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Patterns and determinants of anti-dumping: A worldwide perspective

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Working Paper No. 113

**PATTERNS AND DETERMINANTS OF ANTI-DUMPING:
A WORLDWIDE PERSPECTIVE**

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OCTOBER 2003



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Foreword

This paper, Patterns and Determinants of Anti-dumping: A Worldwide Perspective' is part of the research programme on the WTO-related issues, funded by the Sir Ratan Tata Trust. It takes a critical look at the trends in worldwide anti-dumping case filings and measures taken during the last two decades. The author also examines how macro economic factors influence the use of anti-dumping in developed and developing countries. The analysis reinforces the view that the primary jurisdiction for the anti-dumping law is really more political than economic. It is observed that as tariff rates are reduced further, the use of anti-dumping will spread among developing countries not only due to greater liberalisation pressures but also due to the fact that more and more countries would like to create anti-dumping ability to counter anti-dumping use against them. This may reverse the trade gains that liberalisation may ensure to them. This study argues that further fine-tuning and refining of the anti-dumping policy is not the answer to prevent its (mis)use. It calls for fundamental changes in this law.

Arvind Virmani
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October 2003

Patterns and Determinants of Anti-dumping: A Worldwide Perspective

*Aradhna Aggarwal**

I. Background

GATT 1947 envisaged an elaborate plan for trade liberalisation. While its negotiators recognised the gains from free trade, they were also cognizant that openness might make economies vulnerable to injury due to adverse trade shocks and that any government that maintained an open trade regime must have at hand some sort of pressure valve to manage occasional pressures for exceptional or sectoral protection. For that reason, they provided a number of provisions for contingent protection within the GATT, which permitted the signatories under specified circumstances to withdraw their normal obligations. The three most important contingent protection measures were - anti dumping, safeguard and countervailing duties¹. However these measures were used rarely until recently. The Uruguay Round of Multilateral Trade negotiations concluded on 15th April 1995 in Marrakesh provided elaboration on the basic principles to govern the determination and application of the three main contingent measures. Since then, contingent protection has evolved into a global phenomenon with an increasing number of countries adopting contingent protection laws and making use of them. The bulk of contingent protection however falls on the instrument of anti-dumping. Between 1995 and 2000, the number of anti-dumping cases initiated accounted for 89.1 per cent of the total of the three main contingent measures used (Table 1). The share of CVD remained as small as 7.1 per cent. Safeguard have been the least frequently used measures with their share being only 3.8 per cent over this period.

* The author would like to thank Professors Arvind Virmani and B.N.Goldar for their valuable comments on an earlier draft of the paper. The paper was presented in a seminar organised by ICRIER. Comments of participants are gratefully acknowledged. Any remaining faults are the sole responsibility of the author.

¹ See, Hoda 1987 for a detailed analysis of GATT 1947 provisions and developments in subsequent rounds.

Table 1 : Initiations of contingent protection measures

	CVD	Anti-dumping	Safeguard
1995	10	156	2
1996	7	221	5
1997	16	242	3
1998	26	232	10
1999	40	339	15
2000	16	251	26
Total	115	1441	61

Source : Rowe and Maw (April 2001)

Anti-dumping has now become an important trade policy tool for developed and developing countries, both. Only a decade ago developing countries had a negligible share in anti-dumping cases. They were involved in anti-dumping only to the extent that they were on the receiving end. By the end of the 1990s these countries themselves became active users of anti-dumping and now they initiate almost half of the total number of anti-dumping cases. This surge of anti-dumping activities raises a number of questions. Is the number of anti-dumping cases rising alarmingly? Is the use of anti-dumping widespread among developing countries? Are they reporting more cases than those directed against them? Can they defend the cases they report as successfully as developed countries? Are their investigations directed towards developed countries? What is the primary concern of countries while using this mechanism ? Is this mechanism in reality used as a trade correcting measure? Do developing and developed countries have different motivations for adopting these measures? The present paper aims at addressing some of these questions. While doing that, it broadly classifies these questions into two sets. While one set of questions relates to the trends and patterns of anti-dumping use, the other set of questions pertains to the motivation of anti-dumping initiations. Thus, the objectives of the paper are twofold. *First*, it investigates the trends and patterns of the use of anti-dumping in developed and developing economies for a period of over 20 years from 1980 to 2000. *Second*, it investigates the factors that motivate anti-dumping initiations. The modern theory of anti-dumping termed ‘political economy approach’ provides the theoretical underpinning for the analysis of the factors that motivate anti-dumping initiations. This approach implicates that domestic firms use anti-dumping in order to become a strategic shelter from foreign competitors. While using this approach most studies (Finger 1981, Herander and Schwartz 1984, Feinberg

and Hirsch 1989, Hansen 1990, Krupp 1994) Leichenberg and Tan 1994, Sabry 2000, Prusa and Skeath 2002) have focussed on the role of industry specific factors in motivating anti-dumping initiations. The present study however investigates whether anti-dumping actions may be related to macroeconomic conditions. Though there have been a few attempts to analyse the role of macroeconomic conditions in motivating anti-dumping initiations, these are directed to the developed countries and are either narrowly focussed or have inadequate data coverage (Leidy 1997 and Feinberg 1989 for the US, Becker and Theuringer 2001 for the EU, Knetter and Prusa 2003 for four developed countries- US, Canada, Australia and EU). For instance, Feinberg (1989) concentrated on the effect of exchange rate movement on US anti-dumping filings across four import source countries : Brazil, Korea, Japan and Mexico for 24 quarters from 1982 through 1987. In doing so, he employed a single-variable model. Knetter and Prusa (2003) also focussed on the relationship between exchange change variations and anti-dumping filings. They used an extended model which had, apart from exchange rate, real GDP also as an explanatory variable. They ignored other macroeconomic factors. Analyses of Leidy (1997) for the US and Becker and Theuringer (2001) for the EU are constrained to short time series which weakened the creditability of their results. The present study examines the macroeconomic determinants of anti-dumping filings in developed and developing countries in a comparative framework. It draws on the existing literature to identify a number of possible motives of the users of anti-dumping and empirically examines, using a panel data set of 99 countries² over the period 1980-2000, which of the motives receives support in the data.

The paper begins by examining the genesis and evolution of the anti-dumping mechanism in Section II. Section III then carries out an in depth analysis of the trends and patterns of anti-dumping initiations and targets. Section IV provides an empirical analysis of the macroeconomic factors that are expected to influence anti-dumping initiation activity. Finally, Section V draws policy implications.

² These countries include all reporting and targeted countries.

II. Genesis and Evolution of Anti-dumping

Anti-dumping rules started to develop in the early part of the 20th century with the adoption of legislation by firstly Canada in 1904, and subsequently New Zealand (1905), Australia (1906) and the United States (1916). For the first anti-dumping law, passed in Canada in 1904, the real impetus was Canadian manufacturing's concern about low import prices. Its primary objective was to protect Canadian firms from steel dumped in Canada by the US firms. In the United States, however, the 1916 Anti-dumping Act was narrowly aimed at predatory pricing by foreign exporters (Hufbauer 1999). It was a criminal statute that was born out of fear that after the end of WWI European-especially German, firms would try to regain their position on the US markets through predatory pricing (see for instance, Almstedt 1981). It required the complainant to prove that the foreign supplier resorted to predatory dumping. In 1921, the US adopted an amended Act, which closely resembled Canada's anti-dumping law. It was a civil statute to assess penalty duties to compensate for price differentials. In the same year, the UK also adopted its first anti-dumping legislation whilst Canada, New Zealand and Australia substantially amended their acts. These developments, notwithstanding, anti-dumping remained a relatively infrequently used instrument. In the immediate post-war period only South Africa, Canada and Australia were using anti-dumping as an important trade instrument.

The anti-dumping law was not regulated under international law until the adoption of GATT 1947. GATT 1947 incorporated the basic conditions for adopting anti-dumping measures with the insistence of the US. Following GATT 1947, discussions concerning the development of comprehensive anti-dumping rules continued with GATT Working Parties in the 1950s and 1960s . However, there was no significant development on this issue and it remained a minor trade instrument. anti-dumping disputes were relatively few and far between until 1980. In GATT's early years, renegotiations and emergency actions (restrict first and then negotiate compensation) were the principle mechanisms for making adjustments (Finger et al. 2001). During GATT's first 15 years (1947-1962), countries opening their economies to international competition availed of such measures in large proportion. In the 1950s, more elaborate renegotiation provisions were added to the GATT. By 1963, 110 renegotiations had been undertaken. These amounted to almost four per member country. The use of renegotiations began to wane from 1963 onwards.

These were replaced by Voluntary Export Restraints (VERs). VERs were bilateral negotiations outside GATT' auspices through which exporting countries were persuaded to restrain exports voluntarily. Though VERs were GATT-illegal, they were consistent with the principles of reciprocity. They were based on negotiations between trading partners. These negotiations prevented chain reaction. Besides, VERs provided compensation, the compensation being the higher price/ ensured market that the exporters would get. The Long Term Cotton Textile Arrangement negotiated in 1962 brought GATT sanction to industrial economies' VERs on cotton textiles and apparels. The Multi Fibre Arrangement (MFA) negotiated in 1972 extended the GATT sanction for such restrictions to virtually all textiles and clothing products. The industrial countries used VERs in several other sectors like steel, footwear, motor vehicle and electronic products. The use of anti-dumping measures had been limited during this period. There is no exact accounting of worldwide anti-dumping activity for this period because before 1980, the GATT did not require countries to report when they initiated contingent protection actions. However, some estimates on the number of anti-dumping actions do exist. Finger (1993) for instance, observed that in 1958, when the GATT countries first analysed the number of cases, 37 anti-dumping measures were in force (excluding Canada and New Zealand from whom no figures were collected) of which 21 were adopted by South Africa. Hufbauer (1999) found that between 1954 and 1974, fewer than 100 cases were brought in the US and most were dismissed. Schott (1994) noted that in the 1960s all GATT members led only about ten anti-dumping petitions per year.

