

Does Antidumping Use Contribute to Trade Liberalization in Developing Countries?*

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Abstract

Some supporters of antidumping have argued that this procedure serves as a kind of “safety valve” for protectionist pressure. This paper examines whether there is any empirical evidence that the use of antidumping actions has contributed to tariff reductions in a sample of 23 developing countries, some of which have become aggressive users of antidumping in recent years. The evidence is not supportive of the safety valve argument for these countries. Instead, evidence suggests that past use of antidumping may have led to less trade liberalization.

Keywords: Antidumping, Trade Liberalization, Commercial Policy

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Introduction

Developing countries have experienced a remarkable increase in the use of antidumping duties in recent years. This represents a sharp divergence from the past where antidumping actions were undertaken by a handful of developed countries. Not surprisingly, most economic research on antidumping (AD) traditionally has been focused on developed countries so that the implications of AD use by developing countries is only vaguely understood.

This paper adds to a nascent strand of literature that focuses specifically on developing country use of AD. The specific question is whether there is any evidence that antidumping has been used as a kind of “safety valve” for protectionist pressures that has allowed developing country governments to raise barriers on a small number of products even as they have become generally more open to the international trade flows. For example, Miranda et al. (1998) argue that the introduction of antidumping may have helped liberalization efforts in some countries by requiring governments to adhere to a rules-based import relief system rather than more arbitrary methods. Finger and Nogués (2005) have recently documented instances in Latin America where antidumping may have played such a role. If this safety valve argument is borne out by analyzing data in a broad set of developing countries, the rise of antidumping in developing countries may be less troubling than it at first appears. If the evidence is lacking, then its greater use should be of concern for those who believe that a liberal trade regime is important for developing countries’ economic welfare.

Antidumping actions have long been a part of the multilateral trading system. The World Trade Organization (WTO), and the General Agreement on Trade and Tariffs,

before it, allows these duties if importing countries' governments determine that foreign firms price below production cost or home market price and that the imports cause injury to a domestic industry. These duties are typically placed on a narrow range of products that are subject to an investigation and affect only the specific firms and countries in the case. Consequently, these discriminatory duties are not reflected in the overall most-favored-nation tariff rates applied by a country.

Up until recently, the use of this procedure has been heavily concentrated in the United States, the European Union, Canada, Australia and New Zealand (i.e., the so-called traditional users). Economists, by and large, have argued that these rules are distortionary practices that cause more economic harm than good since antidumping duties are essentially just tariffs. This view typically leads economists to argue that countries should avoid imposing antidumping measures because of the resulting direct economic inefficiencies. Mankiw and Swagel (2005) go even further by arguing that United States should unilaterally repeal its antidumping law.

A number of analysts have noted that developing countries have begun to use antidumping measures extensively in recent years. Figure 1 demonstrates the explosion of use of antidumping in developing countries. We see that developing countries essentially did not use antidumping until the mid-1980s. In the early 1990s, this pattern dramatically changed so much that developing countries have initiated more antidumping investigations on an annual basis than the traditional developed country users. More generally, whereas traditional users' initiations have fluctuated within a band between 75 and 160 investigations per year since 1992, developing country usage has risen steadily in this same period and reached about 220 in 2002 alone.

Zanardi (2006) has shown that Argentina, Brazil, India, South Africa and Turkey are among the most frequent worldwide users of antidumping with annual caseloads in the same order of magnitude, and sometimes higher, as the European Union and the United States.¹ Even more troubling is that the increased use of antidumping by developing countries has a disproportionate impact on other low income countries. In particular, data collected for this study shows that developing countries target other developing countries in about 60% of their antidumping cases.

The increasing use of AD alone might suggest rising protectionism in these developing countries but in fact many of them have undertaken important trade liberalization reforms in their economies as a whole, even as they have imposed antidumping measures on specific products. Some authors have suggested that the correlation of lowered overall tariff levels and antidumping use may be no coincidence. Destler (1996) has pointed to a potential benefit of antidumping. He argues that antidumping rules are a useful “safety valve” by which protectionist pressure can be reduced on a narrow range of products even as governments reduce trade barriers across the economy as a whole. Moore and Suranovic (1992 and 1994) consider how the existence of antidumping measures can lead protection-seeking firms to choose less distortive means of obtaining import restrictions. As noted above, Finger and Nogués (2005) provide evidence consistent with the safety valve argument in interviews and case studies of Latin American official. They find that broad trade liberalization was advanced by carefully managing antidumping procedures.

This study represents the first attempt to evaluate empirically this safety valve

¹ If measured in terms of intensity (i.e., initiations per value of imports) these countries make much more intensive use of antidumping compared to the EU and the U.S.

argument for antidumping. If such a relationship could be demonstrated, then economists' almost universally critical views of antidumping may need to be adjusted to account for one possible "upside" to the use of antidumping. We use a new antidumping data set developed by the authors and supplemented with information from Bown (2005), both of which are based primarily on individual governments' antidumping publications,² to assess whether the number of antidumping initiations or the final imposition of antidumping duties have contributed to trade liberalization in a sample of 23 developing countries for the 1988 to 2004 period. We also control for each country's trade policies, macroeconomic conditions, and legal system quality as well as industry and country unobservables.

Trade liberalization in this paper is based on changes in applied MFN tariffs for each country at the three-digit ISIC level. "Applied" tariffs are those in place and actually affecting trade flows, rather than those agreed upon at multilateral trade negotiations (i.e., "bound" rate). Changes in applied tariffs represent the clearest and most easily interpreted modifications in trade policy in a given country.³

The econometric results suggest that there is no evidence that past antidumping actions are positively correlated with later reductions in tariff barriers in this sample of developing countries. In fact, the evidence suggests just the opposite so that past antidumping use has hindered rather than helped trade liberalization. The point estimates indicate that, for the sample as a whole, one additional antidumping measure will lead to an increase in average tariffs by 0.96 percent. This is a relatively small marginal effect but suggests that the "safety valve" argument for antidumping finds no support in our data, at

² Many earlier studies of global antidumping use have relied on statistics compiled by the World Trade Organization. Unfortunately, the government submissions on which these statistics are based are frequently incomplete or inaccurate.

