

# Welfare Effects of Introducing Antidumping Procedures in a Trade-Liberalizing Country

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## Abstract

*We analyze the national welfare consequences of trade liberalization when accompanied by the introduction of a resource-using antidumping process. The final welfare effect of liberalization depends critically on parameters that define the anti-dumping process, especially the size of the anti-dumping duties, the probability that a petition will be granted and the industry-incurred cost of seeking protection. Using a numerical simulation we generate liberalization scenarios which result in national welfare losses. We use these results to suggest ways to better assure that the reform of trade procedures results in a welfare improvement.*

## I. Introduction

The notable economic success of outward-oriented newly-industrializing countries has prompted many developing countries to abandon import-substitution strategies in favor of export-promotion policies. For example, the governments of Mexico, Colombia, Turkey, and Morocco have begun to dismantle non-tariff barriers such as quantitative restrictions and import licenses and have replaced them with tariffs which in turn are being reduced.

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Even as these countries have begun to lower their overall level of protection, many have also "reformed" their import regimes by instituting "unfair trade" remedies which are consistent with GATT rules. Most prominent among these schemes are antidumping (AD) procedures. Under these GATT-sanctioned procedures, administrative bodies rather than politically-motivated politicians make "objective" determinations about import-pricing policies and, if certain criteria are satisfied, firm- or country-specific retaliatory duties can be placed on certain imports.<sup>1</sup>

Mexico is one such country that has simultaneously reduced imports barriers and introduced new AD procedures. In 1985 over 90% of imports were covered by import licenses, the maximum tariff rate was 100% and the average tariff rate (excluding the effects of quantitative and other non-tariff restrictions) was 28%. By 1989, only 22% of imports were subject to license requirements, the maximum tariff rate fell to 20% and the average tariff rate was 12%.<sup>2</sup> However, shortly before joining the GATT in 1986, Mexico enacted the Foreign Trade Regulatory Act which contained an antidumping law consistent with the GATT Antidumping Code.

Mexico has begun to use AD measures aggressively to protect some of its industries. In 1992 alone, the Mexican government adjudicated 46 cases involving 35 separate imported products.<sup>3</sup> In April 1993 the government imposed antidumping duties of up to 1105% on approximately \$225 million of imported clothes, shoes, textiles and toys from China. In February 1993, the Mexican government imposed countervailing duties of up to 39% on \$116 million of steel exports from six US companies.<sup>4</sup>

Many observers have argued that instituting AD and CVD procedures along with trade liberalization represents a welfare-improving trade reform. Under an AD-based regime the erection of barriers is supposed to be based on "facts" and "objective" criteria and thus more difficult to be manipulated by political considerations. In addition, some authors have argued that significant trade liberalization is more likely if import-compet-

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1. For a comparative study of legal and administrative issues in antidumping regimes, see Jackson and Vermulst [1990].

2. U.S. International Trade Commission [1990].

3. U.S. International Trade Commission [1993].

4. See the Financial Times, London, April 28, 1993.

ing industries are offered a "safety valve" against supposedly unfair trade practices.<sup>5</sup>

Nevertheless, the benefits of lower overall trade barriers in trade-liberalizing countries are reduced to the extent that they are simply replaced by AD duties. One need only look to the experience in the developed world to become nervous about the potential disruption that AD can cause in liberalizing economies. In fact, use of these "unfair trade" remedy laws have become the single most common means of restricting imports into developed economies. The United States alone has adjudicated some 570 antidumping and 300 countervailing duty cases since 1980.<sup>6</sup>

There is yet another disadvantage to introducing AD procedures. By their very nature, dumping allegations must be proved before an administrative panel that requires resources in order to operate.<sup>7</sup> Rebuttal by importers is usually permitted and appeals are also possible. All these efforts divert resources from otherwise productive uses. Consequently, even if an AD petition is unsuccessful and no duty imposed, welfare is reduced because of the protection-seeking activities.

