factors: A Comparison between the United States and the European Union\*

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## Abstract

This paper aims at extending some recent publications about the relationship between antidumping filings and macroeconomic factors by comparing the United States (US) and the European Union (EU), two major users of antidumping procedures. Results of our estimations confirm that the exchange rate exerts a similar influence in the two countries. Fluctuations in the real GDP influence antidumping filings only in the US. On the contrary, the evolution of industrial production does not play an important role in the US, while its impact is important in Europe. The reinforcement of international competition appears to significantly increase antidumping filings in the US while this relationship turns out not to be significant in Europe. Finally, some of the most important differences between the US and the EU seem to be explainable by the differences of rules and practices implemented by the regulatory authorities.

**KEYWORDS:** dollar euro exchange rate, antidumping initiations, negative binomial model, unfair trade

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\*We are grateful to Robert Feinberg (American University Washington), William Latham (University of Delaware), Thomas Prusa (Rutgers University, New Brunswick and NBER) and Hylke Vandenbussche (Catholic University of Leuven and CEPR) for their helpful comments and suggestions. We also thank anonymous referees for helpful comments. Any errors are, of course, the sole responsibility of the authors. This paper should be attributed to the authors. It is not meant to represent the position or opinions of the United Nations or its Members, nor the official position of any UN staff member. Corresponding author, Dr. Mustapha Sadni Jallab, Trade and Regional Integration Division, United Nations Economic Commission for Africa, P.O. Box 3001, Addis Ababa, Ethiopia, Phone: 251-1-44-31-78; Fax: 251-1-51-30-38, e-mail: msadni-jallab@uneca.org

## INTRODUCTION

Despite a voluminous literature over the past 20 years on the economic causes and consequences of antidumping policies, both in the U.S. and in other countries, little work has been done on the extent to which patterns of antidumping filings have been driven by macroeconomic phenomena. Basically, three major contributions have been proposed so far: two papers written by R. Feinberg (1989, 2005) and a paper written by Prusa and Knetter (2003). To some extent, the antidumping action looks like “an invitation to a dance”<sup>1</sup>. Indeed, the antidumping procedure is undoubtedly a request for a foreign firm to adjust their price, which would put an end to the case, instead of applying punitive duties. However, the “dance tune” is far from peaceful and harmonious and the request turns out to be rather an injunction or a threat.

Basically, the antidumping procedure is composed of three stages: initiation, investigation and decision. In order to be admissible, a complaint must meet three conditions: (1) Petitioners must be supported by a significant part of the import-competing industry; (2) Petitioners must provide certain information related to the alleged dumping practice, namely the reduction of the import price and the increase in import quantities; (3) The similarity of the good produced by the plaintiffs to the import good. Only those companies which produce a good considered to be sufficiently similar to the alleged dumped import product, are entitled to lodge a complaint. When the preliminary determination of dumping has been made, antidumping measures may be taken. When the final findings have been made and consequent injury to the domestic industry proved, the final antidumping duty may be imposed.

This article is focused exclusively on the first stage. More precisely, our objective is to analyze the influence that macroeconomic factors may exert on the number of initiations. Clearly, our ambition is not to explain antidumping filings. Sectorial or microeconomic factors play obviously a more determining role than macroeconomic factors. Our objective is more specific and limited. Our goal is to analyze if and how macroeconomic factors in general, namely fluctuations in economic growth and real exchange rates or the evolution of import penetration rate affect the opening of new antidumping actions. To this end, we compare the two most important world filers, the United States and European Union during the period 1990-2002. Interest in this comparison stems from the fact that the antidumping procedure combines an international regulation (the WTO antidumping code instituted by article 6 of the GATT and specified by the Tokyo antidumping code and its 1994 revision) and national rules. We suspect that differences in national rules and practices may condition the influence of macroeconomic factors. This investigation draws upon and seeks to provide an extension to these previous publications. In a pioneering study, R. Feinberg (1989) investigated the causes

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<sup>1</sup> We are grateful for the anonymous referee who suggested us this comparison.