In the Kennedy Round (1963-67) regulation of anti-dumping rules was taken up in earnest and an international code on anti-dumping procedures was adopted. This entered into force in 1968 and was named 'Agreement on the implementation of Article VI of GATT' or in short 'Anti-dumping Agreement'. This formed the basis for the first European Community anti-dumping legislation adopted in 1968. However, the use of anti-dumping remained very limited among the contracting parties. Almost all anti-dumping activity was confined to six major users – the US, the EU, Australia, Canada, South Africa and New Zealand with 24-36 cases filed per year for all these users combined. The Kennedy Round was followed by the Tokyo Round Code (1973-78) which entered in to force in 1980 and set out detailed procedural requirements that must be fulfilled in the conduct of investigations (See Krishna 1997 for details). The use of anti-dumping

activity increased dramatically in the post Tokyo Round Period of the 1980s. Around 1600 cases were filed worldwide during the 1980s which was double the filing rate of the 1970s. However anti-dumping activities in this period were driven mainly by developed countries. This was because only 27 countries – mostly developed countries signed the Tokyo Round and were bound by its requirements. Developing countries did not subscribe to it. By the early 1990s, however, some of the developing countries also started participating in this activity. The Uruguay Round (GATT 1994) that followed the Tokyo Round and came into force in 1995, more precisely defined the rules and procedures of anti-dumping measures. The new Agreement introduced more detailed procedures for initiating and conducting anti-dumping investigations and reduced discretion with respect to methods used to determine dumping and injury margins, sunset clause, and particular standards for dispute Settlement Panels to apply in anti-dumping disputes. The revised Agreement provides for greater clarity and more detailed rules in relation to the method of determining that a product is dumped, the criteria to be taken into account in a determination that dumped imports cause injury to a domestic industry, the procedures to be followed in initiating and conducting investigations and the implementation and duration of anti-dumping measures. It was expected that higher standards of initiations of anti-dumping cases would restrain its use by member countries by making it more difficult to file complaints and to prove dumping and injury, and by strengthening the dispute settlement system (See Krishna 1997, Roitinger 2002). However, contrary to the expectation, there was a dramatic increase in the use of anti-dumping activity by developing countries in the post Uruguay Round. anti-dumping has now evolved into a global phenomenon with an increasing number of developing countries adopting these laws and making use of them. Total number of 2675 cases were initiated in the 1990s. Of these, 1335 cases were filed in the post WTO period of the late 1990s. Almost all WTO member countries have now adopted/amended their anti-dumping legislation. Some of the countries that are not members of WTO (such as Russia) have also acquired their anti-dumping legislation. What follows is an attempt to analyse the trends and patterns of the worldwide use of anti-dumping activity.

III. Trends and Patterns of Anti-dumping Use

While analysing the trends and patterns of worldwide anti-dumping use, the paper uses a detailed data set provided by the rules division of WTO³. From the beginning of 1980 the Anti-dumping Code of the General Agreement on Tariffs and Trade (GATT) required its signatories to submit reports of their anti-dumping activity to the GATT Committee on Anti-dumping Practices every six months. As a result, the Rules Division of the WTO has created a detailed database on anti-dumping cases. This database is multidimensional. It provides information on anti-dumping activity of WTO members by initiating country, targeted country, targeted vs initiating country, sector and year. Although there are various errors, omissions and inconsistencies in the reports, WTO database remains the best source of international data available on anti-dumping activity. The present study makes use of this database for analysing broad trends in anti-dumping actions. Using the classification adopted from the World Bank (2000), it classifies initiating and targeted developing countries by level of development; i.e. whether such countries are low income countries, lower middle income countries, upper middle income countries. Developed countries are categorised as OECD or non-OECD high income countries. In all, the paper identifies five categories of countries : low income, lower middle income, upper middle income, OECD and non-OECD developed countries (Appendix Table A2). The paper analyses the patterns of anti-dumping use across these different categories of countries. The sector disaggregation in the database follows the HS Classification of trade and is provided at the 2 digit level. We thus had data of anti-dumping initiations for 21 sectors. We rearranged this data into 4 broad categories – resource intensive sectors, labour intensive sectors, science based and miscellaneous sectors. Science based sector was further reclassified into differentiated and scale intensive sectors. While doing so we broadly followed the World Bank sectoral classification (Appendix Table A3)

This section is organised into 4 subsections. Section III.1 documents the trends and patterns of anti-dumping initiations by country group, country and time period. Section III.2 analyses the patterns of targeted countries. Section III.3 reveals who targets whom. Finally section III.4

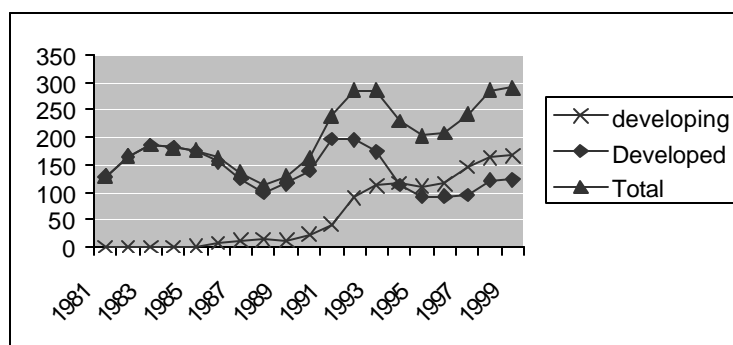
³ We thank Dr. Raul Torres for providing us the desired information from this database.

provides an analysis of anti-dumping activity by sector both globally and within each initiating and targeted country group.

III.1 Initiations

The extent of anti-dumping activity may be gauged from the number of worldwide anti-dumping initiations. Fig. 1 shows the trends of worldwide anti-dumping actions over the past two decades. Since the number of anti-dumping initiations is characterized by wide yearly

Fig. 1 : Initiations by country group: 3-yearly moving average (1980-2000)



fluctuations, we plotted 3-yearly moving averages. Two observations may be made. *First*, during the 1990s the use of anti-dumping activity increased significantly over the late 1980s'. A total number of 668 cases were reported in the late 1980s. In the early 1990s however, the number of anti-dumping initiations shot up to 1240. Following years witnessed further growth in anti-dumping investigations. During 1996-2000, the total number of anti-dumping cases reported was 1335. *Second*, before the Uruguay Round went into effect developed countries were more significant users of this law; since this agreement went into effect in 1995, developing countries have been using the law more aggressively than their developed country counterparts. Thus, the use of anti-dumping activity that was confined only to developed countries spread across different country groups during the late 1990s.

Table 2 provides summary information on anti-dumping initiations between 1980 and 2000 broken down by country- group and time period. Twenty years' data have been rearranged for

summary information in four time periods of 5-years each to avoid the problem of year to year fluctuations that characterise anti-dumping investigations. The table shows that

Table 2 : Anti-dumping initiations by country group : Number of cases (1980 to 2000)

	Number of cases			
Year	1980-85	1986-90	1991-95	1996-00
<i>Developing Countries</i>				
Low	0	0	21 (1.7)	209 (15.6)
Middle	0	0	66 (5.3)	213 (15.9)
Upper	0	63 (9.4)	369 (29.7)	345 (25.8)
<i>Developed countries</i>				
OECD	930 (100.0)	605 (90.6)	774 (62.4)	550 (41.2)
Non -OECD	0	0	10 (0.8)	18 (1.3)
Total	930 (100.0)	668 (100.0)	1240 (100.0)	1335 (100.0)

Note : Parentheses show the percentage of total cases

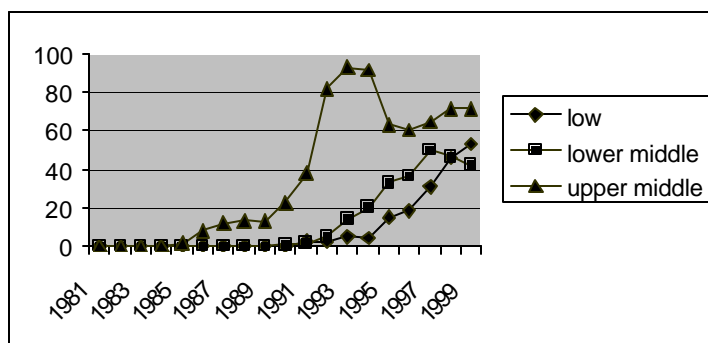
Source : Author's computations based on WTO Secretariat Rules division database

till 1984, all cases were initiated by OECD countries; developing countries did not participate in this activity. During the late 1980s, upper income developing countries also started initiating/filing anti-dumping cases but their share remained mere 9%. In the early 1990s, there was a sharp increase in cases opened by these countries and their share in total cases initiated increased to around 30%. A cyclical downturn was observed around that time in the world prices of many commodities. It appears that it induced new users, upper middle income countries in particular, to use the instrument of anti-dumping to protect their industries (see, Miranda et al. 1998). The late 1990s witnessed a sharp increase in anti-dumping initiations by low and lower middle income developing countries also. The number of anti-dumping initiations for low income countries over 1996-2000 was 10 times that of what it was in the early 1990s. The cases reported by OECD and upper middle income countries declined marginally during this period; but increase in the cases in low and lower middle income countries more than compensated the decline. Thus, developing countries of all stages of development and industrialisation joined the ranks of active anti-dumping users by the late 1990s and fuelled the surge in anti-dumping cases.

They together accounted for 57% of the total cases. In the pre-WTO regime, GATT specifications of trade restrictions were of limited relevance to developing countries. Many developing countries had bound only a few of their tariffs; hence they could increase these tariffs without violating the GATT obligations. However, under WTO, all parts of agreements are applied to all member countries. Developing countries all submitted the schedules of bound tariff rates. It could be that these countries started using anti-dumping in order to avoid some of the adverse effects of liberalisation and in order to reassure domestic political interests that some form of ‘safety net’ remains in place. Anti-dumping is thus no longer a law that is used by the developed country group alone.

Patterns of anti-dumping use changed significantly even within the group of developing countries. Fig 2 shows that prior to the Uruguay round, among developing countries, upper middle income countries were the heaviest users of this law. In the Post Uruguay Round period however, the

Fig 2: Anti-dumping Initiations by developing country group : 3 years' moving average (1980-00)



numbers dropped for them. In contrast, the number of cases opened by low and lower middle income countries continued to rise reducing the gap in anti-dumping filings across different developing country groups.