Despite these two classes of welfare-reducing effects of a new AD system, if the original liberalization is "large" enough or if AD procedures are not "too" damaging, a trade liberalization combined with a new AD process may still lead to a welfare improvement. One of the primary goals of this paper is to investigate the conditions under which this increase in welfare may occur.

In particular, we analyze the welfare implications of this type of trade liberalization by constructing a simple general equilibrium model with one import and one export sector. We shall assume that when import tariffs are

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5. Bhagwati [1988, p.35] argues for example that the preservation of a liberal world trading order can be enhanced by "permitting the appropriate use of CVD and AD actions to maintain fair, competitive trade."

6. These raw figures somewhat overstate the frequency of AD cases. For example, a case involving one product from five different countries are counted as five separate cases. In addition, many AD cases are simultaneously filed as CVD petitions.

7. The U.S. International Trade Commission, whose main activities include material injury decisions in AD cases, employed 460 full-time workers and had a budget of \$38 million in 1991.

reduced, a rule-based antidumping procedure is simultaneously introduced. The import industry can apply for additional protection under the AD process, but only if it expends resources to pursue a petition. However, we assume that the industry is successful only with some positive probability. Thus when choosing whether to file, the industry must weigh the certain costs versus the uncertain benefit of additional protection.

The paper is organized in the following way. The basic model is introduced in section II. In section III, we consider some of the theoretical implications for national welfare. In section IV we present the results of simulations that provide additional insight into the issues presented in earlier sections. Concluding remarks as well as possible extensions are included in section V.

## II. The Model

Suppose a competitive market economy produces two goods  $X$  and  $Y$ , where  $X$  is an import-competing industry and  $Y$  is a composite good representing the rest of the economy. Assume further that the country is a price-taker on world markets. There is one mobile productive factor, labor ( $L$ ), and some factor specific to the  $X$  industry ( $K_0$ ). Good  $X$  is produced using a constant-returns-to-scale Cobb-Douglas production function:

$$X = ZK_0^{1-\gamma}L_x^\gamma \quad (1)$$

where  $Z$  is a positive constant,  $K$  is an industry-specific fixed factor and  $\gamma \in (0, 1)$  is the labor share of production costs.<sup>8</sup> Profit in the  $X$  industry represents the return to the specific factor and can be non-zero in equilibrium.

Let the production function for  $Y$  be

$$Y = a_y L_y \quad (2)$$

where  $a_y$  is (constant) average labor productivity in  $Y$  and  $L_y$  is the amount of labor devoted to  $Y$  production. This formulation ensures that the wage is not affected by labor allocation decisions in the  $X$  industry.<sup>9</sup>

8. Moore and Suranovic [1992b] analyze a similar model with general functional forms.

9. This formulation is indicative of an import-competing industry that is "small" with respect to the rest of the economy.

The economy's labor endowment can be used either in production or, after introducing the anti-dumping procedure, in protection-seeking activities. The full employment condition is:

$$L_x + L_y + L_A = \bar{L} \quad (3)$$

where  $L_x$  and  $L_y$  are labor devoted to production of the two outputs,  $L_A$  is labor diverted to the protection-seeking activities and  $\bar{L}$  is the economy's labor endowment.

National welfare is described by a community Cobb-Douglas utility function defined over goods  $X$  and  $Y$ :

$$U = X^\mu Y^{1-\mu} \quad (4)$$

where  $\mu \in (0, 1)$  is the consumption-share of the imported good.

The indirect utility function for this economy depends upon the level of domestic national income,  $I^d$ , and the domestic price,  $P^d$ :

$$V = (\mu I^d / P^d)^\mu ((1-\mu) I^d)^{1-\mu} \quad (5)$$

Domestic income, defined as the sum of the value of outputs of goods  $X$  and  $Y$  evaluated at domestic prices plus tariff revenue collected by the government, can be written as:

$$I^d = (1 / (1 + T(1 - \mu))) (P^d \hat{X} + \hat{Y}(1 + T)) \quad (6)$$

where  $P^d = P(1 + T)$  and where  $\hat{X}$  and  $\hat{Y}$  are the optimal output levels.  $P$  and  $P^d$  are the world and domestic prices, respectively, of good  $X$  in terms of good  $Y$  and  $T$  is the *ad valorem* tariff applied on imports of good  $X$ .