³ The paper does not address other ways in which countries can liberalize such as changes in non-tariff

least for developing nations.

This paper also contributes to the empirical literature on the determinants of trade liberalization in developing countries. Many of the existing studies focus on specific countries' or region's experiences or use a case study approach. Instead, our paper makes use of an extended sample of countries over a relatively long time horizon to try to reach general conclusions.

The remainder of the paper is divided into the following sections. Section I discusses the relevant literature. Section II includes some descriptive statistics about tariff reductions and antidumping use in the countries included in this study. Section III briefly lays out an analytical framework and outlines the econometric strategy. We discuss the empirical results and their economic significance in section IV. Section V includes some final remarks.

I. Literature Review

The economics literature on antidumping encompasses a broad range of theoretical, empirical, and public policy analyses, all of which cannot be reviewed here.⁴ There are major themes, however, present in the literature that are relevant to the present study.

The first involves the spread of antidumping use to a host of new countries during the last twenty years. Miranda et al. (1998) document the rise of new antidumping users from 1987 through 1997 while Zanardi (2006) has provided further evidence for a more recent time period about how antidumping use has spread across the globe. Prusa (2001) provides a more formal econometric analysis of the implications of the spread of antidumping to new

barriers.

⁴ See Blonigen and Prusa (2003) and Nelson (2006) for broad surveys of the literature.

users. He finds that the use of antidumping has led to large decreases in imports of affected products. Bown (2006) uses a newly-developed data set to analyze the determinants of industry initiations of antidumping petitions in a sample of nine developing countries in the 1995-2003 period. He finds that the industries that obtain antidumping protection have features consistent with the theory of endogenous trade policy (e.g., large concentrated industries facing substantial import competition with falling import prices use the antidumping process). Niels and ten Kate (2004) and Niels and Francois (2006) examine the Mexican experience with antidumping in detail. Their analysis suggests that Mexico's use of antidumping is very similar to the experience of traditional users in its protectionist use and effects. They also find that macroeconomic factors (e.g., business cycle and current account conditions) are important determinants of Mexican antidumping initiations in a way that mirrors traditional users' experience.

Another strand of the literature looks at the impact of antidumping on the domestic economy. Gallaway et al. (1998), for example, estimate that U.S. antidumping duties have reduced economic welfare in the U.S. by US\$ 4 billion a year. Vandenbussche and Zanardi (2006) provide recent evidence on how the antidumping system has reduced aggregate trade among traditional and new users. In particular, they find that imports into traditional users are depressed because of the reputation that these users have built over time and because of current antidumping actions. While a reputation effect does not seem to have emerged yet for new users, their antidumping actions have significant trade depressing effects leading to a reduction of annual imports in some new "tough" users, on average, of around 6.7%.

Recent work has also focused on how the use of antidumping by one country can

affect retaliation by another. The argument is that the presence of antidumping may have provided an incentive for retaliatory restrictions by targeted countries. Feinberg and Reynolds (2006) and Prusa and Skeath (2002 and 2004) find evidence that retaliation is a major determinant in explaining the recent explosion of antidumping cases. For the United States, Blonigen and Bown (2003) find that firms' decision to file a case against a particular country depends on that country's power to possibly retaliate through the GATT/WTO dispute settlement mechanism.

Feinberg and Reynolds (forthcoming) look at an issue related to the one discussed in this paper. They investigate whether there is any evidence that trade liberalization leads to more use of antidumping as domestic firms react to the resulting increased competition – and it seems that antidumping use increased for those countries engaging in larger tariff concessions at the Uruguay Round.

Another important strand of the economics literature relevant for this study is the determinants of trade liberalization. While there is a vast literature on factors that affect the provision of *protection*, there is little work on empirical studies of what factors help explain *trade liberalization* in various countries. Work on the political economy of protection typically focuses on what factors help explain the level of protection as a result of lobbying (e.g., Grossman and Helpman (1994) and Goldberg and Maggi (1999)) or the determinants of specific protectionist trade outcomes (e.g., Moore (1992), Hansen and Prusa (1997), Baldwin (1981)). But the current study is focusing, not on what factors are important in raising new import restrictions but instead what explains trade liberalization.

As for the few studies trying to explain trade liberalization in developing countries, Liu (2002) considers the determinants of Taiwan's trade liberalization efforts from 1986

through 1995. The author finds among other things that traditionally protected sectors were subject to slower liberalization. The advantage of a case study approach is the availability of country-specific data, against the backdrop of lack of generality. Ancharaz (2003) examines the factors that help explain trade policy reform in sub-Saharan Africa. The author looks at, among other factors, macroeconomic variables like the current account, real GDP growth, and inflation and how they help explain trade reforms. La Ferrara (1996) investigates the decision to conduct trade reforms but not their intensity and finds evidence that economic crises and support from multilateral agencies are important determinants for a sample of sub-Saharan countries.