of antidumping filings in the US between 1982 and 1987, using a Tobit model. He focused his research on the four countries which are mostly targeted by the US antidumping authorities: Japan, Brazil, Mexico and South Korea. Feinberg established that fluctuations in the real exchange rate are a significant factor in the opening of inquiries, especially for Japan. More precisely, he showed that the increase in antidumping procedures between 1982 and 1987 was significantly related to the weakness of the US dollar. In addition, Feinberg found evidence of a negative impact of growth in GDP on the number of filings. However, the discreet nature of the values taken by the number of openings of inquiries induces us to question the appropriateness of the Tobit method. More recently, Feinberg (2005) used a negative binomial model in order to estimate the determinants of quarterly antidumping petitions in the US between 1981 and 1998. His conclusion was quite different: over this last period, US antidumping filings rose with the appreciation (not the depreciation) of the US dollar. This divergence about the consequences of exchange rate changes is not really surprising in far as the influence of exchange rates on filing behaviour is ambivalent, as underlined by an abundant literature about the exchange rate pass through<sup>2</sup>. Knetter and Prusa (2003) used the same technique (negative binomial model) for four of the most important antidumping users: Australia, Canada, the EU and the US. In Knetter and Prusa, the dependant variable is the number of filings occurring every year between 1980 and 1998. Surprisingly, neither Feinberg nor Knetter and Prusa take into account the possible influence of the import penetration rate. In our opinion, this macroeconomic variable must be considered for at least three reasons:

- First, an increase in the rate of import penetration means (or can be perceived to mean) more rigorous foreign competition.
- Second, the proof of material injury requires evidence that the industry has experienced a sharp increase in imports.
- Third, the new WTO antidumping code reinforces the obligation for the reporting country to establish a causal relationship between the dumped imports and the damage suffered by the complainant industry.

Furthermore, earlier studies neglected the impact of the designated period used to evaluate the damage.

The article is organized as follows. The second section describes the data, the variables and their relations. A brief presentation of the model used is also discussed. The third section presents and interprets our results. A final section summarizes our main conclusions.

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<sup>2</sup> The pass through describes how firms adjust the price (denoted in the importing country currency) of the goods they export to a change in the exchange rate. The percentage by which the prices of the exports rise when the currency of the exporting is appreciating is known as the degree of pass through from the exchange rate to the price. If it is equal to 1, the pass through is complete. If it is less than 1, the pass through is partial or incomplete.

## DATA, MACROECONOMIC VARIABLES AND RELATIONSHIPS

Our objective is to test the following hypotheses, for both in the US and in the EU:

H1: We test the existence of a relation between the number of AD filings and the real exchange rate fluctuations. More precisely is the number of AD initiations increasing with the real appreciation of the reporting country's currency?<sup>3</sup>.

H2. The number of inquiries opened decreases with an increase in the rate of growth of the import country's real GDP. The sensitivity of the business community to perceived foreign unfair pricing behaviour is increased in an economic slump, as is the incentive of foreign firms to cut prices in order to maintain export volumes. At the same time, it becomes easier for the importing country to prove an injury during a slump or downturn in the economy.

H3. The number of antidumping actions rises with an increase in the rate of import penetration in the filing country.

### *DATA*

Data on initiations of antidumping actions between 1990 and 2002 come from the WTO antidumping database. The data are available, because WTO members are under a continuing obligation to report their antidumping actions to the WTO Secretariat (article 6).

Tables 1 and 2 display the number of filings over the period 1990-2002. The figures show that the US initiated twice as many inquiries as the EU. If we consider the patterns of bilateral filings (of each initiating country against particular countries), the US is the most active filer, with 292 actions among which 118 targeted the EU. Conversely, the EU aimed few of its initiations at the US (11 cases out of 133). The EU mostly targeted Asian countries and especially China, which is the most affected country, both by the EU and by the US<sup>4</sup>. The maximum number of filings in any quarter is equal to 5 for the EU, while it is equal to 22 for the US.

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<sup>3</sup> The literature on 'monetary protectionism' notes that a country may devalue its domestic currency in order to boost its exports and improve, albeit disloyally, its competitiveness in the trading partners' markets. However, such 'monetary dumping' is not subject to the WTO antidumping code.

<sup>4</sup> Even though the United States is the most important filing country, it is also one of the most targeted countries, followed by China, Japan and Korea. These 4 countries were cited in 30% of the antidumping procedures initiated between 1980 and 1998.