Before liberalization occurs, suppose the country maintains a tariff of  $T_0$  on imports of good  $X$ . With this tariff the domestic price of good  $X$  is,  $P_0^d = P(1 + T_0)$ . Plugging the tariff rate,  $T_0$ , and the domestic price,  $P_0^d$ , into equations (5) and (6) above yields national welfare and domestic income before liberalization occurs. Let  $V_0$  represent this pre-liberalization level of national welfare.

Trade liberalization is assumed to consist of two changes. First, the *ad valorem* tariff is lowered on imports of good  $X$ . Second, an anti-dumping pro-

cedure is introduced which will allow industry  $X$  to apply for a higher tariff if dumping and material injury by the foreign competitors can be proved.

Suppose that liberalization results in a tariff on imports of good  $X$  of  $T_1$  such that  $T_1 < T_0$ . The domestic price becomes  $P_1^d = P(1 + T_1)$ . Plugging the tariff and the domestic price into equations (5) and (6) yields a level of national welfare we will call  $V_1$ . This is the level of national welfare reached if no resources are diverted toward an AD petition. Assuming that the country is a "small" country in international markets guarantees that  $V_1 > V_0$ .<sup>10</sup> The addition of an anti-dumping procedure provides the import-competing industry with an opportunity to raise its tariff above  $T_1$ . Call this source of additional protection Source A.<sup>11</sup> The industry must employ labor resources,  $L_A$ , to receive an anti-dumping duty  $T_A$  from this source. However, the industry does not receive protection with certainty. Instead, it has some subjective probability of receiving protection from Source A, called  $\alpha$ . The value of  $\alpha$  depends on the strength of the industry's AD case, its political clout, the laws concerning lobbying and knowledge about past successes and failures of other industries seeking protection from this source.<sup>12</sup>

Assuming risk-neutrality, industry  $X$  will pursue lobbying only if its expected profits from Source A exceed the profits associated with no lobbying. Denoting the expected level of profits from Source A as  $E_A[\pi]$ , the industry will find Source A profitable if

$$E_A[\pi] = \alpha(\bar{\pi}_A - wL_A) + (1 - \alpha)(\underline{\pi} - wL_A) > \underline{\pi} \quad (7)$$

10. The model could allow the country to be "large" but adjustments would have to be made for tariff changes in the neighborhood of the optimum. For instance, some liberalizations could result in a tariff reduction that actually lowers welfare.

11. We assume that an industry, rather than individual firms, lobby for protection. Although free-rider problems could make a profitable petition less likely, it would not affect the general conclusions reached below. For further discussion of the free-rider problem in protection-seeking, see Baldwin [1982] and Rodrik [1986].

12. An alternative formulation would have  $\alpha$  positively related to  $L_A$ , *i.e.*, more lobbying effort results in a higher probability of receiving protection. We can interpret  $L_A$  as the optimal choice for lobbying effort as long as the level of protection is not affected by the industry's choice of  $L_A$ . Although allowing lobbying to affect the level of protection is relevant and interesting, including this complication will distract from the central issue of adding a new protectionism alternative.

where  $\underline{\pi}$  is industry profit under the liberalized tariff ( $T_1$ ) and  $\bar{\pi}_A$  is industry profit when an anti-dumping duty of  $T_A$  is levied in addition to  $T_1$ . Note that both  $\underline{\pi}$  and  $\bar{\pi}_A$  are defined *exclusive* of AD petitioning costs.