Analysis of country wise initiations suggests that anti-dumping cases till 1985 were initiated by the four contracting parties of the GATT – Australia, Canada, the EU and the US, all OECD

countries. In the late 1980s, Mexico – an upper income country joined the anti-dumping club as a major user of such actions. Other Latin American countries- Argentina, Brazil, Columbia followed Mexico in the early 1990s. By the late 1990s, lower middle income countries- South Africa, Egypt, Peru, Philippines and low income countries - India, Indonesia also started using anti-dumping in a major way. While in 1980 only 4 countries reported anti-dumping initiations, in 1990 the number increased to 10. By 2000, 32 countries were reporting anti-dumping cases. Of these, 12 countries were upper income countries, 9 belonged to the middle income group, 5 were OECD and 3 each were low income and non-OECD developed countries. However the distribution of anti-dumping user countries has been

Table 3 : Top eleven anti-dumping users : 1996-2000

Country	% share in total cases	Rank in anti-dumping use	% share within the country group
<i>OECD</i>			
EU	14.0	1	34.0
US	12.5	2	30.0
Australia	8.0	5	20.0
Canada	5.0	7	12.0
Newzealand	2.0	11	4.0
<i>Upper middle</i>			
Argentina	8.0	6	31
Brazil	5.5	8	21
Mexico	3.0	9	12
Korea	2.7	10	11
<i>Lower middle</i>			
South Africa	10.0	4	62
<i>Low income</i>			
India	12.5	3	81

Source : Author's computations based on WTO Secretariat Rules division database

highly concentrated. Only 11 countries have been using anti-dumping actions actively (Table 3). These countries accounted for 80% of the total cases initiated during 1996-2000. Of these only 5 countries –India, Argentina, Mexico, Brazil and South Africa, belong to the developing country group.

The above analysis indicates that the surge in anti-dumping cases was indeed fuelled by the developing countries in the late 1990s but the use of anti-dumping mechanism was still not widespread among these countries. There is not, as yet, an explosion in the number of developing countries using the anti-dumping law. This however does not undermine the problem for two reasons. One, the adoption of anti-dumping mechanism by low and middle income countries suggests that it is the game that any country can play. Some believed that the fact that developing countries have shortage of skilled manpower, legal and administrative machinery would deter low income countries from opening such cases. However that does not seem to be the case. India had fewer than ten officials working on cases in their respective anti-dumping units in 1998 as compared to a figure of around 200 in the EU anti-dumping services. This however did not prevent India from becoming an increasingly significant user of anti-dumping. Two, trends of anti-dumping use suggest that once anti-dumping has been adopted by a country, it becomes difficult for it to reign in its use. Restraining its use would require bold initiatives that aim at changing the basic framework of the anti-dumping mechanism at the WTO level.

Success rates of anti-dumping initiations : by country-group

Table 4 presents success rates of anti-dumping initiations over the period 1980 to 2000 broken down by country group and time period. ‘Success rate’ of anti-dumping initiations is calculated as the ratio of definitive measures to initiations with one year lag. It represents the probability that an initiation ends in definite measure. Definite measures include anti-dumping duty and price undertakings both. Normally there is one year lag between initiation of an anti-dumping investigation and definite measure taken. For that reason, one year lag adjustment between initiations and measures was considered necessary. One would expect the success rate of anti-dumping initiations to be lower in developing countries. This is because conducting a full anti-dumping investigation requires, from the point of view of the investigating authorities, the commitment of much time, resources and labour. For developing countries in particular this may not be available. Our analysis also shows that the success rates for low and lower middle income countries are lower than those for upper middle and OECD countries. However, one may observe that the difference in success rates across different country groups is not very large. One must also observe that during the late 1990s, anti-dumping initiation success rates increased dramatically across all country

Table 4 : Success rates by country-group (1980 to 2000)

	1981-85	1986-90	1991-95	1996-00
Low	0	0	67	55
Middle	0	0	32	59
Upper	0	44	43	63
OECD	53	49	48	61
Non -OECD	0	0	30	61
Total	53	48	46	60

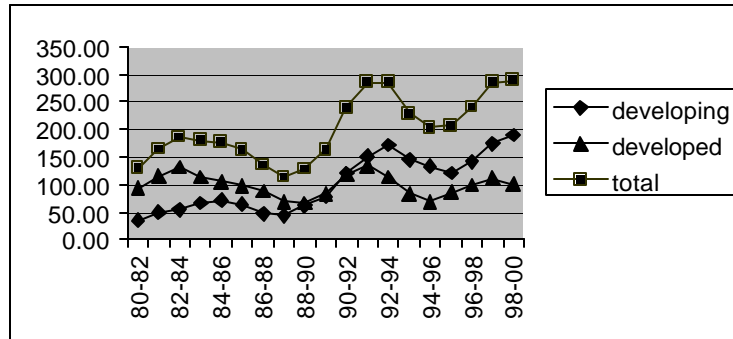
Source : Author's computations based on WTO Secretariat Rules division database

groups (except the low income country group). Several ambiguities in the legal provisions such as a number of allowable adjustments with limited interpretation; the use of constructed normal and export values, unrealistic adjustments use of surrogate country methodology for non-market economies, asymmetrical comparisons between the export and normal values introduce bias in favour of finding positive dumping margins. Determination of injury margin is subject to even more severe ambiguities and is highly discretionary. The administrative procedure is considered highly confidential increasing the risk of its misuse. It is quite at the discretion of the authorities to prove that dumping has occurred and that it has caused injury. It is therefore not surprising that the success rate shows small variation across different country groups and that it has increased dramatically in the Post Uruguay Round when countries across all groups are insisting on providing anti-dumping protection to their industries.

III.2 Targets

Fig 3 shows 3-yearly moving averages of anti-dumping cases broken down by targeted country group. Whilst the numbers of anti-dumping cases targeted against developed countries remained almost stable, those targeted against developing countries followed a consistent upward trend. By

Fig 3: Anti-dumping cases by targeted country group : 3 years' moving average



the late 1990s, more cases were targeted against developing countries than against developed countries. During 1996-2000 developed countries were targeted in 36% of the cases while 64% cases were opened against developing countries.

Among developing countries (Fig 4), the number of cases targeted against the bw and middle income country groups followed a strong upward movement. However, the increase in the number of cases against the upper income country group was not so dramatic and was marked by wide fluctuations.

Fig 4: Anti-Dumping targets within developing country groups (1980-2000)

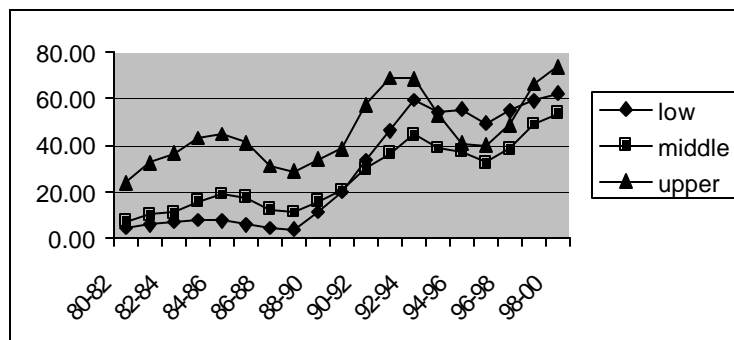


Table 5 provides summary information on anti-dumping actions broken down by targeted country group. It shows that in the early 1980s, around 60% of the anti-dumping cases were against OECD countries. Nearly 22% cases were reported against the upper middle income group of developing countries. Low and lower middle income country-groups together constituted around 12% of the cases. In the late 1980s, these patterns remained the same. In the early 1990s, however, there was a quantum jump in the number of cases targeted against low- and lower middle-income countries. While in the late 1980s, only 17.5% of the cases were directed against them, in the early 1990s, their share doubled to 34%. In contrast, the proportion of cases opened against upper middle income and OECD countries during this period declined. Post Uruguay Round period did not see reversal in this pattern. As a results, the proportion of anti-dumping cases targeted against low and lower middle income countries increased further. During 1996-2000, roughly 40% of the cases were against low and middle income countries alone. Upper middle and OECD countries were targeted in 22.5% and 30% of the cases, respectively.

**Table 5: Anti-dumping cases by targeted country group
(1979-80 to 1999-2000)**

(Number)				
	Number of cases			
year	1980-85	1986-90	1991-95	1996-00
<i>Developing countries</i>				
Low	37 (4.0)	42 (6.3)	240 (19.4)	303 (22.7)
Middle	70 (7.5)	75 (11.2)	183 (14.7)	232 (17.4)
Upper	210 (22.6)	171 (25.6)	288 (23.2)	301 (22.5)
<i>Developed countries</i>				
OECD	562 (59.5)	302 (45.2)	441 (35.5)	398 (29.8)
Non –OECD	60 (6.4)	78 (11.7)	88 (7.1)	101 (7.6)
Total	930 (100)	668 (100)	1240 (100)	1335 (100)

Note : Parentheses show the percentage of total cases

Source: Author's computations based on WTO Secretariat Rules division database

Our country level analysis of anti-dumping targets suggests that victims were more diverse than those victimising. In 1980, anti-dumping cases were targeted against 20 countries. The number of targeted countries increased to 76 by the late 1990s. This could partly be due to the break-up of Czechoslovakia, the USSR and Yugoslavia; however, mainly it shows that an increasing number of countries were becoming victims of anti-dumping measures (Miranda et al. 1998). In the low income group 10 countries were targeted in the late 1990s. The corresponding figures for the lower middle income group, upper middle income group, OECD and non OECD groups were 21, 18, 9, and 7, respectively.