II. Descriptive Statistics

This study will examine the relationship between trade liberalization and the use of antidumping in 23 developing countries for the period 1988-2004. Table 1 provides some basic information about the countries in the data set. These particular countries were chosen because there is available data on sectoral tariff rates and other variables for the relevant period from the World Bank that will form the basis of the dependent variable for the empirical work.⁵ We see in Table 1 that this was a period of substantial tariff reductions for these nations; the average (applied) tariff rate fell by half from 27.4 percent to just over 14.6 percent. It is important to note that these figures are simple unweighted averages across sectors; changing trade shares will not affect the measured tariff rates. Also note that the averages across countries in Table 1 are not strictly comparable since they

⁵ Our empirical specifications will always include industry-country fixed effects. For this reason, only countries with enough annual observations to construct at least two observations for trade liberalization can be included in the analysis. This constraint explains why countries like South Korea and Taiwan are not part of the dataset.

involve different time periods.

Column 3 of Table 1 includes the total number of antidumping investigations launched in each country for the entire period. India has been the most frequent user of antidumping in the sample. At this point, it is important to note that import-competing firms or their workers typically request the institution of an antidumping investigation (though governments can sometimes refuse to begin the process). Thus, the number of initiations is a measure of the access that domestic industries have to the antidumping process. Column 4 of Table 1 displays the number of antidumping measures that were imposed. These outcomes represent the instances where the government decided to act to reduce imports in an antidumping case.

A measure of domestic firms' success in the antidumping process can be roughly approximated as the ratio of measures to investigations. From the last column in Table 1 we see that about one half of antidumping investigations result in duties. We see that India reduced its average tariffs by 49 percent (from 62.18 to 31.48 percent) while approving just over 66 percent of antidumping petitions. Malaysia also approved a higher than average percentage of antidumping petitions (64.7 percent) while dropping average tariffs by 37 percent. These figures suggest at least the possibility that antidumping might have had some role to play in tariff reduction. However, some of the countries that liberalized the most, including Indonesia (average tariff reduction of 58 percent), China (68 percent), and Brazil (68 percent) had relatively small numbers of imposed duties as a percentage of initiated cases (37.5 percent, 25.8 percent, and 45.3 percent, respectively).

The tariff rates used in this study are applied (i.e., statutory) rather than bound (i.e., those agreed upon at multilateral trade negotiations) rates. For developing countries, there

is a substantial “overhang,” (i.e., the bound tariffs are much higher than applied tariffs) so that there is significant discretion available to governments that want to change their trade policy without violating international commitments. Using the latter is thus an appropriate measure of the way in which developing country governments react to a changing economic and political environment.⁶

In this paper, trade liberalization is defined by changes in tariffs at the three-digit ISIC level (revision 2). The change is calculated from a base year and five years into the future. We believe that five years is a time frame that would allow for most tariff changes to be phased in following a change in trade policy. For a particular country, these variables are included only for non-overlapping periods. For example, if tariff data is available from 1990 through 2000, one observation would be for the 1990-1995 period and the second would be for 1995-2000.

The particular form of the dependent variable follows Finger et al. (1996). We start with the relationship between domestic prices (P), international prices (P^*) and ad valorem tariffs ($I+t$):

$$P = P^* (I + t) \tag{1}$$

Totally differentiating and rearranging, we have:

$$\hat{P} - \hat{P}^* = \frac{dt}{(1+t)} \tag{2}$$

where $\hat{}$ denotes percentage change and dt is the change in the ad valorem tariff. For a

⁶ Developed countries tariffs have a much lower tariff overhang. Francois and Martin (2003) report post Uruguay Round average binding overhangs (i.e., the gap between bound and applied rates) of only 0.4, 0.1 and 0.2 percentage points in the EU, Japan and the U.S., respectively. This means that these countries’ tariffs cannot be analyzed using the same methodology we use here since there is much less governmental discretion for random five year periods.

small country (i.e., $\hat{P}^* = 0$), $\frac{dt}{(1+t)}$ measures the percentage by which the domestic price will adjust as a result of a tariff change.

An alternative would be to use the simple percentage change in tariffs (dt/t). The disadvantage with that formulation is that a change of tariffs from 100 to 50 percent yields the same value as a change from 2 to 1 percent, i.e., 0.50. The formulation in (2) treats these two differently (0.495 for the former and 0.333 for the latter) and thereby gives less weight to changes that occur from already low tariff rates.

We will use the right hand side of (2) in our regressions. This can be interpreted as the change in domestic prices as a consequence of the change in trade restrictions.

Specifically, we will use the following in the regressions:

$$\Delta t_{k,i,t} = - \left[\frac{t_{k,i,t} - t_{k,i,t-5}}{(100 + t_{k,i,t-5})} \right] \times 100 \quad (3)$$

where $t_{k,i,t}$ is the simple average of applied tariff rates in country k , sector i and year t .⁷

Thus, we define a reduction in tariffs in a sector as a positive number.

Table 2 reports average trade liberalization (using equation (3)) for the 29 industrial sectors used in the analysis. It also includes antidumping initiations and measures for these sectors. On average, our trade liberalization measure equals 3.94 but with some variation at the sectoral level. For example, the furniture (non-metal) sector liberalized the most (6.43) but the sector was not involved in any antidumping proceeding. The steel and chemical sectors, both of which are heavy users of antidumping in traditional users, have similar patterns among the countries in our sample. They represent 19.4% and 32.6%, respectively, of total initiations (and very similar shares of measures); these sectors had

below average tariff liberalization (1.82 and 2.79, respectively).

III. Analytical and Econometric Approach

We imagine that there are a number of factors that determine the degree to which tariffs are reduced in any particular country and industry. On the one hand, initial macroeconomic conditions can constrain or enhance the ability of a government to undertake any policy reform, including changes in import restrictions. The level of economic development may be correlated with a safety net for those who might bear adjustment costs associated with trade reform. We also expect that the quality of legal institutions in the country might affect the ability of a country to implement the often very complex procedures associated with antidumping. Most importantly, we want to assess whether access to antidumping can act as a safety valve for protectionist pressure that could help smooth the path to more liberalization in subsequent periods.