Using (7), we define a "breakeven" probability, called  $\tilde{\alpha}$ , which is the probability of success that leaves the industry indifferent between seeking protection and accepting the lower price,  $P_1^d$ . It can be shown that this breakeven probability equals:

$$\tilde{\alpha} \equiv wL_A / (\bar{\pi}_A - \underline{\pi}) \quad (8)$$

The industry will choose not to pursue protection from Source A for any  $\alpha < \tilde{\alpha}$  but will seek protection for any  $\alpha > \tilde{\alpha}$ . From (8) it is clear that an industry will be less likely to pursue protection as  $L_A$  increases or the anti-dumping duty,  $T_A$ , decreases.<sup>13</sup> However, it can also be shown that the larger the increase in the trade liberalization, the less likely that a petition will be filed. Because profit functions are convex in prices, the smaller is  $T_1$ , the smaller will be the increase in profits associated with the imposition of an AD duty. If  $(\bar{\pi}_A - \underline{\pi})$  is smaller, then  $\tilde{\alpha}$  is larger, making a firm less likely to file for any given probability of AD success.

National welfare when the industry pursues an anti-dumping action, will depend upon whether the petition is granted. If granted, the domestic price rises to  $P_A^d = P(1 + T_1 + T_A)$  and the domestic X industry incurs an unproductive resource cost  $L_A$ . Since the Y industry is assumed to have constant returns to scale while the X industry has decreasing returns due to the fixed factor, the resource cost,  $L_A$ , in the X industry results only in a reduction in the optimal output of good Y.

Define the national welfare level for the outcome when an AD duty is imposed subsequent to a liberalization as  $V_{1A}$ . This level of welfare is determined by plugging the new domestic price (*i.e.*, the AD duty added to the new lower tariff rate) and the new optimal output levels into equations (5) and (6).

We know that  $V_{1A} < V_1$  for two reasons. First, since the tariff is higher with the anti-dumping duty applied, national welfare is lower. Second, since a resource cost is incurred to seek the anti-dumping duties, fewer goods are produced by the economy which also reduces welfare.

13. For details, see Moore and Suranovic [1992a].

The relationship between welfare levels under a successful AD petition ( $V_{1A}$ ) and the pre-liberalization level ( $V_0$ ) is ambiguous. If the original liberalization were small enough so that the AD-inclusive tariff rate exceeded the original tariff, *i.e.*,  $T_A + T_1 > T_0$ , then the post-AD welfare level would indeed be lower, despite the trade reform. Even if  $T_A + T_1 < T_0$ , the resource costs of pursuing protection might outweigh the benefits of the partial trade liberalization. However, there is an ambiguous effect on welfare as  $L_A$  rises. As it increases, the diversion of productive resources clearly increases, implying lower welfare. At the same time, the increase also makes the filing of an AD petition less likely since  $\tilde{\alpha}$  will rise.

If the  $X$  industry seeks an anti-dumping duty but is turned down, then the tariff would remain at  $T_A$  but the resource cost of  $L_A$  would still be incurred. The national welfare level for this outcome is labeled  $V_{1B}$ , and is determined using the liberalized domestic price and the lower output levels in the  $Y$ -sector as labor is withdrawn for use in the antidumping petition effort. We know that  $V_{1B} < V_1$  since, though the tariff remains unchanged, the additional resource cost to file the anti-dumping petition is incurred.

As with the successful AD petition, the relationship between  $V_{1B}$  and  $V_0$  is indeterminate. If the resource cost of filing an AD petition were large enough then  $V_{1B}$  could be less than  $V_0$ , despite the welfare gains of the tariff reduction.

### III. Evaluating Trade Liberalization Effects

The discussion above makes clear that the national welfare effects of tariff reduction combined with the introduction of an anti-dumping procedure will depend upon the following factors: 1) the size of the initial tariff liberalization in the  $X$  industry, 2) the probability that the  $X$  industry can win additional protection with an antidumping petition, 3) the size of the antidumping duty ultimately provided to the  $X$  industry, and 4) the resource cost filing and adjudicating an antidumping petition. Fortunately, a government embarking on a trade liberalization policy of this sort has some control over each of these factors.