Table 6 : Top targets in anti-dumping actions : (1996-2000)

Country	% share in total cases	Target Rank
<i>OECD</i>		
US	6.0	4
EU	17.6	1
Japan	4.6	6
<i>Upper middle</i>		
Korea	7.6	3
Brazil	3.1	9
Malaysia	1.9	11
Mexico	1.5	13
Turkey	1.5	14
Poland	1.3	15
Czech Rep.	1.0	17
<i>Lower middle</i>		
Russia	4.0	7
Thailand	3.4	8
Ukraine	2.2	10
South Africa	1.9	12
Romania	1.1	16
<i>Low income</i>		
China	13.6	2
India	4.0	7
Indonesia	4.0	7
<i>Non OECD</i>		
Taiwan	5.3	5

Source: Author's computations based on WTO Secretariat Rules division database

Table 6 suggests that the EU as a whole emerged as the most targeted region during the late 1990s followed by China. *Individually* however, China is most adversely affected country. Korea, US, Japan, Indonesia, India, Russia, and Thailand were other prominent targets of the anti-dumping tool. It is also interesting to note that East Asia and economies-in-transition were major victims of anti-dumping measures. During 1996-2000, nearly 50% of the total cases were initiated against these countries (Table 7). While Transition economies faced 26% of the total cases initiated, East Asian countries were not far behind with 24% of these cases.

Table 7: Anti-Dumping cases targeted against economies in transition and East Asia (1979-80 to 1999-2000)

(Number)

Country code	1980-85	1986-90	1991-95	1996-00
Transition economies	124 (13)	73 (11)	303 (24)	352 (26)
East Asian	114 (12)	141 (21)	240 (19)	315 (24)
Rest of the world	692 (75)	454 (68)	697 (56)	668 (50)
Grand Total	930 (100)	668 (100)	1240 (100)	1335 (100)

Note : Parentheses show the percentage of total cases

Source : Author's computations based on WTO Secretariat Rules division database

Economies in transition constitute Central and Eastern Europe, Erstwhile Soviet Union States, China and Vietnam. Their Non market economy status in many countries of the world is the decisive reason for a disproportionately high anti-dumping cases against these countries (see Aggarwal 2002 for the treatment with NMEs in anti-dumping investigations). Partly causing this trend is the presence of transition economies in the low and middle income county groups. The legal provision makes the non-market economies particularly vulnerable to dumping findings (see Tharakan 1994 for references). The ADA allows the investigating authorities to ignore the nominal prices or costs in the non-market economies and base the normal value estimated on the price or cost of a producer of the like product in an surrogate market economy "which may be regarded as a substitute for the purposes of the investigation. If the surrogate market economy is

highly protected/ the industry is highly concentrated/ it is at a high level of development than the defendant country then the constructed value is apt to be high and an affirmative finding is likely. In cases where the investigating country itself is the surrogate economy, finding dumping is almost a foregone conclusion. Econometric results support a hypothesis about discrimination against transition economies at the international trade markets (Oleksi and Shcherbakov,2001). The growth of anti-dumping investigations against East Asian countries may partly be attributed to the Asian financial crisis that started in April 1997. As domestic demand in South East Asia declined sharply, they directed their production into export markets. Rapid expansion of exports of East Asian countries during this period might be the reason why these countries became prominent victims of anti-dumping.

Success Rates: by targeted country group

The ratio of measures to anti-dumping cases opened by targeted country group and time period rate' is presented in Table 8. It can be seen that the proportion of anti-dumping cases contested successfully against low and lower middle income countries has consistently been higher than the average success rates. The success rate against OECD countries has always been lower than the overall average success rate. Clearly, low and lower middle income countries stand to loose in this game.

Table 8 : Success rates by targeted country (1980-2000)

	(%)			
	1980-85	1986-90	1991-95	1996-00
<i>Developing countries</i>				
Low	75.7	64.3	56.7	64.4
Lower middle	50.0	45.3	48.6	67.2
Upper middle	57.1	49.1	47.6	57.1
<i>Developed countries</i>				
OECD	50.6	49.0	40.6	55.3
Non OECD	61.7	38.5	36.4	62.4
Total	53.8	48.4	46.2	60.4

Source : Author's computations based on WTO database

Considerable time and expense are required by a company to defend itself against dumping charges (see Yano 1999). Firms from low and lower middle income countries are less equipped to cope up with these difficulties. Lack of expertise, lack of financial resources and lack of

manpower are some of the handicaps they face. As a result, many firms may choose not to defend. It is therefore expected that most cases contested against these countries are likely to result in definitive measures. There is another reason why low and lower middle income countries risk anti-dumping finding against them. Home market prices for domestically produced goods might be higher in these countries than those in the export markets. This could be due to inefficient cost structure or because of tariffs and fiscal taxes. Furthermore, most transition economies are in the low and lower middle income country groups. As discussed above, exporters from these economies are more vulnerable to affirmative findings. Therefore, the presence of these countries in the low and lower middle income groups could also have affected the success rates in these country groups.

One must however note here that even if the case is terminated without measures the exporter has to face considerable disruption to its trade, as well as the time and expense of defending itself. It is often argued that anti-dumping petitions have a profound impact on imports even if they do not result in duties (Staiger and Wolak,1994; Prusa,2001). Imports fall dramatically during the investigation period regardless of the case 's ultimate outcome. Legal scholars often refer to this as the 'harassment' effect of an anti-dumping investigation. Using extremely disaggregated trade data, Prusa (2001) found that even when an anti-dumping dispute was ultimately rejected, imports fell by 15-20 percent. It is therefore important to discourage the initiation of anti-dumping cases in the first place by making the filing conditions more stringent.

Confrontation ratio : by country group

We divided the number of cases initiated by each country group by the number of cases targeted against it. This ratio termed 'confrontation ratio' is presented in Table 9 broken down by time period. As can be seen, this ratio has always been greater than 1 for OECD countries . Clearly the number of cases initiated by them have been greater than the number of cases targeted against them in all time periods. For the upper middle income group, the ratio exceeded 1 during the 1990s. These were thus the least vulnerable country groups. In contrast, non OECD group appeared to be the most vulnerable group. It could perhaps be due to the presence of some East Asian economies in this group. It was followed by the low income and lower- middle- income group. An over time comparison however suggests that developing countries have also been

increasing confrontation over time. The number of cases initiated by them has been increasing faster than the number of cases targeted against them.

Table 9 : Confrontation Ratio : by country group (1980-2000)

	Ratio of anti-dumping cases initiated against each country-group to cases reported by it			
Developing countries				
Low	0	0	0.09	0.69
Lower middle	0	0	0.36	0.92
Upper middle	0	0.38	1.28	1.15
Developed countries				
OECD	1.65	1.96	1.76	1.38
Non OECD	0	0	0.11	0.18

Source : Author's computations based on WTO Secretariat Rules division database

III.3 Who targets whom : analysis by country group

Table 10 relates initiating and targeted countries. The top row indicates countries initiating anti-dumping cases while the first column shows countries targeted by their investigations. During 1980-

Table 10 : Anti-dumping initiations by targeted country group (1980-2000)

Initiating countries → targets ↓	Low	Lower middle	Upper middle	OECD	Non OECD
Low	55 (24)	61 (22)	156 (20)	349 (12)	1 (4)
Lower middle	37 (16)	38 (14)	124 (16)	361 (13)	0 (0)
Upper middle	44 (19)	64 (23)	172 (22)	683 (24)	7 (25)
OECD	76 (33)	96 (34)	289 (37)	1213 (42)	20 (71)
Non OECD	18 (8)	20 (7)	36 (5)	253 (9)	0 (0)
grand total	230 (100)	279 (100)	777 (100)	2859 (100)	28 (100)

Note : Parentheses show the percentage of total cases

Source : Author's computations based on WTO Secretariat Rules division database

2000, developing countries together launched 1286 cases, out of which around 58% were against other developing countries, 36% of them were against OECD countries and the rest (6%) were against non OECD developed countries. Individually, the proportions of total cases launched by low income, lower middle income and upper middle income countries against other developing countries were 59%, 59% and 58% respectively. Nearly 37% of the cases initiated by low and lower middle income countries were against their low- and lower-middle income country counterparts. OECD countries, on the other hand, targeted 49% of the cases against developing countries and 51% against developed countries (including non OECD countries). One fourth of the total cases launched by OECD countries were against low and middle income countries.

Thus, developing countries targeted a majority of cases against other developing countries while developed countries also directed a large number of investigations against these countries. Developing countries being the soft targets, it was not an unexpected result. Some argue that as long as the traditional users continue to use it against the developing countries, anti-dumping instrument is useful for developing countries to have the ability to hit back (see for instance Vermulst 1997). However, it is a matter of concern that there have been substantial intra low- and lower middle income country group filings. This may be attributable in part to the fact that exports from countries with the same level of development compete heavily with domestic production in importing countries as both enjoy comparative advantages in similar lines of production.

Table 11 investigates the patterns of anti-dumping targets by initiating country group. It shows that 65% of the cases directed against developing countries were initiated by OECD countries. In contrast, only 27% of the cases targeted against OECD countries were filed by developing countries. Low and lower middle income countries filed only 10% of the cases against these countries. Thus, OECD countries were targeted mainly by other OECD countries while developing countries were targeted principally by OECD countries. One could suggest that the rise in the cases reported by low and middle income counties in the late 1990s might be partly an expression of retaliation. Prusa and Skeath (2002) in an empirical study also revealed that nearly 90% of the cases over the period 1980-98 in which traditional users (EU, Australia, US and Canada) were investigated were initiated by countries that had a retaliation incentives. The fact

that so many anti-dumping cases initiated by new users are motivated by retaliatory considerations indicates that anti-dumping may be an instrument wielded by a few countries at present but its use will spread in future with more and more victimised countries initiating cases against those victimising.