We start by providing a sketch of how the use of antidumping might affect the level of tariff reductions in a country. Suppose that two separate tariffs levels can be in effect for industry i in a particular country. T_{2i} is the tariff level if no liberalization occurs. The other is T_{1i} ($<T_{2i}$), which is the tariff level for industry i that holds if tariffs are lowered.

We associate positive probabilities to both outcomes, where μ is the probability that liberalization occur, i.e., that T_{1i} is realized, and where $(1-\mu)$ is the probability that no liberalization occurs i.e., that T_{2i} is observed. We therefore can write expected tariffs as:

$$E(T_i) = (\mu)T_{1i} + (1-\mu)T_{2i} \quad (4)$$

⁷ In the numerator we use 100 because an ad valorem tariff rate of 0.05 is reported as 5.0 in our data.

The specific tariff liberalization undertaken is part of a complex game involving domestic agents and international negotiations. We do not model this game explicitly. Instead, we focus on the *marginal* impact of the past use of antidumping on expected tariff levels.

Suppose that this economy has an antidumping process in place that domestic import-competing industries can use in the period prior to the trade reform. Let $\mu^{AD} = f(AD \text{ cases})$ be the probability of observing T_{1i} , which is an increasing function of the number of AD cases (i.e., initiations or measures imposed). For simplicity, we suppose that the AD system can affect the probability of observing a given level of trade liberalization but does not change the level of tariff change in the event of liberalization. We therefore can write expected tariffs in the presence of AD use as:

$$E(T_i^{AD}) = (\mu^{AD})T_{1i} + (1 - \mu^{AD})T_{2i} \quad (5)$$

Consider the difference between expected tariffs in the two tracks:

$$\Delta E(T_i) = (\mu^{AD})T_{1i} + (1 - \mu^{AD})T_{2i} - [(\mu)T_{1i} + (1 - \mu)T_{2i}] \quad (6)$$

If the presence of AD makes no difference in the probability of observing a reduction in tariffs (i.e., $\mu^{AD} = \mu$), expression (6) will be zero. On the other hand, if AD does affect the probability of witnessing trade liberalization in a way that differs from the system without AD in place, (6) can be written as:

$$\Delta E(T_i) = (\mu^{AD} - \mu) \times (T_{1i} - T_{2i}) \quad (7)$$

The sign of (4) depends on the relative size of μ and μ^{AD} since $T_{1i} < T_{2i}$. If AD contributes to a higher probability of trade liberalization (i.e., $\mu^{AD} > \mu$) then we would expect more trade liberalization the more that AD has been used in the past. We expect the function $f(\cdot)$ to be increasing but we will let the data determine if it is linear or not.

We estimate a reduced form equation that will allow for various types of influences

on the degree of tariff reduction. Note that since we have defined trade liberalization in (3) as a *positive* number, in the empirical analysis we will expect a positive correlation if AD leads to greater reductions in tariffs. We assume that the change in tariffs for industry sector i in country k in period t ($\Delta t_{k,i,t}$) can be written as:

$$\Delta t_{k,i,t} = \delta AD_{k,i,t-5} + \alpha X_{k,t-5} + \beta Z_{i,t-5} + \mu_{k,i} + \varepsilon_{k,i,t} \quad (8)$$

where $AD_{k,i,t-5}$ is a measure of antidumping activities five years previously (t-5) and $X_{k,t-5}$ and $Z_{i,t-5}$ are matrices of country and industry variables, respectively in that same earlier period. The values δ , α and β are coefficients (to be estimated) for these explanatory variables. We expect that there may be unobserved industry-country effects that are time invariant, which is represented by $\mu_{k,i}$. We will control for these through the use of combined industry-country fixed effects. A disturbance term is also included ($\varepsilon_{k,i,t}$).

Figure 2 shows the timing of the dependent and explanatory variables. The dependent variable is calculated for the period t-5 through t. Contemporaneous explanatory variables could cause problems since the level of tariff liberalization could be correlated with same period macro- and industry-level conditions. We therefore use lagged explanatory variables to control for endogeneity problems; their values will be known in the base year used to calculate the tariff reduction. For example, tariff reductions (contemporary and past) may affect contemporary and future macroeconomic conditions but future tariff reductions will not affect past economic conditions. The continuous explanatory variables are typically three-year averages of the variables calculated for the years t-5, t-6, and t-7.

We have developed alternative versions of two separate measures of antidumping activity. The first is the total number of antidumping investigations initiated (AD

INITIATIONS) for years t-5, t-6, and t-7 for the country in question. We interpret a positive coefficient as evidence that industries are more likely to accept trade liberalization in the subsequent five years if there has been easy access to an antidumping process as measured by the ability to file antidumping petitions. A second version considers the total number of antidumping measures (i.e., duties, minimum price arrangements, and price undertakings) imposed for those same three years (AD MEASURES).⁸ A large number for this variable means that agents in the economy can see that the antidumping process actually results in import restrictions.

Two alternative versions of these antidumping control variables are created. The first is the country level counts of antidumping activity. We imagine that an industry might acquiesce to trade liberalization in its own sector if it sees that other industries have been able to access the antidumping process. These versions will control for the effects of country-wide use of antidumping. We also control for the use of antidumping in the sector itself. This is to control for the possibility that an industry cares mostly about its own experience with antidumping and is less concerned about overall country-wide use.

The candidates for $X_{k,t-5}$ include variables that describe the macroeconomic condition in the “base period” (the average of years t-5, t-6, and t-7) that do not vary across industrial sectors. The sources for these and other variables are included in Table 3. In this regard, some of our regressors are similar to Ancharaz (2003) although our empirical analysis is different in nature. He focuses on Sub-Saharan Africa to test whether economic crises enhance the extent of trade reforms. In contrast, our sample is only determined by data availability and its wider coverage encompasses a range of countries and economic

⁸ Note that in many jurisdictions antidumping investigations might take as much as a year to complete so that the number of cases initiated and the number imposed in one year do not necessarily correspond even if all

experiences. Correspondingly, we will see that some of our results mirror his findings while others do not.