Table 1: US Antidumping petitions between 1990 and 2002 against selected target countries  
(Number of cases filed per quarter)

	Target countries					
	European Union	Korea	Canada	China	Japan	Five target countries
Average	2.27	0.63	0.42	1.42	0.86	1.12
Minimum	0	0	0	0	0	0
Maximum	22	4	4	4	3	22
Standard deviation	3.62	0.97	0.87	1.30	0.79	1.95
Total	118	33	22	74	45	292

Source: Calculated from data provided by the WTO

Table 2: EU Antidumping petitions between 1990 and 2002 against selected target countries  
(Number of cases filed per quarter)

	Target countries					
	United States	Korea	Canada	China	Japan	Five target countries
Average	0.21	0.61	0.02	1.29	0.42	0.51
Minimum	0	0	0	0	0	0
Maximum	1	3	1	5	3	5
Standard deviation	0.41	0.87	0.14	1.17	0.72	0.87
Total	11	32	1	67	22	133

Source: Calculated from data provided by the WTO

#### VARIABLES IN THE MODELS

In this study, we choose to focus on three factors among the various macroeconomic phenomena which are liable to influence the triggering of antidumping actions: changes in the exchange rate, fluctuations in the level of economic activity; and the rate of import penetration. Monthly data on all of the variables are aggregated to quarters for our analysis because of the large number of months without new petitions<sup>5</sup>.

The impact of these three determinants on antidumping filings is estimated with the OLISNET database of the OECD. The influence of each of these three variables is analysed both in the very short run (one year) and in the short/medium run (three years), except for the exchange rate whose fluctuations are considered only over a one-year period.

#### General economic activity and industrial production

<sup>5</sup> The results of our estimations using monthly data can be obtained upon request.

The influence of the business cycle is evaluated with variations in real GDP or the index of the industrial production. More precisely, we use the average growth rate of GDP, as well as of the industrial production index, either over the previous year (specification #1) or over a 3-year period before the filing date (specification #2).

The average growth of real GDP of the filing country is denoted RGDP(-1) for specification #1 and RGDP(-3) for specification #2. Similarly, the average growth rates of industrial production are denoted INDPROD(-1) and INDPROD(-3).

Economic theory, as well as common sense, suggests that “bad” economic situations reinforce the demand for protection, thus contributing to a resurgence of protectionism, while “boom” periods are likely to further trade liberalization. Nevertheless, the causality relationship is not quite so simple, because trade policy also influences the economic situation. Protection tends to curb economic activity, while trade liberalization stimulates economic growth. Whatever the causal relationship might be, we can expect that filings are negatively related to the business cycle. A glance at the data confirms this relationship. For example, in 1992, an economic slump year, the number of antidumping procedures significantly increased<sup>6</sup>.

#### The force of international competition

The intensity of foreign competition suffered by country  $i$  is measured by the rate of import penetration (denoted  $RIMP_i$ ):

$$RIMP_i = \frac{\sum_j M_{ij}}{DD_i}$$

Where  $M_{ij}$  the imports of product  $j$  by country  $i$  (respectively the US and the EU) and  $\sum_j M_{ij}$  its total imports.

For the purposes of this article, we consider the EU, like the US, as one single commercial entity, which means that we take into account only imports from extra-EU countries<sup>7</sup>.

$DD_i$  is the domestic demand in country  $i$

$$DD_i = P_r C_i + P_u C_i + INV_i$$

Where:

$P_r C_i$  is the private consumption in country  $i$

<sup>6</sup> In 1992, the total number of filings in the world was equal to 326 while this number is usually around 200 per year.

<sup>7</sup> Since the antidumping procedures initiated by the EU are targeted at trading partners outside the Union, it makes sense to consider only the intensification of extra-EU competitive pressure.



$P_u C_i$  is the public consumption in country  $i$

$INV_i$  is the investment in country  $i$

Logically, an increase in the rate of import penetration should lead to greater demands for protection in the importing country. Consequently, filings should be positively related to the import penetration rate.

In our estimations, as for the GDP, we consider both one-year and the three-year average import penetration rates prior to the opening of the antidumping procedure. The rate of import penetration during the previous year is denoted RIMP (-1) while the average rate over the three-year prior to the filing date is denoted RIMP (-3).

#### The foreign exchange rate

The real exchange rate is the last of the three major macroeconomic determinants that we take into consideration. Actually, the influence of exchange rate changes on antidumping filings is not quite obvious. For example, when the US dollar is appreciating, the foreign exporters may have some incentives to increase the price of shipments (denominated in their home currency), so as to reduce the risk to be accused of selling at “less than fair value”. In such a case, the appreciation of the US dollar should logically reduce the opportunities of antidumping initiations by American firms. However, if this price adjustment does not completely offset the total impact of the US dollar appreciation, as echoed by most empirical studies<sup>8</sup>, the dollar price of the US import will fall, which may cause damages to the US industry. Consequently, a strong dollar may increase as well the number of US antidumping initiations, as it makes easier to prove a material injury. Which of these two effects is the most important?