Table 11 : Anti-dumping Targets: by initiating country group 1980-2000

Targeted → Initiating↓	low	Lower middle	upper middle	OECD	Non OECD
Low	55	37	44	76	18
	(8.8)	(6.6)	(4.5)	(4.5)	(5.5)
Lower middle	61	38	64	96	20
	(9.8)	(6.8)	(6.6)	(5.7)	(6.1)
Upper middle	156	124	172	289	36
	(25.1)	(22.1)	(17.7)	(17.1)	(11.0)
OECD	349	361	683	1213	253
	(56.1)	(64.5)	(70.4)	(71.6)	(77.4)
Non OECD	1	0	7	20	0
	(0.2)	(0.0)	(0.7)	(1.2)	(0.0)
Total	622	560	970	1694	327
	(100)	(100)	(100)	(100)	(100)

Note : Parentheses show the percentage of total cases

Source : Author's computations based on WTO Secretariat Rules division database

III.4 Anti-dumping cases by Sector

A sectoral breakdown of global anti-dumping initiations is shown in Table 12. It is evident that the majority of cases were initiated in the resource intensive and science based sectors. Within the resource intensive sector, base metals was the leading sector targeted. This could be due to a very high incidence of anti-dumping filings in the steel industry. In the science based sector, scale intensive - chemicals, plastic and rubber dominated anti-dumping filings over the period 1980-2000. Why dumping cases tend to be concentrated in these sectors? Miranda et. al (1998) argued that 'the world markets for steel, base chemicals and plastics are highly cyclical. Thus, at the bottom of a cycle, firms operating in these markets may turn to pricing sales below cost' (p. 16). It is also possible however that at the downturn, domestic firms in importing countries use anti-dumping law to protect themselves and since there is a very high probability of affirmative injury findings during this period, they rush to file anti-dumping cases.

Table 12 also documents an obvious shift away from science based sectors to resource and labour intensive sectors during the early 1990s. Resource and labour sectors accounted for less than 50% of the cases in the 1980s, their share increased to roughly 60% in the 1990s. In contrast, the share of science based sectors declined sharply from 51% in the late 1980s to 40%. Even within the science based sector, there was a sharp decline in the proportion of cases initiated in the differentiated sector. The share of the scale intensive sector increased sharply. This shift could be due to increasing participation of developing countries in anti-dumping mechanism both as initiating and targeted countries.

Table 12 : Anti-dumping cases by sector (1980-2000)

	80-84	85-89	90-94	95-00
Resource Intensive	293 (40)	283 (40)	587 (47)	706 (47)
Base metals & products	213 (29)	168 (24)	374 (30)	453 (30)
L-intensive	64 (9)	51 (7)	149 (12)	160 (11)
Textiles	45 (6)	30 (4)	100 (8)	106 (7)
Science Based	333 (46)	360 (51)	503 (40)	612 (41)
Scale intensive	216 (30)	171 (24)	347 (28)	414 (28)
Differentiated	105 (15)	170 (24)	140 (11)	177 (12)
Misc.	34 (5)	15 (2)	10 (1)	13 (1)

Note : Parentheses show the percentage of total cases

Source : Author's computations based on WTO Secretariat Rules division database

Anti-Dumping cases by sector and initiating country group

Table 13 shows the sectoral distribution of anti-dumping initiations within each country group over the period 1980-2000. Two observations may be made. *First*, resource intensive and science based sectors dominated anti-dumping filings in all country groups. *Second*, low income countries initiated a higher proportion of cases in science based sectors (61% of the total) than in resource intensive sectors (22%). Lower middle income countries reported almost the same

proportion of cases in both these sectors while upper middle, OECD and non OECD developed countries reported a larger proportion of cases in resource intensive sectors than in science based sectors. These trends can be explained within the framework of the theory of comparative advantages. Apparently, countries used the anti-dumping mechanism to protect the industries where they did not have comparative advantages.

Table 13 : Sectoral distribution of Anti-dumping cases : by country group (1980-2000)

	low	Lower middle	Upper middle	OECD	Non Oecd
Resource intensive	51 (22.2)	129 (46.2)	347 (44.7)	1324 (46.3)	18 (64.3)
Labour intensive	33 (14.3)	21 (7.5)	112 (14.4)	254 (8.9)	4 (14.3)
Science based	141 (61.3)	129 (46.2)	314 (40.4)	1219 (42.6)	5 (17.9)
Scale intensive	121 (52.6)	112 (40.1)	225 (29.0)	755 (26.4)	3 (10.7)
Differentiated	20 (8.7)	17 (6.1)	89 (11.5)	464 (16.2)	2 (7.1)
Miscellaneous	5 (2.2)	0 (0.0)	4 (0.5)	62 (2.2)	1 (3.6)
Total	230	279	777	2859	28

Note : Parentheses show the percentage of total cases

Source : Author's computations based on WTO Secretariat Rules division database

Anti-Dumping cases by sector and by targeted country group

Table 14 shows the sectoral distribution of anti-dumping initiations within each targeted country group. In low and lower middle income countries resource and labour intensive sectors were targeted most frequently. Taken together, in developing countries these sectors were targeted in roughly 55 per cent to 70 per cent of the total anti-dumping cases. In developed countries (both OECD and non OECD), however, science based sectors were the most frequently targeted sectors. More than 50 per cent of the cases targeted against non OECD developed countries were filed in this sector alone. The frequency with which 'differentiated sectors' were targeted across different country groups was also relatively high for countries with high level of development. Evidently, countries were targeted in the sectors where they had comparative advantage.

Table 14 : Distribution of Anti-dumping cases by sector and targeted country group (1980-2000)

	Low	Lower middle	Upper middle	OECD	Non OECD
Resource intensive	236 (37.9)	336 (60.0)	447 (46.9)	742 (43.4)	108 (33.0)
Labour intensive	143 (23.0)	47 (8.4)	100 (10.5)	88 (5.1)	46 (14.1)
Science based*	234 (37.6)	176 (31.4)	398 (41.7)	833 (48.7)	167 (51.1)
Scale intensive	173 (27.8)	139 (24.8)	251 (26.3)	554 (32.4)	99 (30.3)
Differentiated	61 (9.8)	37 (6.6)	147 (15.4)	279 (16.3)	68 (20.8)
Miscellaneous	9 (1.4)	1 (0.2)	9 (0.9)	47 (2.7)	6 (1.8)
Total	622 (100)	560 (100)	954 (100)	1710 (100)	327 (100)

* Science based comprises of scale intensive and differentiated sectors; Parentheses show the percentage of total cases

Source : Author's computations based on WTO Secretariat Rules division database

With these clear cut patterns emerging, it is becoming increasingly difficult to argue that anti-dumping use signals merely an increase in unfair trade practices. This raises an obvious question as to what factors explain the use of the anti-dumping mechanism. In what follows we analyse the macroeconomic determinants of anti-dumping initiations.

IV. Empirical analysis of macroeconomic determinants of anti-dumping initiations

This section is organised into 3 subsections. Section IV.1 provides the theoretical underpinning for the analysis and formulates hypotheses. Section IV.2 describes data and methodology and Section IV.3 discusses empirical results.

IV.1 Motivation for Anti-dumping use: Theoretical underpinning

The standard theoretical explanation for the anti-dumping use is based on the view that anti-dumping is a response to unfair trade practice. Government-imposed home market trade barriers and government-tolerated anti competitive activities permit domestic producers to create

monopolies in their home markets. This enables them to charge low prices in export markets and compensate the loss by charging higher prices in the domestic markets without attracting foreign entry. The anti-dumping rules are a practical response to these trade-distorting policies. From this perspective, dumping is always a unfair trade practice and anti-dumping is used by producers in the importing country to offset, quantitatively, the artificial advantages realized by the exporting country's producers so that they may compete on an equal footing with the exporting country's producers. Economists endorse the basic argument provided in this standard framework and admit that anti-dumping is a trade- corrective measure. However, they argue that dumping is not always a unfair trade practice nor it is harmful for the society unless it is done with predatory intent (see for instance Deardorff 1993, Willig 1998, Messerlin and Tharakan 1999, Hindley 1991, Aggarwal 2002). Prevention of predatory pricing, they argue, is the economic justification of anti-dumping use. Predatory pricing is pricing designed to achieve or exploit monopoly power; restrict competition in importing country and injure consumers through monopoly pricing in the long run. The anti-dumping law is a bulwark against such anti competitive practices of foreign exporters. Following the thinking in antitrust literature, economists view anti-dumping as a tool to promote and protect competition in international trade.

The political economy approach (See Tharakan 1995) however argues that anti-dumping use is not motivated by anything other than protectionism. This argument begins with the premise that free trade does not bring unambiguous gains to all sections of the society. It implies gains for some while loses for others. Since those who gain are not capable of compensating those who lose, there are protectionist pressures in the economy. Pressure groups constitute domestic producers in import competing industries who are likely to lose from free trade. These producers lobby to strive for protection. In doing so they find anti-dumping the most potent tool of protection. Dumping and injury findings are almost at the discretion of the authorities. Once an application is made domestic firms face a high probability of obtaining protection⁴. Theoretical

⁴ Low (1993) states 'virtually any industry that considers itself adversely affected by foreign competition and presents a competently assembled petition, stands a good chance demonstrating that it is under attack ' (p. 86).

and empirical literature suggests that even if no dumping is finally found, the initiation of investigations itself results in imports fall⁵.

The national authority investigates the veracity of the claims made by domestic producers and decides whether to initiate the case. Governments, it is argued, favour protectionist interests (Caves 1976 Baldwin 1984, O'Rourke and Sinnott 2001). From the governments' perspective, anti-dumping law provides a low visibility non transparent protection tool for responding to protectionist demands by domestic producers. anti-dumping practices are targeted at firms not governments (unlike CVD) and are therefore not required to be imposed on a most-favoured nation basis (unlike safeguard measures). These characteristics make anti-dumping politically least visible contingent protection measure. Hence the governments readily tend to support the use of GATT compatible anti-dumping mechanism⁶.

Consumers who lose from protection are marginalised in the system. The WTO agreement does not require a public interest test for imposing anti-dumping duty. The anti-dumping law in most countries does not define or elaborate on public interest and leaves the matter at the discretion of the authority. Even in countries which have provisions for community interest clause it has been observed that the clause rarely led to a decision not to impose duties in instances where dumping and injury was found to exist (Hoekman and Mavroidis 1996, Leclerc 1999)⁷. It could be because consumers are less organised and less influential (Tharakan 1995). Moreover, their individual losses may not be great enough to induce them to organise.