The first macroeconomic regressor is real gross domestic product per capita (GDP/CAP), which will control for the level of economic development in a country. Nominal GDP has been deflated using the GDP deflator or consumer price index when the GDP deflator is unavailable. A positive value on this slope coefficient would suggest that the political pressures to resist trade liberalization would fall as the nation's average income increased. Increased incomes may result in a more efficient set of policies that provide a social safety net so that those facing trade adjustment costs would be less likely to fight tariff reductions. A negative value might indicate that poorer countries are more likely to adopt trade liberalization as a means to eliminate economic inefficiency associated with protectionism.

The next macroeconomic variable is the average inflation rate in the base period and in the two previous years defined as the percentage change in the GDP deflator (INFLATION) or in the consumer prices when the GDP deflator is not available. We do not have *a priori* expectations for this variable. One might imagine that countries could use trade liberalization to fight inflation by increasing economic efficiency and lowering import prices. Thus, higher inflation in the base period might be correlated with more trade liberalization, so that the coefficient on INFLATION would be positive. A negative coefficient might suggest that policy makers in countries facing stable macroeconomic conditions (at least as proxied by price changes) might feel confident about reducing trade restrictions.

Another macroeconomic variable is the average of the annual percentage growth in

initiations were to result in antidumping measures.

per capita real GDP for the base period and the two previous years (GROWTH). A positive coefficient might suggest that countries facing recent strong economic performance would be willing to reduce trade barriers in the coming years. A negative value could indicate that policy-makers facing poor economic growth might try to use trade liberalization as an impetus to better economic performance.

We also include the average current account as a percentage of gross domestic product (CA/GDP) for the base period and the two previous years. Once again, the expected sign for this variable is ambiguous. On the one hand, trade politics and mercantilist tendencies normally mean that leaders will find tariff reductions easier when a country has a large current account (adjusted for the size of the economy). However, countries facing large current account deficits are large borrowers on international financial markets. Thus, one might expect to see a negative coefficient for developing countries.

Finally, we also control for non-concessional IMF loans (IMF LOANS). These loans are part of reform packages for countries with balance of payments crises. We expect the dispersal of these funds to be positively correlated with trade liberalization since the IMF generally supports trade reform

Trade liberalization is also potentially affected in a profound way by important industry level effects within each country. Such effects might include employment and wage levels, value-added, profit conditions, and associated lobbying and political strength. Unfortunately, while there are some of these series available for the particular countries from World Bank and other sources, there are many missing data. We have therefore made a decision to control for these unobservable influences through combined industry and

country fixed effects.⁹ As a sensitivity check, we later will include sectoral net imports as a percentage of GDP (NET IMPORTS/GDP) although we will be forced to drop a few countries (including South Africa, which is a heavy user of antidumping).

It will also be important to control for the initial levels of the industry's tariffs in the country. This variable will control for past abilities of the sector to obtain protection from the government. SECTOR_TARIFF is the average sector nominal tariff for the base year (year t-5) for each observation. We also include the square of this variable to allow for nonlinearities. A positive value on SECTOR_TARIFF would suggest that sectors with high barriers are more likely to see the greatest reductions. A negative value would mean that those same sectors can systematically withstand pressures for liberalization. We also control for the overall trade policy orientation of the country by including TRADE POLICY INDEX, an index that has been developed by the Fraser Institute. This index ranges from 1 to 10, where 10 represents the highest degree of freedom to trade internationally.

We also include a measure of the quality of the legal system as a measure of institutional quality especially important for implementing antidumping procedures. This variable, called LEGAL SYSTEM QUALITY INDEX, is also based on the Fraser Institute's work and ranges to 1 to 10, where 10 is the highest quality of legal structure and security of property rights.

The list of regressors does not control for GATT/WTO membership and existence of antidumping laws for a particular country. The reason is that there is little variation in such dummies for the countries and years in our dataset. In fact, countries belong to the

⁹ Bown (2006) used similar variables in his study of determinants of antidumping actions in developing countries. However, his research focused on a smaller set of developing countries and a shorter time frame.

GATT/WTO for about 98% of the total observations. Similarly, all countries that have available data for the variables used in this study have an antidumping procedure in place.

IV. Regression Results

We discuss regression results in four separate sections. The first will analyze all countries. The second will compare the results for “high use” and “low use” of antidumping among developing countries. The third section will include a discussion of some sensitivity checks on our results. For all specifications, we report robust standard errors. We suppress all fixed effects estimates for brevity. In the last section, we consider the economic significance of antidumping as a determinant of trade liberalization.

IV.A. All Countries

In Table 4, we display the regression output for the combined sample that includes 1,447 total observations for all nations in the sample. Recall that the dependent variable is the sectoral change in MFN tariffs following Finger et al. as defined in (3) above.

In column 1, we use all variables except for the antidumping controls. In this specification, all controls are significantly different from zero at least at a 5 percent marginal level, except for IMF LOANS.

The first set of variables control for national and sectoral trade policies. The coefficient on TRADE POLICY INDEX is positive and significant, which is consistent with a world in which countries with “good” overall trade policies will undertake further liberalization in the future. At the sectoral level, we see evidence that industries with higher initial tariffs tend to liberalize more (since SECTOR TARIFF is positive) but that

this relationship falls with higher-and-higher tariff levels (SECTOR TARIFF SQUARED is negative).¹⁰ This suggests that a non-linearity such that sectors with very high average tariff levels may be able to resist pressures to liberalize.