Without prejudging in any way the degree of pass through, we test the relation between the number of quarterly filings and the real exchange rate. To this end, bilateral real exchange rates of the US dollar and the euro vis-à-vis each of the target countries<sup>7</sup> (listed in Tables 1 and 2) currencies are calculated on the basis of consumer prices. The real exchange rate series are normalized by dividing each rate series by its mean so as to offset the scale effect from one exchange rate to the other. We lag the real exchange rate by one year, because the national authorities (both in the US and in the EU) examine pricing issues over a one-year period prior to the opening of investigations<sup>9</sup>. The one-year lagged real exchange rate is denoted RER(-1).

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<sup>8</sup> See for example P. Goldberg and M. Knetter (1997) or J.M. Campa and L. Goldberg (2004)

<sup>9</sup> See Knetter and Prusa (2003) and Feinberg (2003).

## ECONOMETRIC RESULTS

### *OVER-DISPERSION TEST*

The number of antidumping procedures is typical of count data. It is a discrete variable. We can model the probability of occurrence of any number of antidumping filing either with a Poisson or with a negative binomial regression. We have used the test of over-dispersion suggested by Cameron and Trivedi (1990) in order to choose which regression model should be adopted.

The over-dispersion tests are carried out on the average growth rate of real GDP over the three-year period prior to the filing, as well as on the industrial production index over the same period. The results of the test show that the overdispersion parameter is always highly significant. Therefore, there is an over-dispersion of the number of antidumping filings in these two countries. This result leads us to choose a negative binomial model. Furthermore,  $\alpha$ , the over-dispersion parameter is also positive and significant in the various estimations based on the negative binomial model. The data are thus consistent with this model.

### *WHY TWO SPECIFICATIONS?*

The WTO antidumping committee does not provide accurate indications about the time period which has to be taken into account in the investigations aimed at analyzing whether or not dumping is taking place and whether dumped imports are causing material injury. The 1994 GATT agreement states that the period taken into consideration in the investigation of the existence of dumping ‘is normally one year, but should not in any case be less than 6 months’. The recommendation of the WTO antidumping committee is representative of the absence of guidelines: according to this committee, the investigations meant for assessing the damages should normally cover at least three years, but they also can cover a shorter period.<sup>10</sup> This means that national authorities are completely free to adapt these periods to each specific case. The consequence is a large disparity of practices and legal frameworks from one country to another<sup>11</sup>.

In the US, the Department of Commerce (DOC) is in charge of determining dumping while the International Trade Commission (ITC) is in charge of injury determination. These two government agencies investigate over a three-year period prior to the filing of the case. In the EU, the European Commission assesses both price behaviour and material injury. The usual

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<sup>10</sup> WTO recommendation May 5, 2000.

<sup>11</sup> However, the dominant practices of the national authorities – consistent with the recommendations of the WTO antidumping committee – adopt a short period (typically one year) in the pricing behaviours investigations and a longer period (typically 3 years) in the material injury investigations.

procedure is to investigate whether or not dumping is taking place over a 6 to 12-month period (in most cases). After that, injury investigations are carried out by the Commission over a three-year period<sup>12</sup>. However, in some cases, the time period applied to injury determination can be reduced to only one year<sup>13</sup>.

Of course, the choice of one year instead of three years in injury assessment influences the identification of the determinants of antidumping filings. The choice of time period is an important specification issue. Assuredly, any choice is, to some extent, arbitrary. However, our 2 specifications (respectively based on a one-year period and a three period) give a plausible approximation of the actual procedures of the reporting countries. In addition, this choice may be useful to differentiate the practices of the US and the EU. Lastly, it is also justified by the fact that Knetter and Prusa (2003) and Feinberg (2005) consider a one-year lag for the foreign exchange rate and a three-year period for the GDP, which will facilitate the comparison between their results and ours.

Due to the correlations among the growth rate of the GDP, the rate of import penetration and the index of industrial production, we develop three estimation models in which each of these variables is considered separately. These models are applied, for each specification (one or three years), both to the US and the EU, resulting in a total of 5 models to be estimated for each country.