This school thus focuses on the factors that influence the rent seeking pressures and authorities' willingness to oblige them. These could be industry specific or macroeconomic factors. Industrial downturn, unemployment, balance of payment pressures and trade liberalisation are

⁵ In an econometric analysis Prusa (1999) found that imports fell on average by 15-20 per cent where investigations were dismissed

⁶ In India, over the period from 1992-93 to 2002-03, 175 petitions were made. The Directorate General of anti-dumping and Allied Duties initiated investigations into 153 cases

⁷ Leclerc (1999) revealed that in Canada, between 1992 and 1997 only five public interest inquiries were held but none of them resulted in the tribunal reversing its initial decision to impose anti-dumping duties. In the EU, by the year 2000 there were two cases where the authority had concluded that community interest did not justify the imposition of duty. In Australia, however there have cases where anti-dumping duties could have been imposed but since taking action was not in the interest of the public, exporters were given only warning

some *macro economic* factors while the level of industrial concentration, capital intensity, profit rates and capacity utilisation are industry specific factors.

We analyse the use of anti-dumping within the realm of the political economy approach. While doing so, we focus on the effect of macro factors in influencing aggregate anti-dumping filings across countries. Our hypotheses are as follows.

(a) Macro Economic Pressures

Domestic macroeconomic conditions : If the macroeconomic environment is sluggish any import competition may put further downward pressure on the capacity utilisation, profit margins and employment. Besides, under such circumstances, the probability of an affirmative material injury finding also increases. Domestic producers therefore lobby and pressurise the government to provide protection to the domestic industry. Authorities respond leniently to the emotionally compelling argument that foreigners are behaving unfairly, to shift focus of attention from the shortcoming of the domestic industry to the unfair trade practices of foreign firms. Our first hypothesis therefore is as follows.

Hypothesis 1: Low levels of domestic activity influence the anti-dumping use positively. Countries that have been undergoing recessionary conditions file more anti-dumping cases.

The model includes growth rate in industrial value addition (IVAGR) to test the above hypothesis.

Balance of payment conditions : Import surge and adverse trade balances may independently influence the decisions to use anti-dumping measures. Adverse trade balances increase the probability that authorities would readily accept a complaint. Though safeguard (SG) measures are available to meet such contingencies, their use has been highly restricted. The reasons are discussed in detail in the concluding part of the study. In brief one may argue that SG measures are applied under the recognition that the domestic industry needs to undergo adjustments while anti-dumping puts the blame on unfair trade practices by foreign exporters.

Hypothesis 2: The number of anti-dumping cases per year is related to a widening in the trade deficit and import surge.

Two trade related variables namely, trade balance as a ratio of total trade (TRBAL) and import growth rate (Imgrth) are used in the analysis. While the former is expected to have negative relationship with anti-dumping filings, the latter will have positive relation ship.

(b) Trade liberalisation

Some trade negotiators view anti-dumping as a price paid to sustain the overall consensus in favor of an open trading system. They argue that the necessity of having an effective anti-dumping remedy increases as a country liberalizes as a matter of political necessity and because the prospect of injurious dumping becomes real. Findings in systematic analyses of individual preferences on trade and their underlying determinants based on the cross-country data set put together by the International Social Survey Programme (ISSP), suggest that trade patriotism and chauvinism are strongly related with protectionist attitude (O'Rourke and Sinnott 2001). Mayda and Rodrik (2001) reported that when asked about their views on trade, typically sixty percent or more of respondents in opinion polls express anti-trade views. Such preferences matter in trade policies as the politicians resist initiatives that are against public opinion. The use of anti-dumping assist governments in their efforts to continue trade liberalising measures by ensuring relief to domestic industries in case they are injured due to import surge. Thus, when tariff rates are reduced authorities adopt a lenient view towards initiating anti-dumping cases. A review of the anti-dumping cases initiated by the EC from 1980 to 1997 (Bourgeois and Messerlin 1998) demonstrates that the industries most frequently involved are those that have a low MFN tariff.

Hypothesis 3: anti-dumping initiations are inversely related with tariff rates. Countries lowering their tariff barriers are the active users of anti-dumping

We include average tariff rate (TARIFF) in the model to test the above hypothesis.

(c) Capacity building for posing retaliation threat

Some scholars argue that one of the motives for initiating anti-dumping cases might be retaliation (Finger 1981). There are several instances of retaliatory use of anti-dumping among developed countries (Blonigen and Bown 2003). Prusa and Skeath (2002) find evidence consistent with “tit-for-tat” retaliatory anti-dumping actions for both developed and developing countries. In general, retaliation refers to countries filing anti-dumping actions specifically against those countries that have named it in the past. In this study however, we argue that countries tend to file more anti-dumping cases if they have been subject to such investigations in general in the past. There is evidence (Prusa and Skeath 2002) that all new users with few exceptions were subject to anti-dumping investigations before they started reporting anti-dumping cases themselves. Almost two-thirds of the new users were subject to at least 10 cases. Some countries, such as Korea (40 cases) and Brazil (55 cases) were named in several cases. It could be that these countries felt the need for developing capability to retaliate so as to discourage the use of anti-dumping against them.

Hypothesis 4 : Anti-dumping filing in a country is positively related with the number of cases initiated against the country in the past.

It is expected that the number of cases filed against a country in the past (AFF) influence their decisions to initiate case in time period t .

IV.2 Data and Methodology

For testing the above hypotheses, we required data on anti-dumping initiations and macro economic variables in each country on an annual basis for the period from 1980 to 2000. We constructed the data set by combining the WTO data on the number of anti-dumping initiations per year by reporting country with the data on macro economic variables provided by the ‘World Bank’ in World Development Indicators CD-ROM’. We thus had a panel data set of 99 countries over the period 1980-2000 (21 years). For the empirical analysis, we classified reporting

developing countries into two categories : low and middle income countries and upper income countries. The classification as described above was adopted from the World Bank (2000).

For the empirical analysis, it was important to decide the lag structure of the regressors. Normally, reporting countries analyse the pricing behaviour of foreign firms over the year prior to the filing of the case. This is termed investigation period (IP). Injury is analysed over a period of at least three years. This period is often called the injury investigation period [IIP]. However, such a relatively long period is used particularly to establish causation. As a matter of practice, the industry must be suffering material injury during the regular investigation period (IP) and detailed injury margin calculations are based on the data existing during the regular investigation period which is one year preceding the anti-dumping application. It was therefore decided to use the macro economic regressors with one year lag. Tariff rate is however the rate prevailing at the beginning of the year.

Our model thus is,

$$ADINI_t = f(GNPGR_{t-1} / IVAGR_{t-1}, TRBAL_{t-1}, IMGRTH_{t-1} / IMPENEGR_{t-1}, TAR_t, AFF_{t-1})$$

$ADINI_t$ denotes the number of anti-dumping filings in the year t .

Since the dependent variable is a non-negative discrete variable, we have employed count models for estimation. The Poisson regression model, a non linear model, is widely used for such data. The distribution takes the following form.

$$\text{Prob}(Y=y_{it}) = (\exp(-\lambda_{it}) \lambda_{it}^{y_{it}}) / y_{it}! \quad y_{it} = 1, 2, 3, \dots$$

Where,

$$E(y_{it}) = \lambda_{it} \text{ and } V(y_{it}) = \lambda_{it}$$

Typically, the poisson regression model is given by

$$\log \lambda = X\beta$$

β is estimated either by an iterative nonlinear weighted least square method or by a maximum likelihood method. Coefficients reported by poisson may be transformed to incidence rate ratio (

the rate per unit of time at which happenings occur). The incidence rate for the observation v_i is assumed to be given by :

$$v_i = e^{X\beta}$$

The expected number of occurrences is equal to this incidence rate multiplied by the exposure. The distribution is estimated by maximum likelihood.

The poisson maximum likelihood estimator is consistent and efficient provided the mean is equal to the variance. However, it is not uncommon to find *over dispersion* where the variance of observed counts is larger than the mean empirically. A common alternative suggested for poisson model in this case is the *Negative binomial model* which allows for over dispersion. It is derived by generalizing the Poisson model by introducing an individual, unobserved effect into the conditional mean μ_i such that

$$\log \mu_{it} = \log \lambda_{it} + \log u_{it}$$

The non negative binomial takes the form,

$$\log \mu_{it} = x_{it} \beta + e_{it}$$

where e_{it} reflects either specification error or cross sectional heterogeneity and $\exp(e_{it})$ is gamma distributed. The distribution of y_{it} conditional on x_i and u_i remains Poisson with conditional mean and variance μ_{it} :

$$f(y_{it} | x_{it}, u_{it}) = ((\exp(-\lambda_{it} u_{it})) (\lambda_{it} u_{it})^{y_{it}}) / y_{it} !$$

The distribution has mean λ and variance $(\lambda + 1/\theta)$.

For statistical testing of over dispersion, we began by estimating the Poisson model. The goodness of fit statistics provided by the poisson model estimates however suggested that we

could reject that the data were Poisson distributed at the 1% level for each model. This was due to over dispersion of the data. We therefore reported results based on the negative binomial specification. Coefficients reported by the negative binomial model may also be transformed to incidence rate ratio. The expected number of occurrences is equal to this incidence rate multiplied by the exposure . Since each observation in the data set is the number of anti-dumping initiations in a one year interval, the exposure in our estimation is taken to be 1.

Since we have panel data with i countries over T years, it is not inappropriate to assume that unobserved country-specific effects exist. In order to add firm specific effects to the negative binomial model we could employed two methods : random effects and fixed effects. Fixed effect models truncated the sample by dropping observations for all those countries that never reported anti-dumping cases or reported them only once. We considered it appropriate to report estimates based on both random effects and fixed effect specifications to examine the sensitivity of our results to the sample and model specification.

IV.3 Empirical Results

Tables 15 and 16 report empirical results based on the random and fixed effect specifications. Equations 1&2 are based on the data from the combined low and lower middle income countries while equations 3 and 4 are estimated for the upper income countries. Equations 5 &6 are based on the data pooled for all groups of developing countries. Equations 7 &8 provide results for the OECD country group. Since observations in the NONOECD country groups were very small, no separate regression was estimated for this group. However, in one of the specifications (Equation 9), the data from both OECD and NONOECD country-groups were pooled in a single regression equation to estimate the results for the developed countries. Different specifications of the model were used to avoid multicollinearity (see the Appendix for correlation matrices). Our results are remarkably robust to changes in the underlying model specification and sample coverage. It is important to note here that the coefficients reported are ‘incidence rate ratio’ (IRR). If the IRR is 1.40, then a one percentage point change in the explanatory variable would increase counts by 40%. IRR exceeds one for the variables having positive relationship with the

dependent variable; it is smaller than one (showing decline) for the variables with negative signs.