The simplest variable to control is the initial tariff reduction. The larger the tariff reduction on imports, the larger will be the welfare gain for a small



trading country. A large liberalization will provide a larger base welfare improvement, even if AD procedures erode some of those gains. The other three variables are affected indirectly by the rules which define the antidumping procedures and by the way in which the rules are administered. For example, the AD legislation will describe how dumping margins are to be calculated, by what criteria injury to the industry should be determined and the amount of information required to file a petition. These rules and the way they are administered will determine whether it is easy or difficult for an industry to demonstrate that dumping and injury has occurred and will affect the amount of information that the industry must provide in its petition. Thus the rules will affect the probability that an industry can win an anti-dumping petition, the size of the dumping margin, and the resource cost to enter the process.

If the antidumping procedures generate an environment in which the expected profitability of filing an AD petition is less than the status quo, then no petition is filed, the AD process remains dormant, and national welfare necessarily rises when trade liberalization occurs.

If, however, the AD procedures generate parameter values such that  $\alpha > \tilde{\alpha}$ , then the  $X$  industry would file an AD petition. The expected level of national welfare can be constructed, *ex ante*, using appropriate probabilities. If we assume that the government and the firm share the same expectation of the probability of success for an AD petition, the expected national welfare level as a result of liberalization ( $E[V]$ ) is

$$E[V] = \alpha V_{1A} + (1 - \alpha) V_{1B} \quad (9)$$

$E[V]$ , then, is the convex combination of welfare levels when a petition is successful and when it is not. Since both  $V_{1A}$  and  $V_{1B}$  can be greater than, less than or equal to  $V_0$ ,  $E[V]$  can also be greater than, less than or equal to  $V_0$ . In other words, the welfare effect of trade liberalization, when an anti-dumping procedure is implemented and used, is indeterminate.

#### IV. Simulation Results

We have demonstrated theoretically that a trade reform combined with a

new AD process might lead to lower welfare. We turn now to the results of a set of simulations of an economy implementing the reform described above. In particular, we try to determine whether plausible parameter values can generate instances in which welfare may fall subsequent to the reform. We consider simulations from two different perspectives. The first is prior to the implementation of the reform (*EX ANTE*) and compares the pre-liberalization welfare levels with expected welfare. The second perspective (*EX POST*) analyzes the welfare effects after the reform is implemented and all uncertainty is resolved.

### ***A. EX ANTE Simulations***

For these simulations, we allow the following parameters to vary: 1) degree of initial liberalization, 2) the probability of AD success, and 3) the cost of pursuing an AD strategy. Initially we consider expected welfare effects of liberalization prior to implementation of the reform. Consequently we will consider the percentage change between pre-liberalization welfare levels ( $V_0$ ) and post-liberalization expected welfare levels when we allow the industry to opt to file an AD petition.

For each parameter combination, we calculate  $\tilde{\alpha}$  and determine whether the  $X$ -industry will opt to file an antidumping petition. Because we consider only cases where a general trade liberalization has taken place (*i.e.*, where  $T_1 < T_0$ ), if the industry does not file a petition, then expected welfare necessarily rises. These outcomes are denoted **NO-AD** in Tables 2 and 3 below.

Whenever the parameter values are such that the industry files the petition, we divide the outcomes into two categories. We label as **GAIN** those cases where the post-liberalization expected value is greater than the welfare level before the trade reform (*i.e.*, where  $E[V] > V_0$ ). On the other hand, if the pursuit of AD results in a lower expected welfare than prior to the trade liberalization, the outcome will be labeled **LOSS**.