In specification #1, we consider the real GDP growth rate, the average rate of import penetration and the industrial production index during the year prior to the antidumping filing (see columns i, ii, and iii in tables 3 and 4). In specification #2, we refer to these same variables over a three-year period prior to the filing (see columns iv, v and vi in these same tables). The real exchange rate is present in all the specifications.

After estimating the influence of each variable on the number of filings, we try to estimate eventual trend effects: does this influence change over time and if so in which direction? To this end, we identify a variable, TIME, defined as the date of the filing, expressed in number of quarters since the beginning of the period chosen (that is: since the beginning of 1990). So, the TIME value associated with the first quarter of 1990 is equal to 1, the second quarter has a TIME value equal to 2, and so on up to 52 for the last quarter of 2002. We capture a possible interaction between each determinant variable and TIME by multiplying each variable by the log of TIME (Log-TIME). In order to simplify the interpretation of the estimated coefficients, we combine Log-TIME with the log of each determinant variable, except for the GDP real growth rate (which can be a negative value).

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<sup>12</sup> In accordance with the WTO antidumping code, a causality relation must be established between dumping and injury to community industry.

<sup>13</sup> See the WTO recommendation, G/ADP/6, May 16, 2000.

## RESULTS

To facilitate the comparison of our results with those of Knetter and Prusa (2003) and Feinberg (2005), we present in Tables 3 and 4 the incidence rate ratios (IRR) associated with the estimated coefficients. The Poisson regression model assumes that the incidence rate (i.e. the rate per unit at which a happening occurs) is a function of some underlying variables as follows:

$$Ir = e^{\beta_0 + \beta_1 x_{1j} + \beta_2 x_{2j} + \dots + \beta_k x_{kj}}$$

The expected number of occurrences is equal to this incidence rate multiplied by the exposure (the number of units of time over which observations are measured). The exposure is uninteresting in our case since each observation in the data set is the number of antidumping filings in a one-year and three-year interval.

The IRR is a function of some underlying variables. IRR represents the ratio of the counts predicted by the model when the variable of interest is one unit above its mean value and all other variables are at their means to the count predicted when all variables are at their means. Thus, if the IRR for the real exchange rate is 1.50, then a one-unit increase in the real exchange rate (a 100% real appreciation given that we use the log of the real rate) would increase counts by 50% when all other variables are at their means. (Knetter and Prusa, 2003). The *t*-statistics are reported for a test of the null hypothesis that the IRR=1, which would imply no relationship between the dependant variable and the regressor.

For the US, the estimations are completed by estimations with temporal effect, which take into account the interactions of three variables TXGDP, LogRIMP and LogINDEXPROD with LogTIME for each specification. We use TIME variable to control the learning's effects. The log specification for the TIME variable (LogTIME) is connected to the decreasing marginal learning effects. For the EU, we only presented the specifications without temporal effects because variables with temporal effects yield no significative coefficients. Indeed, there are few openings antidumping procedures (compared with the US). The expected learning effects do not exist in fact in EU.

### US Results

#### *Specification #1*

The IRR estimated for the exchange rate delayed one year LogRER (-1) is 1.03 in columns (i), (ii) and (iii) of the table 3. That means a real appreciation of 100% of the exchange rate would increase the openings of AD procedures to 3%. The integration of the temporal effect shows that a real appreciation of 100% of the exchange rate delayed one year would reduce the

number of AD procedures from 12% to 13.5% (the IRR is included between 0.88 and 0.86).

The average rates of GDP growth, import penetration and the index of industrial production are not significant. Their effects are thus considered as null, the IRR is fixed to 1. When we take into account the temporal effect, the IRR of  $\text{LogTIME*RGDP} (-1)$  is 0.78, implying that a 22% reduction in the number of openings of procedures is associated to a one percentage point increase in the GDP growth rate. The IRR of  $\text{LogTIME*TPIMP} (-1)$  is 0.31. An increase of 100% of the import penetration rate of the US would increase the number of openings of antidumping procedures to 69% in the time period considered.

On the whole, our results show that short variations in the level of general economic activity or in the level of industrial activity or in imports have no significant impact on the number of openings of antidumping procedures. Next we consider the results for longer periods.