The second set of variables is designed to control for country-wide macroeconomic conditions. The positive coefficient estimate for lagged per capita income (GDP/CAP) suggests that countries starting at higher levels of economic development tend to liberalize more. We see evidence that higher INFLATION is correlated with less trade liberalization; for the sample as a whole, trade liberalization is not being used as an anti-inflationary policy tool. The coefficient on GROWTH is negative and significant. The results for CA/GDP suggest that a higher (lower) current account surplus (deficit) may lead to greater subsequent reductions in tariffs. In short, we find evidence that countries with more economic stability, as proxied by lower inflation rates, higher per capita incomes and less international borrowing, tend to undertake more trade liberalization. Nations with lower economic growth rates in a previous period may be using trade liberalization as a means to improve future economic vitality. As a comparison, Ancharaz (2003) finds that INFLATION, CA/GDP and aid exert a positive and significant effect on trade liberalization in a sample of sub-Saharan countries while GROWTH, although negative, is insignificant.

Finally, we see that the coefficient estimate for LEGAL SYSTEM QUALITY, which we include to control for rule of law and property right protections, is positive and significantly different from zero. This suggests that, even after controlling for macroeconomic conditions, countries with overall high quality of legal institutions will tend to liberalize more.

¹⁰ There may be some concern about a potential bias in the estimates since SECTOR-TARIFF and SECTOR-TARIFF-SQUARED are lagged functions of the dependent variable and we are using fixed effects. We ran

We now turn to the key questions in this research –the possible role of antidumping in the liberalization process. As noted above, two different versions are used, one of which is the number of antidumping initiations and the second is count of final duties imposed. Recall that typically domestic firms rather than governments initiate antidumping petitions so that this number reflects requests from import-competing firms for protection. The final imposition of antidumping measures reflects instead the decisions of governments to grant protection. These two measures will therefore let us explore whether it is industry access to an antidumping process or realized protection under the system that might be important to tariff reduction. These two measures of course are highly correlated (approximately 75 percent) so they cannot be use simultaneously in any of the regressions.

Columns 2 and 3 of Table 4 include the results when the country-wide three-year (t-5, t-6, and t-7) totals of antidumping initiations and measures are included, respectively. We see evidence that both measure of antidumping usage are negatively correlated with trade liberalization. In other words, there is no evidence in these regressions that antidumping use has helped governments lower future tariff rates for the sample as a whole.¹¹ The coefficient estimates for other explanatory variables in columns 2 and 3 are qualitatively identical to those in column 1.

The results for sectoral level use of antidumping are included in columns 4 and 5. As we saw with country-wide AD use, there is evidence in column 4 that sectoral initiations have had a deleterious impact on later tariff reductions in those same industries. It is important to remember that antidumping duties are not included in the calculation of sectoral MFN tariffs so that an increase in AD duties is not reflected in our dependent

the regressions without these two explanatory variables and obtained qualitatively similar results.

variable. Similar results hold in column 5 for sectoral AD measures.¹²

Columns 6 and 7 include both country and sectoral measures of antidumping use in the same regressions.¹³ These results suggest that country-wide totals of antidumping usage have more effect on trade liberalization outcomes than the sectoral measures. In column 6, the coefficient for country-wide AD initiations are estimated more precisely than the sectoral counterparts. In addition, the point estimate for the former is 40 percent larger than the latter. This pattern is even more striking in column 7 where the marginal significance for the sectoral measure variable is 32 percent and the point estimate is half the size of the country-wide variable. Taken together, these results are consistent with an interpretation that access to antidumping in the country as a whole has more negative effects on industry-level trade liberalization than its use in specific sectors. In addition, the coefficient estimates suggest that antidumping measures imposed have more of a negative impact on trade liberalization than the initiation of investigations. This may reflect that the ability of industries to win final imposition of an antidumping duty could mean that they are also able to withstand broader liberalization.

IV. B. High AD vs. Low AD Use Developing Countries

There are important differences in antidumping use among the developing countries in the sample. Table 1 showed that nations in the developing country sample include countries that rarely have used antidumping (e.g. Chile) as well as some that have become frequent

¹¹ In regressions not reported here, we used antidumping counts for year t-5 alone and for five year totals for years t-5 through t-9; the results mirror those in Table 4.

¹² Identical signs and similar marginal statistical significance resulted when we ran the same regressions for the one year and five year total sectoral AD usage.

¹³ There might be some concern about high correlations between these two measures. In fact, the country- and sectoral-level initiation variables have a correlation of only 29% compared to 27% for the measures variable.

users of the procedure (e.g. India). We have consequently split the developing country sample into those that are “high” and “low” users of antidumping. “High” AD users are countries in which the total initiations are greater than the sample mean of AD initiations among developing countries. The frequent users include: Argentina, Brazil, China, India, Mexico, Peru, South Africa, and Turkey. The total number of observations for this sample is 493. The “low” users include the balance of the developing country sample and involves 954 individual changes in sectoral tariffs.

Table 5 shows that both sets of countries have a negative correlation between antidumping use and trade liberalization. All of the coefficient estimates for the antidumping variables are negative in both samples. In all specifications, the country-wide measures of antidumping (both initiations and final measures) are significantly different from zero at a 1 percent level. The point estimate for the low users’ AD use tends to be higher than for those countries that use antidumping more intensively. For example, the coefficient estimate for AD MEASURES (country) for low users (-2.133) is many times larger than for high users (-0.079). This might reflect a diminishing marginal negative effect on trade liberalization as antidumping use becomes more common.