Assumptions for the parameter values and implied variable levels are summarized in Table 1. The consumption share of the importable ( $\mu$ ) is equal to 20% while the share of labor in  $X$ -production ( $\gamma$ ) is also 20%. The international price of  $X$  in terms of  $Y$ , assumed to be 5, generates net imports of  $X$  in this simple economy. The labor endowment equals 1000

**Table 1**  
**Base-Case Values**

Production functions:		X-industry	$X = ZK_0^{1-\gamma}L_x^\gamma$ where $Z = 20$ $K_0 = 5$ $\gamma = 0.2$				
		Y-industry	$Y = a_y L_y$ where $a_y = 10$				
Direct utility function:		$U = X^\mu Y^{1-\mu}$		where $\mu = 0.20$			
Prices: $P = 5$ $w = 10$		Labor endowment: $\bar{L} = 1000$					
Base tariff ( $T_0$ )	Profit in X	X-production	Labor used in X	Y-production	Labor used in Y	Utility level	Income (at domestic Prices)
50%	789	131	19.7	9802	981.3	4541	11207
40%	724	129	18.1	9818	982.9	4560	11099
30%	660	126	16.5	9834	983.5	4576	10976

workers, each of whom receives a wage of 10.<sup>14</sup> In Table 1 we also present calculated base-case values for important variables for the three different pre-liberalization tariff rates used in the simulations.

We allow the pre-reform tariff levels to take on three different values: 30%, 40% and 50%. These are meant to represent a plausible range of values for tariff-equivalent barriers in many reforming countries. We have little empirical evidence concerning petitioning costs ( $wL_A$ ). We assume that these costs range from 0 to 10 workers, each of which is paid the going wage of 10. In order, to help evaluate whether this is a plausible number, we calculate below the labor cost of petitioning as a percentage of profits in the X-industry.

Other parameter values were drawn from U.S. experience with antidumping laws in the 1980s. This reflects the fact that many of the countries implementing AD procedures are looking foremost at US law and regulations as a model for their own rules. We assume that the AD process in this liberalizing country will be equally restrictive to that currently in place in the United States. We use, therefore, an antidumping duty imposed of 34%.<sup>15</sup> We restrict the probability of a successful AD petition to range from 10% to no greater

14. A range of other values for these parameters were used in simulations not reported here. The results parallel those discussed below.

15. Baldwin and Moore [1991].

**Table 2**  
**Summary of Simulations**  
( $T_A = 34\%$ )

Probability of AD success	$\alpha = 0.10$			$\alpha = 0.25$			$\alpha = 0.50$		
Pre-reform Tariff level ( $T_0$ )	30%	40%	50%	30%	40%	50%	30%	40%	50%
<b>LOSS</b> (% of cases)	5%	2.5%	2%	36.7%	21.2%	15%	91.7%	73.7%	56%
Average % change in welfare if <b>LOSS</b>	-0.086	-0.102	-0.089	-0.251	-0.273	-0.287	-0.599	-0.557	-0.553
<b>GAIN</b> (% of cases)	25%	27.5%	28%	23.3%	38.7%	45%	8.3%	26.2%	44%
Average % change in welfare if <b>GAIN</b>	0.276	0.494	0.757	0.173	0.347	0.590	0.103	0.225	0.408
<b>NO-AD</b> (% of cases)	70%	70%	70%	40%	40%	40%	0%	0%	0%
Average % change in Welfare if <b>NO-AD</b> petition is filed	0.418	0.656	0.921	0.418	0.656	0.921	n.a.	n.a.	n.a.
Number of simulations	60	80	100	60	80	100	60	80	100

than 50%.<sup>16</sup>

The results of the simulations are summarized in Table 2. We show the percentage of outcomes that fall into the three categories (**LOSS**, **GAIN** and **NO-AD**) for three separate initial pre-reform tariff rates (30%, 40% and 50%) and three different AD success probabilities (0.10, 0.25, and 0.50). Post-liberalization base tariffs increase in 5% increments from free-trade to the pre-reform tariffs. As indicated above, values for  $L_A$  range from 0 to 10.

Many expected regularities appear in the simulations. Clearly, the lower the probability of AD success, the more likely that welfare will increase.

16. In the United States, the Department of Commerce finds dumping in nearly 95% of all cases filed. However, the International Trade Commission, which must concur before a duty may be imposed, rules affirmatively in about 65% of cases. (See Moore [1992].) Since many import-competing firms will not actually file a petition because of insufficient expected benefits, a 50% success rate seems a reasonable **upper** limit of AD success rates.