#### *Specification #2*

Columns (iv), (v) and (vi) in Table 3 show that an appreciation of 100% in the lagged real exchange rate would increase openings of antidumping procedures by 25%. An appreciation of 100% in the lagged real exchange rate with temporal effect  $\text{LogTIME*LogRER} (-1)$  would reduce the number of procedures by 27% (IRR equal to 0.73). The directions of evolution of variables are coherent with those obtained by Feinberg (2005). It means that the positive relation between the real exchange rate and the opening of antidumping inquiry is a short-term relation. Over a long period, the appreciation of the exchange rate would even tend to lower the number of AD procedures.

The IRR of the average GDP growth rate  $\text{RGDP}(-3)$  is 0.09. A decline of a unity of the growth rate would thus increase the number of openings of antidumping procedures to 91% in the US. This result confirms our expectations and is in accordance with the results of the previous studies: the slowing down and, to an even greater extent, the decline of the economic activity increases the openings of antidumping actions. In the phases of expansion, we note fewer antidumping procedures. However, if we take into account the temporal effect, the relation between the GDP and the number of antidumping filings turns out to be positive: a one percentage point increase in the GDP growth rate over the entire period would increase the number of filings by 24.6%.

It is different when we take into account the index of industrial production. Indeed, the IRR of  $\text{LogINDEXPROD} (-3)$  is not significant. On the other hand, the IRR of  $\text{LogTIME*LogINDEXPROD} (-3)$  is 1.02. In the long run, an increase of the index of industrial production would thus

engender an increase of 2% in the number of antidumping procedures in the US.

Import penetration rate has an IRR, which is equal to 1.6015. An increase of 100% of the import penetration rate would lead to an increase of 61.5% of the number of procedures. This effect disappears in the long run (coefficient not significant for  $\text{LogTIME} * \text{LogTPIMP} (-3)$ ). This means that in the long run, the intensity of the foreign competition does not produce a significant effect on the initiations of antidumping actions. The influence of the competition is essentially cyclic.

## EU Results

### *Specification #1*

Columns (i) and (ii) in Table 4 show that the IRR of the real exchange rate lagged one year is 1.02. So, an appreciation of 100% of the real exchange rate would increase the number of the antidumping procedures to 2%.

The average rate of GDP growth during the year previous to the opening of the antidumping procedure is not significant. Short-term variations in general economic activity, thus do not seem to affect the openings of antidumping inquiries in Europe. This result is confirmed by the non-significativity of the import penetration rate variable. This conclusion is qualified by the effect of the index of industrial production. Indeed, an increase of 100% of  $\text{LogINDEXPROD} (-1)$  would decrease the number of opening procedures by 14% (because the IRR of the index of the industrial production is 0.856) in Europe. All in all, only short-term variations in specific industrial sectors have a significant influence.

Table 3: IRR in the United States

Variables	Specification#1			Specification#2		
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
LogRER(-1)	1.0303 (2.749)	1.0296 (2.486)	1.0302 (2.512)	1.2458 (2.921)	1.2511 (3.107)	1.2544 (3.156)
LogTIME* LogRER(-1)	0.8770 (-2.945)	0.8763 (-2.737)	0.8741 (-2.747)	0.7354 (-3.388)	0.7308 (-3.566)	0.7311 (-3.577)
RGDP(-1)	1.00 (0.268)					
LogTIME* RGDP(-1)	0.7815 (-2.417)					
LogRIMP(-1)		1.00 (0.858)				
LogTIME* LogRIMP(-1)		0.3117 (1.649)				
LogINDPROD(-1)			1.00 (1.522)			
LogTIME*LogINDPROD(-1)			0.9968 (-1.8822)			
RGDP(-3)				0.0891 (-2.298)		
LogTIME* RGDP(-3)				1.2465 (2.108)		
LogRIMP(-3)					1.6015 (1.981)	
LogTIME* LogRIMP(-3)					1.00 (1.052)	
LogINDPROD(-3)						1.00 (-0.844)
LogTIME*LogINDPROD(-3)						1.0179 (1.667)
Log likelihood unrestricted	-316.324	-318.566	-317.981	-236.217	-236.63	-245.799
Likelihood ratio test	96.4656	101.4925	100.7409	18.1267	21.0202	36.2856
Number of observations	220	220	220	180	180	180

Estimated are reported as "incidence rate ratios". t-statistics (in brackets) reported for a test of no effect on antidumping actions (which corresponds to an IRR value of 1.0). The likelihood ratio test points out that all the slope coefficients in the binomial negative are zero. For this test, the constant term remains unrestricted

*Specification #2*

The real exchange rate always appears as a significant determinant of antidumping actions. According to our estimation, an appreciation of 100% in the real exchange rate would lead to an increase in the number of the antidumping procedures from 13% to 24% (The IRR varies between 1.13 and 1.24).