Our findings for the developing countries pooled in one group suggest that anti-dumping initiations increase substantially when there are trade balance pressures. It is found that a one percentage-point decline in trade balance (TRBAL) leads to a 2% increase in the number of anti-dumping filing. Import growth rate has similar effects. Once we distinguish between the upper and low income country groups, however, we find that results differ across two groups of countries. For the upper income country group, IMGRTH emerges significant at 1% while TRBAL is insignificant. Even when IMGRTH was dropped TRBAL did not become significant. In low and lower middle income countries however, both trade related variables appear to have significant impact on anti-dumping filings. Trade related pressures therefore seem to be a major concern for low and lower middle income countries in using anti-dumping measures. In OECD countries, external pressures approximated by the international trade position (TRBAL) were insignificant in all specifications. Import variables IMGRTH emerged at 1 per cent in the presence of IVAGR. It could also be observed that 1 percent increase in IMGRTH was associated with 2-3 percent increase in anti-dumping filings. However, once IVAGR is dropped its significance reduced considerable. Evidently, the impact of import surge becomes significant after controlling the effect of IVAGR. It could be that in developed countries, import competition is more readily accommodated when the market is expanding but producers tend to guard their market share when the rate of expansion slows. When economic growth is sluggish, returns from investing resources in seeking protection are seen to be higher than in investing in production activities. External pressures are shown to be unimportant for developed countries (Leidy 1997, Becker and Theuringer 2001). Knetter and Prusa (2003) used larger data database and found exchange rate appreciation to affect anti-dumping filings positively in the presence of the growth rate in GDP. Our results also suggest that import surge has a positive impact on anti-dumping filings. But its weakens once the growth rate in industrial value addition is dropped.

For developed countries anti-dumping initiations appear to be largely motivated by domestic macroeconomic pressures. Anti-dumping initiations are inversely related with the industrial growth all specifications for the OECD/ developed countries. A one percentage point decline in

the industrial growth rate leads to a 6-7% increase in the number of anti-dumping initiations. This variable did not turn out to be significant for developing countries. The existing empirical literature documents a significant influence of domestic macroeconomic pressures on the use of anti-dumping in OECD countries (Leidy 1997 Becker and Theuringer 2001, Knetter and Prusa 2003).

Turning to the tariff rates (TARIFF), the results indicate quite a robust negative significance for both developing country groups and hence for the pooled group. A one percentage point decline in tariff rates leads to 10-12 percent, 5-7 percent and 8 percent increase in anti-dumping initiations in upper middle income, low and lower middle income countries and all developing countries, respectively. Results are quite expected. Till recently, companies in most developing countries had been operating in highly protected markets. Overprotection over a long period of time bred inefficiency. Therefore, the shift in favour of competition-enhancing policies in these countries in the 1990s, appear to have resulted in pressures from the domestic industry to provide protection to be able to face international competition. Authorities also seem to adopt a lenient view in granting contingent protection in order to avoid some of the adverse effects of liberalisation and in order to reassure domestic political interests that some form of 'safety net' remains in place. In developed countries, TARIFF is insignificant in all specifications for OECD/developed countries.

Table 15 : Determinants of the number of anti-dumping initiations : Negative binomial regression random effect model

	Low & middle income group countries		Upper income group countries		All developing countries	OECD		All developed countries	
	(1)	(2)	(3)	(4)	(5)	(7)	(8)	(9)	(10)
AFF	1.167 (5.19) ^a	1.141 (5.04) ^a	1.051 (2.393) ^b	1.05 (2.261) ^b	1.110 (6.588) ^a	1.011 (1.756) ^c	1.009 (1.81) ^c	1.010 (1.541)	1.008 (1.377)
TARIFF	0.934 (-2.61) ^a	0.956 (-2.053) ^b	0.898 (-3.05) ^a	0.890 (-3.326) ^a	.917 (-4.711) ^a	1.179 (1.658) ^c	1.044 (1.417)	1.048 (0.413)	.881 (-1.505)
TRBAL	0.978 (-1.88) ^c		0.991 (-.987)	.994 (-.579)	.983 (-2.580) ^b	1.012 (.565)	1.005 (.225)	1.014 (.680)	.005 (0.448)
IMGRTH	1.017 (1.703) ^c	1.018 (1.798) ^c	1.015 (2.653) ^a		1.018 (3.826) ^a	1.026 (2.842) ^a	1.014 (1.475)	1.024 (2.692) ^a	1.014 (1.301)
IVAGR	0.981 (-1.055)	.974 (-.908)	0.984 (-.608)	1.024 (1.115)	.984 (-1.614)	0.935 (-2.98) ^a		0.937 (-2.71) ^b	-
/ln_r	-0.925	-0.929	-0.456	-0.371	-0.773	-0.364	-0.583	-0.449	-.477
/ln_s	-2.333	-2.178	-0.249	.059	-1.555	0.036	-.531	-.483	-.571
Loglikeliho od	-258.90	-270.06	-315.06	-322.95	-587.26	-320.51	-449.35	-334.41	-492.45
Wald chi2	38.82	38.93	75.22	72.94	91.40	23.85	20.10	22.84	32.45
No of obs	431	431	207	219	638	126	174	156	232

^a significant at 1%, ^b significant at 5% and ^c significant at 10%.

Table 16 : Determinants of the number of anti-dumping initiations : Negative binomial regression fixed effect model (truncated sample)

	Low & middle income group countries		Upper income group countries		All developing countries	OECD		All developed countries	
	(1)	(2)	(3)	(4)	(5)	(7)	(8)	(9)	(10)
AFF	1.114 (3.041) ^a	1.123 (3.350) ^a	1.054 (2.395) ^b	1.044 (2.021) ^b	1.075 (4.274) ^b	1.010 (1.654) ^c	1.009 (1.707) ^c	1.011 (1.68) ^c	1.008 (1.332)
TARIFF	0.931 (-2.654) ^a	0.934 (-2.573) ^b	0.890 (-3.205) ^a	.889 (-3.318) ^a	.923 (-4.232) ^a	1.159 (1.351)	1.035 (.399)	1.141 (1.210)	.890 (-1.273)
TRBAL	0.980 (-1.652) ^c	0.979 (-1.85) ^c	0.987 (-1.399)	.994 (-.579)	.986 (-2.071) ^b	1.022 (.972)	1.005 (.344)	1.019 (.843)	1.005 (0.359)
IMGRTH	1.017 (1.603)		1.017 (2.845) ^a	1.017 (2.893) ^a		1.026 (2.772) ^a	1.014 (1.834) ^c	1.026 (2.815) ^a	1.014 (1.384)
IVAGR	0.971 (-.934)	.992 (-.294)	0.968 (-1.170)	.975 (-.929)	1.001 (.101)	0.952 (-1.89) ^b		0.954 (-2.69) ^a	-
Loglikeliho od	-188.85	-270.06	-250.46	-251.48	-453.26	-263.51	-386.58	-269.39	-417.45
Wald chi2	64.40	38.93	70.80	72.39	136.40	20.59	18.10	20.84	28.45
No of obs	149	157	169	169	318	109	143	130	183

^a significant at 1%, ^b significant at 5% and ^c significant at 10%.

Finally, our results support the capacity creation hypothesis for the anti-dumping initiations in developing countries. AFF is significant at 1 % significance level in all specification for the developing country groups. For low and lower middle income countries this seems to be the most important variable resulting in 14-16 per cent increase in anti-dumping initiations with every one percent increase in anti-dumping cases reported against them. The results are less pronounced for upper middle income countries while for OECD (developed) countries, it is insignificant in all equations. Prusa and Skeath (2002) carried out non parametric tests and observed that new users' (mainly developing countries) anti-dumping initiations are more often consistent with the retaliation motive than those of traditional users. Apparently, the use of anti-dumping measures against developing countries motivates them to use similar policies against other countries. This helps them in creating capacity to use these measures and pose retaliations threats that may dampen such activity against them. In an important study Blonigen and Bown (2003) have argued that the capacity to retaliate may have dampening effects on anti-dumping activities of trading partners. Perhaps the use of anti-dumping helps them in acquiring anti-dumping capabilities and posing retaliation threat to counter such activities against them. One may thus suggest that increased anti-dumping familiarity and ability across developing countries may ultimately help put the brakes on anti-dumping use by traditional users. However, this may also result in anti-dumping wars reversing trade liberalisation gains. This may therefore prove to be a costly strategy to restrain the anti-dumping use.

V Conclusion and Policy implications

Anti-dumping emerged as a global phenomenon in the past decade and is now used extensively by developed and developing countries alike. This study shows that the total number of cases being opened throughout the world is increasing rapidly. Moreover, there has been a significant change in the patterns of anti-dumping activity over the period of past 20 years. Our study shows a massive shift away from developed to developing countries. In the 1990s, the surge in anti-dumping cases was fuelled by developing countries when the number of anti-dumping cases sharply increased among all categories of these countries. The number of cases targeted against developing countries also increased sharply in the 1990s. In fact the number of cases initiated against low and lower middle income countries increased faster than the number of cases

initiated by them. Transition economies and East Asian countries were found to be worst hit by anti-dumping use. This is the natural outcome of the legal provisions that make the non-market economies more vulnerable to dumping findings. It was also observed that there was a distinct rise in the success rates of anti-dumping initiations during the late 1990s in all country-groups. Evidence suggests that low and middle income developing countries were targeted mainly by OECD countries while they themselves were targeting other developing countries. Analysis of sectoral patterns of anti-dumping initiations suggests that a majority of cases were initiated in resource intensive and science based sectors. Base metals was the leading resource intensive sector targeted. This could be due to a very high incidence of anti-dumping filings in the steel industry. In the science based sector, scale intensive - chemicals, plastic and rubber dominated anti-dumping filings over the period 1980-2000. The study also observes that countries were targeted primarily in the sectors where they had comparative advantage and they tended to use this mechanism primarily in the sectors where they did not have comparative advantage. With these clearcut patterns emerging, it is becoming increasingly difficult to argue that anti-dumping is a trade correcting tool. This study found that the use of anti-dumping measures is significantly explained by macro variables. In developed countries, anti-dumping is primarily used as an import-deterrent device during business downswing. It appears that when on the upturn of business cycles firms in these countries are not significantly concerned with import competition. However when on the downswing they strive for anti-dumping protection from import competition. In developing countries that are evolving from a controlled to a more liberal trading regime, anti-dumping appears to serve as a tool in enabling governments to open up their economies. The rise in the number of anti-dumping initiations by developing countries may partly be an expression of retaliation. Using the anti-dumping law enables them to create ability to counter such actions targeted against them. External pressures such as import penetration and balance of payment deficits also exert considerable influence on the use of anti-dumping in these countries.