Consider those cases when the pre-reform tariff equals 50%. If  $\alpha = 0.10$ , then welfare falls in only 2% of the cases. In fact, for this set of parameters no AD petition is filed in 70% of the simulations. However, if the probability of a successful petition increases to 25%, AD petitions are filed in 60% of the cases. Nevertheless, only 15% of the cases actually result in a reduction in national welfare from pre-reform levels. If the probability of success in the AD process increases to 50%, then an AD duty is filed in 100% of the cases considered. In addition, a majority of the cases (56%) result in lower expected welfare than prior to the liberalization. In output not displayed here, we find that when  $\alpha = 0.50$  and  $T_0 = 50\%$ , the post-reform base tariff rate must fall to 5% in order to guarantee an expected increase in welfare.

The other regularity that stands out is that the lower is the pre-reform tariff level, the more likely it is that the simultaneous introduction of an AD process that offers an average of 34% will result in lower welfare. Consider for example the columns where  $\alpha = 0.25$ . As  $T_0$  rises from 30% to 50%, the number of instances where the reform results in lower welfare falls from 36.7% to only 15%. The percentage of cases where welfare improves (not including **NO-AD**) jumps from 23.3% to 45%. These results are certainly as expected. The larger is the initial tariff, the wider the range of possible outcomes where, even if AD petitions are filed, welfare might still rise.

We now consider some individual outcomes with particular parameter values. These results are displayed in Table 3.

**Table 3**  
**Individual Simulation Results**

	Case #1	Case #2	Case #3	Case #4	Case #5
$wL_A/\mathbb{E}_A$	2%	3%	0%	2.7%	1.4%
Probability of AD success	10%	10%	10%	50%	50%
Pre-reform Base Tariff	50%	50%	50%	50%	50%
Post-reform Base Tariff	45%	45%	45%	5%	5%
AD duty	34%	34%	34%	34%	34%
Breakeven probability	8.8%	13.2%	0%	9%	4.7%
File AD petition?	yes	no	yes	yes	yes
Expected change in welfare ( $E[V]-V_0$ )	-0.14%	+0.21%	+0.05%	-0.07%	+0.02%

The first three outcomes differ only with respect to the petitioning costs ( $wL_A/\pi_A$ ). The probability of AD success is low (10%) and pre-reform tariff rates are high (50%). As discussed above, these are the combinations where a welfare decrease are least likely. Nevertheless, an interesting pattern is shown. In Case #1, welfare falls subsequent to a reform despite the low probability of an AD success. The reasons involve two factors. The initial liberalization is quite small (a drop from 50% to 45%) so that if no AD petition were filed, welfare would have increased only 0.2% (see Case #2). However, the industry does file given the petitioning costs in Case #1, even though  $\alpha = 0.10$ . While the cost of lobbying is only 2.1% of industry profit, this cost combined with the non-trivial chance of obtaining a 34% AD duty is enough to outweigh the initial benefits of trade liberalization and results in a decrease in national welfare of 0.14%.

Case #2 is identical to Case #1 except that lobbying costs are marginally higher (3% of profits vs. 2%). This increase is enough to discourage the industry from petitioning so that a 0.2% welfare improvement is realized. In Case #3, petitioning costs are lowered to zero so that the industry incurs no cost from pursuing AD. However, despite the protection-seeking, an improvement in expected welfare of 0.05% is obtained.

These three cases point out the complicated effects of changing the hurdles facing firms that might file antidumping petitions. Welfare is not monotonically decreasing as  $L_A$  is increased.<sup>17</sup> As AD costs rise, welfare first falls and then rises. This is a consequence of the two-sided nature of increasing these barriers into entering the AD process. On the one hand, increasing  $L_A$  means that there will be larger welfare damage if industries pursue antidumping duties. On the other hand, as the costs to firms increase, fewer firms will find it in their interest to petition.