Table 4: IRR in Europe

Variables	Specification #1:			Specification #2		
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
LogRER(-1)	1.0244 (2.472)	1.018 (2.570)	1.023 (2.516)	1.1351 (2.604)	1.119 (3.830)	1.2431 (3.751)
RGDP(-1)	1.00 (0.676)					
LogRIMP(-1)		1.00 (0.917)				
LogINDPROD(-1)			0.856 (1.965)			
RGDP(-3)				1.00 (-1.228)		
LogRIMP(-3)					1.00 (1.217)	
LogINDPROD(-3)						0.7962 (-2.37)
Log likelihood unrestricted	-208.5098	-209.152	-208.83	-166.22	-163.804	-163.61
Likelihood ratio test	16.8996	16.335	16.8031	14.3407	11.794	11.4934
Number of observations	220	220	220	180	180	180

Estimated are reported as “incidence rate ratios”. t-statistics (in brackets) reported for a test of no effect on antidumping actions (which corresponds to an IRR value of 1.0). The likelihood ratio test points out that all the slope coefficients in the binomial negative are zero. For this test, the constant term remains unrestricted.

The average rate of growth during the three years, which precede the opening of a procedure, has a negative coefficient but is not significant. Cyclical variations thus seem to have hardly any influence on the openings of inquiries in Europe. This result is in accordance with what actually happens in Europe. On the other hand, the IRR of LogINDPROD (3) is 0.796. So, an increase of 100% in the index of industrial production would reduce the number of anti-dumping procedures to 20%. Therefore, European firms are more sensitive to industrial production than to the import penetration rate. Indeed, our results show that this variable is not significant even with a temporal effect.



*COMPARISONS OF RESULTS*

## Comparison of the results between Europe and the United States

The results obtained allow us to differentiate the influences that the macroeconomic factors exercise in the US and in the EU respectively.

- a) A first difference between the two is the fact that in Europe, temporal effects are not significant in the model. A possible explanation of this result is that the EU opened relatively few antidumping procedures over the period 1990-2002. The total of the openings of procedures vis-à-vis the five targeted countries taken into consideration is only 133 for the EU against 292 for the US.
- b) The exchange rate has a significant effect in the US as well as in the EU. The IRR in the US is very close to those of the EU. For the US, we established the existence of a negative temporal effect of the real exchange rate lagged one year on the openings of procedures. This means that a preservation of the pattern (a continuous decline of the exchange rate) over the whole period would lead to a decrease of the number of inquiries.
- c) We can also note that the period used to estimate damages has a rather significant effect on the probability of an inquiry being opened. Thus, in Europe, when a period of one year is used to estimate the damage, the level of the IRR of the real exchange rate is around 2% while it is around 24% when a three-year period is used. In the US, when a period of one-year is used to estimate the damage, we obtain an IRR from the real exchange rate of about 3%. The IRR is around 25% when a three-year period is used. However, when the period of evaluation is of one-year, the growth rate of the GDP is not significant in either Europe or the US. *A contrario*, when we use a period of three- years to estimate the damages, the GDP growth rate has a significant effect with a weak IRR in the US. This is not the case in Europe.

Differences in practices and in the antidumping legislation thus appear clearly. Indeed, in the US, contrary to Europe, the ITC systematically uses a three-year period to determine the possible damage.

- d) The effect of intensification of international competition is null on a horizon of one- year but very high in the US on a three-year horizon. This effect is captured by the import penetration rate variable.
- e) Finally, the evolution of industrial production does explain antidumping petitions when the period of evaluation of the damages is

three years in the US. On the other hand, when we use a lag of one-year to estimate damages, the impact of industrial production is significant. Surprisingly, in Europe, we obtain an opposite relationship between industrial production and antidumping initiations, both over one and three years.

Overall, three main conclusions can be drawn from this comparison:

- Variations in the exchange rate are the best common explanation for both countries.
- The index of industrial production is a best "candidate" to characterize the EU because it is significant in Europe both over a one or a three-year period (which is consistent with the actual practice of the European Commission).
- The growth rate of the GDP is the best "candidate" the US. Its impact is significant and important only in the US when we use a period of three-years to estimate the damages (as is the actual practice of the American authorities).
- The choice of the period for the evaluation of the damages directly influences the estimate of the probability of an inquiry being opened.