Many of the explanatory variables have the same signs and similar marginal significance levels across subsamples (e.g., SECTOR_TARIFF, GDP/CAP and LEGAL SYSTEM QUALITY). However, there are some important differences. We see that GROWTH has little explanatory power for high-AD use countries but its coefficient is negative and significant at a 1 percent level for the low-use AD nations. Similarly, INFLATION is significant for the latter and not the former. Finally, we see that IMF LOANS helps explain trade liberalization for the low-AD use countries, even though the

average inflation rate is much lower than the other group of countries.

IV. C. Sensitivity Analysis

We report the results of various sensitivity checks in Table 6. In columns 1 and 2, we include (NET IMPORTS)/GDP, which is the (lagged three year total) net imports (imports minus exports) of the 3-digit ISIC sector as a percentage of country GDP.¹⁴ The advantage to this variable is that it captures the international exposure to competition of the particular sector. Secondly, unlike the industry-country fixed effects, this variable varies over time. The disadvantage is that its inclusion reduces the number of observations and results in some countries' (most notably South Africa, which is a heavy user of antidumping) absence from the data set.

As expected, the coefficient on (NET IMPORTS)/GDP is negative but it is statistically different from zero at a 10 percent level in only one of the specifications (column 2). Otherwise, the results from previous specifications basically follow through even though the number of observations falls to 1,236 and the number of countries is reduced to 20.

Columns 3 and 4 include results if we estimate columns 6 and 7 of Table 4 but include separate industry- and country-specific fixed effects. Such specifications leave more variance to be explained by the time-varying coefficients. Although the overall fit of the models is lower, as shown by the R^2 , the estimates are qualitatively identical to our earlier results.

As a further sensitivity check, we include the square of antidumping use to see whether there is evidence of non-linearities. One might expect for example that the

marginal effect of an additional antidumping case would have a different effect in moving from 3 to 4 cases than from 20 to 21. The results in columns 5 and 6 show some evidence of non-linearities, although not in a systematic way.¹⁵

In results not reported here, we also used the simple percentage change in tariffs as the dependent variable. Once again, the qualitative results are very similar to those reported in Table 4.

In short, we find strong evidence that the estimates of the determinants of trade liberalization in developing countries are invariant across econometric specifications. Most importantly, we find that past antidumping use is invariably negatively correlated with tariff liberalization.

IV. D. Economic Significance

We have discussed the statistical significance of antidumping use but have not considered the marginal economic impact of the estimated antidumping effects. The form of the dependent variable means that one must be careful in interpreting the coefficient estimates. The reason is that the marginal effect depends on the initial value of the tariff. Consequently, we will examine the estimated economic impact of one more AD case (i.e., initiation or measure) by calculating the implied percentage change in tariffs from the sample mean for the sectoral tariffs. Suppose that the coefficient estimate is -0.143, as for aggregate AD initiations in column (6) of Table 4, and that t_o and t_l are the pre- and post-liberalization tariff rates, respectively (where a 0.10 ad valorem tariff rate is written as 10). Then, we have

¹⁴ We thank Alan Fox for providing this information from WITS.

$$-\left[\frac{t_1 - t_0}{(100 + t_0)}\right] * 100 = -0.143 * AD \text{ INITIATIONS}$$

We can then translate this into a percentage change using the following formula:

$$\left[\frac{t_1 - t_0}{t_0}\right] * 100 = \frac{0.143 * (100 + t_0)}{t_0}$$

Table 7 includes the marginal effects, evaluated at appropriate means of initial tariffs for the different subsamples.

The point estimate of -0.143 for country-wide AD initiations in column 6 of Table 4 suggests that one more antidumping petition would result in a 0.76 percentage increase in sectoral tariffs. For imposed antidumping measures, the coefficient estimate of -0.182 translates into an increase of 0.96 in sectoral tariffs.¹⁶ These calculations suggest that the economic impact of a single additional antidumping action may be relatively small, even if the coefficient estimates are significantly different from zero. However, it is important to remember that many developing countries have experienced a large increase in the number of antidumping cases so that the overall negative affect of antidumping on trade liberalization could be substantial.

Note that the marginal effects on tariff liberalization of an additional AD case differs substantially across the high- and low-AD use countries. An additional investigation would increase the average sectoral tariffs by 6.7 percent for low-users

¹⁵ There is no evidence of non-linearities when using one or five-year versions of aggregate antidumping variables.

¹⁶ The marginal effects when using a simple percentage change for the dependent variable would be 0.50 and 0.96, respectively, for antidumping initiations and measures.

compared to only 0.23 for high-users. However, the different order of magnitude of these marginal effects must be related to the average antidumping caseload of these two samples. As it can be seen in Table 5, high-use countries imposed on average almost 5 measures a year, while low-use countries imposed a measure every three years.

V. Conclusions

This paper is one of the first to try to ascertain the implications of the rapid increase in antidumping use in developing countries. The specific research question is to evaluate econometrically whether past use of antidumping helps explain subsequent trade liberalization in a group of 23 developing countries. This question is prompted by the frequently noted argument among supporters of antidumping that its use can help relieve protectionist pressure.

We control for macroeconomic conditions, initial tariff levels both at the national and sectoral level, and industry-country fixed effects and then consider how both the initiation of new antidumping investigations as well as the imposition of final antidumping duties affect reductions in tariff rates in a subsequent period. The particular form of antidumping activity in the analysis is the number of investigations launched or the number of measures imposed over a three year period prior to tariff changes. We then analyze what factors explain percentage tariff changes in each three-digit ISIC industrial category five years hence.

The initial regression model includes estimates for all countries analyzed together. These regressions indicate that there is evidence that antidumping use is correlated with less trade liberalization. In addition, we see evidence that higher incomes, lower inflation,

weaker economic growth, and better institutions are all correlated with greater reductions in tariffs for the sample as a whole. For the whole sample, we see indications that antidumping use has led to less trade liberalization but that this effect is relatively modest, even if statistically significant.