Empirical evidence presented in the study has important implications. First, it reinforces the view that the primary jurisdiction for the anti-dumping law is really more political than economic. Clearly, anti-dumping measures have gone beyond punishing unfair trade practices and creating a level playing field as claimed by the national anti-dumping authorities. These have been used to protect the domestic industry. Even though the GATT designed safeguard protection also, it does

not have the AD's unique combination of economic and political manipulability. The use of anti-dumping is fraught with several ambiguities and is amenable to misuse, which makes anti-dumping duty highly discriminatory in nature. Once the anti-dumping case is filed the decision to grant protection is subject to substantial discretion and hence can be influenced by the involved parties. On the other hand, the use of SG is permitted when there is an import surge or increase in the imports' share of a shrinking market which threatens serious injury to domestic producers. Thus the use of this tool is not based on the proof of unfair trade practices by foreign firms. The key issue is whether the local economy is subject injury due to trade shock. The 'morality of foreigners is irrelevant. It does not require evidence to blame foreigners for the unfairness. In this sense, it is the least ambiguous measure of contingent protection. Aside from this, anti-dumping measures are firm specific. In contrast, safeguard conforms to the principle of non-discrimination. It is non-discriminatory i.e. safeguard shall be applied to a product being imported irrespective of its source. It can not be targeted at imports from a particular country. In the case of safeguard measures thus government acts against other countries. It is therefore clear that SG measures have greater political visibility than the anti dumping. Besides, a member proposing to apply/extend safeguard measure is expected to provide adequate opportunity for prior consultation with those members having a substantial interest as exporters of the product concerned with a view to review information provided by the member country. However, there are no such provisions for consultation in the case of anti dumping law. Finally, the safeguard agreement provide for differential and preferential treatment of developing countries. Safeguard measure may be taken against a developing country only if it supplies more than three percent of imports of that product. In case these countries supply less than 3 percent individually, they should together account for more than 9 percent of total imports to be subject to the safeguard measures. Furthermore, a developing country has the right to extend the period of application of a safeguard measure for a period upto two years beyond the maximum period. Finally, notwithstanding the provisions of the paragraph 5 of Article 7, a developing country may apply SG measures again to the import of a product which has been subject to such a measure , provided that the period of non-application is at least two years. No such preferential treatment is provided to developing countries in the anti-dumping law. Article 15 of the law recognises that special regard must be given by developed countries to developing countries but it is not effective. For these reasons anti-dumping is a unique combination of WTO consistency and ease of

use and safeguard measures are no competitors to anti dumping. And this is perhaps the reason why anti-dumping measures are frequently used as trade protectionist measures.

Second, our findings suggest that once the WTO is fully enforced, the use of anti-dumping will spread among developing countries not only due to greater liberalisation pressures but also due to the fact that more and more countries would like to create anti-dumping ability to counter the anti-dumping use against them. This may have chain effect on the use of anti-dumping and may reverse the trade gains that liberalisation may ensure to developing countries. It is therefore important to restrain the use of anti-dumping against developing countries. WTO records show that around 63% of the cases initiated during 1995-2000 were directed against the developing countries. An analysis of the number of anti-dumping duties, currently in force in the US and the EU against developed and developing countries, yields startling revelations. In the US, two-thirds of the anti-dumping duties are imposed against the developing countries while in the EU around 90% of all impositions are against these countries. OECD countries should therefore take lead in restricting the use of anti-dumping against developing countries. This paper thus calls for granting special and differential (S&D) treatment to developing countries in this provision. By restraining the anti-dumping use against developing countries, developed countries will help in controlling the further spread in anti-dumping use. And this will benefit the developed and the developing countries, both.

Third implication that may be drawn is that anti-dumping has no real antitrust analogue. It is a protection measure and is affected by the same set of factors that determine the use of safeguard measures. If both safeguard and anti-dumping measures aim at providing protection to domestic firms, then there is no rationale for having two different mechanisms dealing with the same situation. In fact, much of the contingent protection that is handled under anti-dumping law could have been dealt with under safeguard measures. SG measures are not popular because they are less attractive. They are subject to more stringent conditions in terms of prerequisites and compensation than anti-dumping (Roitinger 2002). The use of safeguard comes along with compensation because these are applied under the recognition that the domestic industry needs to undergo adjustments. Anti-dumping requires no compensation since it is allegedly based on unfair trade. Moreover, prerequisite for initiating SG measures are higher in comparison with

AD. SG are applied if imports enter the country in such increased quantities, absolute or relative as to cause/threaten serious injury to the domestic industry. Anti-dumping is restricted to dumping that causes/ threaten material injury. Furthermore, safeguard measures are non discriminatory while anti-dumping is firm and country specific. Finally, the investigation process of anti-dumping itself tends to hamper exports. However, economists, while assessing the costs and benefits of contingent protection measures argue that safeguard measures are superior to Anti-dumping. They suggest that an open trading system can best be maintained when the protection costs arising from the use of such measures are kept within national boundaries (Tavares 1995) and safeguard measures offer countries this possibility of keeping protection costs within national boundaries. Besides, safeguards are more transparent, less belligerent and more focussed than anti-dumping. Therefore, one may argue that future negotiations should therefore be directed at revising SG rules and replacing anti-dumping by this new clause. *However*, the decision of the Ministerial Conference of the WTO at Doha emphasises the preservation of the basic concepts, principles and effectiveness of this agreement, its instruments and its objectives. This study nevertheless argues that further fine-tuning and refining of the anti-dumping policy is not the answer to prevent its (mis)use. Anti-dumping law is fundamentally flawed and it is difficult to define general policy guidelines that would make anti-dumping more rational within the existing framework.

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Appendix

Table A1: List of variables

Variable	Description
TARIFF	Average Tariff rate
IMGRTH	Growth rate of imports in period t-1
IVAGR	Growth rate of Industrial value addition in period t-1
AFF	No. of cases initiated against a country in period t-1
TRBAL	Difference in exports and imports in period t-1

Table A2: List of countries included in the analysis

<i>Low and Middle income countries</i>
Armenia Azerbaijan, Bangladesh, China, P.R., Côte d'Ivoire, Honduras, India, Indonesia, Kenya, Kyrgyz Rep., Malawi, Moldova, Mozambique, Nicaragua, Pakistan, Tajikistan, Turkmenistan, Vietnam, Zimbabwe, Algeria, Belarus, Bolivia, Bosnia Herzegovina, Bulgaria, Colombia, Costa Rica, Cuba, Ecuador, Egypt, El Salvador,

Georgia, Guatemala, Iran, Kazakstan, Latvia, Lithuania, Macedonia, Montenegro, Papua New Guinea, Paraguay, Peru, Philippines, Romania, Russia, Serbia, South Africa Sri Lanka, Thailand, Tunisia, Ukraine, Uzbekistan, Yugoslavia.
<i>Upper income</i> Argentina, Bahrain, Brazil, Chile, Croatia, Czech Republic, Czechoslovakia, Estonia, Hungary, Korea, Rep. Of, Libya, Malaysia, Mexico, Poland, Saudi Arabia, Slovak Republic, Trinidad and Tobago, Turkey Uruguay, Venezuela.
<i>OECD</i> Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands Portugal, Spain, Sweden, United Kingdom, European Community, Turkey, Uruguay, Venezuela.
<i>Non OECD Developed</i> Chinese Taipei, Cyprus, Hong Kong, Israel, Liechtenstein, Macao, Qatar, Singapore, Slovenia, United Arab Emirates.

Table A3: List of Sectors

Sectors	
Resource Intensive	Live Animals, Animal Products, vegetable products, Animal or Vegetable Fats & Oils, Tobacco & Mfd. Tobacco Products, Mineral Products, Raw hides & skins, Wood & Articles of Wood, Articles of stone, plaster, cement or similar, Base Metals & Articles of Base Materials
Labour intensive	Textile Articles Footwear, Headgear & the like, Miscellaneous Mfd. Articles
Science based	
Differentiated	Machinery & Mechanical Appliances, Vehicles, Aircraft & associated Transport
Scale intensive	Products Of Chemical or Allied Industries Plastics & Articles, Rubber & Articles Optical, Photographic & accessories thereof
Miscellaneous	Arms and ammunition, Works of art, collectors' pieces & antiques

Table A4 : Correlation Matrices

LOW AND MIDDLE INCOME COUNTRY_GROUPS					
	TARIFF	IMGRTH	IVAGR	AFF	TRBAL
TARIFF	1				
IMGRTH	0.0671	1			
IVAGR	0.1768	0.3615	1		
AFF	-0.1495	0.0713	0.1688	1	
TRBAL	-0.1369	-0.1257	0.0476	0.1767	1
UPPER INCOME GROUP					
TARIFF	1				
IMGRTH	-0.054	1			
IVAGR	0.2289	0.4491	1		
AFF	-0.0889	-0.0102	0.1698	1	
TRBAL	0.2207	-0.2777	-0.2406	0.1033	1
OECD					
TARIFF	1				
IMGRTH	0.0297	1			
IVAGR	0.0837	0.4962	1		
AFF	-0.0044	-0.1182	0	1	
TRBAL	-0.1318	-0.0648	0.1144	0.1992	1