So the differences noted between the US and Europe seem to be – at least partly - explainable by the differences of national regulations and practices implemented by the regulatory authorities.

Comparisons of the results obtained with those of Feinberg (1989, 2005) and Knetter-Prusa (2003). Table 5 below gives a summary of all the obtained results. Prusa and Knetter (2003) found that a real appreciation of 100% of the dollar would increase the number of procedures by 267% (with a ratio of rate of incidence of 3.67), all other variables being at their averages. Feinberg (2005) shows that a real appreciation of 100% of the dollar would increase the number of procedures by 206% with a ratio of rate of incidence of 3.06. Our estimates are similar to those of previous studies, but with weaker IRR. A possible explanation may be found in the fact that our period of study extends over a shorter period (13 years from 1990-2002), while both prior studies are for 19 years (1980-1998). Over the longer period, the number of observed procedures is greater. Furthermore, the earlier studies use annual data on a larger number of countries, whereas we use quarterly data. Finally, their estimates are based on negative binomial regressions with random effects.

Table 5: Estimated coefficients: Comparisons with prior econometric studies

Macroeconomic factor	US			EU	
	S1	S2	F or KP <sup>a</sup>	S1	S2
Exchange rate without temporal effect	+***	+***	+***	+**	+***
Exchange rate with temporal effect	-***	-***	-***	ns	ns
GDP without temporal effect	+ns	-**	-**	+ns	-ns
GDP with temporal effect	-**	+**	+**	ns	ns
Industrial Production without temporal effect	-***	-ns	nd <sup>b</sup>	+**	-**
Industrial Production with temporal effect	+*	+*	nd	ns	ns
Import penetration rate without temporal effect	+ns	+**	nd	ns	ns
Import penetration rate with temporal effect	+*	+ns	nd	ns	ns

\*\*\*= significant at the 1 % level. \*\*= significant at the 5 % level \*= significant at the 10 % level  
<sup>a</sup> This column compares our results with those obtained by Feinberg (1989, 2005) and by Knetter and Prusa (2003).  
<sup>b</sup> Nd means that these variables were not studied in the previous works. Ns means not significant.

## CONCLUSION

We have shown that macroeconomic variables have different effects on the numbers of openings of antidumping procedures in the US and in Europe. First, an appreciation of the real exchange rate has a positive impact on openings of procedures in the US and within the EU. However, the dimension of the effect is greater in the US and the temporal effect of the exchange rate is present only in the US. Next, the economic cycle (measured by GDP changes) has an impact on openings of procedures only in the US. The intensification of foreign competition (measured by the import penetration rate) also increases openings of procedures in the US. Openings are also influenced by the very short-term and/or medium-term level of general American economic activity, whereas they depend more specifically on the economic situation of the industry in Europe. These results show the influence of institutional differences, notably in the rules, which govern the antidumping procedures on both sides of the Atlantic. The difference concerning the reference periods in the calculation of damages is perceptible in our results (a shorter period in the case of the EU of the order of 15 months against three years in the US). It also seems that the European procedure is less effective – or, at least, offers a lesser degree of protection - than the American procedure when we consider the impact of the economic cycle, the influence of exchange rates and competitive pressures. Paradoxically, however, the European procedure seems more selective, perhaps more targeted, than the American procedure (we noted no significant relationship with the GDP in Europe, but a relationship with industrial production was found in Europe whereas the opposite was found for the US). Future research should go beyond the simple explanation of openings

of antidumping procedures undertaken in this study to take into account the impact of world competition. For example, only cases of dumping which lead to a threat of monopolization of the market must now be sanctioned in the form of temporary or definitive antidumping rights. These two factors, world competition and the WTO definition of dumping may be found to have major responsibility for the current intensification of the use of non-tariff barriers, in particular institutional barriers to trade.

This 'crawling neo-protectionism' could eventually ruin the efforts of half a century to liberalize international trade and build a multilateral trading system. The EU and the US should accept the responsibility for engaging in a "disarmament" process regarding these procedures by proposing an amendment to the Antidumping Agreement, which would limit the discretionary power of the national authorities. It would also be advisable to increase transparency in the determination of damage, in the normal calculation of the value of damage, and in the determination of the dumping margin.

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