The results of this study do not support the “safety valve” argument that antidumping, long a part of the multilateral trading system, has contributed to governments’ abilities to lower tariffs. Indeed, antidumping seems to have done just the opposite for the countries in this sample. Seen through this prism, antidumping not only creates distortions through the direct misallocation of resources through increased tariffs, it may also undercut the ability of governments to convince its citizens to accept broader trade liberalization.

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Table 1: Countries List and Summary Statistics

Countries	Average Initial Tariff Level		Average Final Tariff Level		AD Initiations	AD Measures Imposed	AD Success Rate
<i>Argentina</i>	13.64	(1992)	14.71	(2002)	216	122	56.5%
<i>Bangladesh</i>	118.56	(1989)	21.00	(2004)	0	0	--
<i>Bolivia</i>	9.92	(1993)	9.93	(2003)	0	0	--
<i>Brazil</i>	46.03	(1989)	14.51	(2004)	159	72	45.3%
<i>Chile</i>	10.95	(1992)	6.97	(2002)	16	7	43.8%
<i>China</i>	51.35	(1992)	16.21	(2002)	62	16	25.8%
<i>Colombia</i>	7.98	(1991)	13.70	(2001)	41	21	51.2%
<i>Ecuador</i>	11.37	(1993)	13.45	(2003)	4	2	50.0%
<i>Hungary</i>	15.50	(1991)	11.66	(2002)	0	0	--
<i>India</i>	62.18	(1992)	31.48	(2004)	330	218	66.1%
<i>Indonesia</i>	25.71	(1989)	10.87	(2004)	40	15	37.5%
<i>Malaysia</i>	18.09	(1988)	11.35	(2001)	17	11	64.7%
<i>Mexico</i>	14.59	(1991)	21.17	(2001)	214	103	48.1%
<i>Paraguay</i>	20.05	(1991)	13.94	(2001)	2	1	50.0%
<i>Peru</i>	19.06	(1993)	10.85	(2004)	100	44	44.0%
<i>Philippines</i>	32.31	(1988)	5.25	(2003)	28	14	50.0%
<i>South Africa</i>	14.36	(1988)	10.88	(1998)	178	64	36.0%
<i>Thailand</i>	43.03	(1989)	21.29	(2000)	9	6	66.7%
<i>Trinidad Tobago</i>	21.23	(1991)	10.05	(2001)	8	7	87.5%
<i>Tunisia</i>	30.96	(1990)	29.65	(2003)	0	0	--
<i>Turkey</i>	12.24	(1993)	8.18	(2003)	75	38	50.7%
<i>Uruguay</i>	8.38	(1992)	14.16	(2002)	7	4	57.1%
<i>Venezuela</i>	21.48	(1992)	14.03	(2002)	27	16	59.3%
Average	27.35		14.58				52.1%

Notes: the years in parenthesis are for the first and last year included in the regressions; Antidumping initiations and measures are the totals for the period defined by the years in parenthesis (or shorter for countries that adopted an antidumping law sometimes in between).

Table 2: Industry Classification and Summary Statistics

ISIC Classification (revision 2)	Average $\Delta t_{k,i,t}$	AD Investigations		AD Measures Imposed	
311 Food products	1.47	52	(3.39)	19	(2.43)
312 Food products (others)	3.22	19	(1.24)	5	(0.64)
313 Beverages	1.62	2	(0.13)	0	(0.00)
314 Tobacco	5.64	1	(0.07)	0	(0.00)
321 Textiles	5.17	89	(5.81)	49	(6.27)
322 Wearing apparel except footwear	6.39	32	(2.09)	8	(1.02)
323 Leather products	5.50	1	(0.07)	0	(0.00)
324 Footwear except rubber or plastic	5.36	15	(0.98)	11	(1.41)
331 Wood products except furniture	4.81	4	(0.26)	3	(0.38)
332 Furniture except metal	6.43	0	(0.00)	0	(0.00)
341 Paper and products	3.58	67	(4.37)	30	(3.84)
342 Printing and publishing	2.83	0	(0.00)	0	(0.00)
351 Industrial chemicals	2.79	500	(32.62)	255	(32.65)
352 Other chemicals	4.11	37	(2.41)	21	(2.69)
353 Petroleum refineries	2.67	2	(0.13)	0	(0.00)
354 Miscellaneous petroleum and coal products	3.06	2	(0.13)	2	(0.26)
355 Rubber products	3.91	41	(2.67)	19	(2.43)
356 Plastic products	4.96	20	(1.30)	12	(1.54)
361 Pottery china earthenware	4.59	1	(0.07)	1	(0.13)
362 Glass and products	4.06	31	(2.02)	11	(1.41)
369 Other non-metallic mineral products	4.31	24	(1.57)	17	(2.18)
371 Iron and steel	1.82	298	(19.44)	163	(20.87)
372 Non-ferrous metals	2.41	24	(1.57)	6	(0.77)
381 Fabricated metal products	3.76	73	(4.76)	46	(5.89)
382 Machinery except electrical	3.29	47	(3.07)	13	(1.66)
383 Machinery electric	4.49	67	(4.37)	44	(5.63)
384 Transport equipment	2.90	11	(0.72)	9	(1.15)
385 Professional and scientific equipment	3.74	43	(2.80)	15	(1.92)
390 Other manufactured products	5.38	30	(1.96)	22	(2.82)
Overall	3.94				

Notes: $\Delta t_{k,i,t} = - \left[\frac{t_{k,i,t} - t_{k,i,t-5}}{(100 + t_{k,i,t-5})} \right] \times 100$ so that tariff reductions are positive numbers; antidumping initiations and measures are the totals for the periods defined in Table 1; percentages of total cases reported in parenthesis.