Cases #4 and #5 provide us with another lesson. Suppose that the AD rules are written so leniently that the import-competing industry has a 50% chance of obtaining some relief. In this instance, the only way to get an improvement is to *combine* a large initial liberalization with low costs of AD petitioning. We see for example in Case #4 that a steep reduction in base tariffs from 50% to 5% combined with lobbying costs representing only 2.7% of

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17. This pattern is repeated in all of the sets of simulations summarized in Table 2.

industry profits will result in lower expected welfare. However, if we cut the cost of filing AD petitions by half, then in Case #5 expected welfare would rise, if only by 0.02%. Once again, we encounter the ambiguous nature of reducing  $L_A$ . If an industry will definitely file an AD petition, then these costs should be minimized to lessen the welfare implications. We also learn that the hoped-for benefits of even large-scale liberalizations can be overwhelmed if the AD process is attractive enough to import-competing firms.<sup>18</sup>

### ***B. EX POST Simulations***

In the previous section, we analyzed a two-sector economy where liberalization occurred in a single import-competing sector and where an affirmative AD decision resulted in the average AD duty of 34%. However, in “real world” liberalizations, tariff cuts apply to many import-competing industries and only a subset of firms apply for an AD duty. Thus, the effects of AD duties might have been overstated in the analysis above.

In order to address these concerns, we consider the following alternative simulations. We assume that the original tariff level equals 50% but consider lower average dumping duties of either 10% or 30%. We interpret these to be the trade-weighted average on the import-competing sector as a whole, rather than that received by a particular industry. Other firms will continue to receive the liberalized base tariff rate. Using the trade-weighted average allows us to ignore  $\alpha$  since we implicitly have included those firms not receiving AD protection by considering an AD duty below 34%. This provides an *ex post* view of liberalization since the uncertainty has been removed.

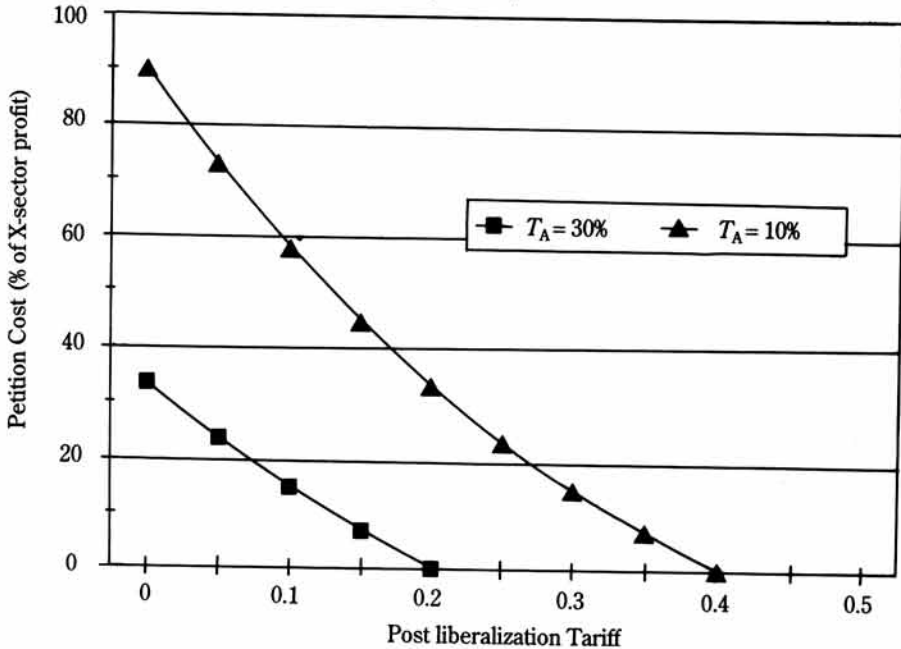
We consider combinations of petitioning costs and the new base tariff rate ( $T_1$ ) that would result in no change in welfare from pre- and post liberalization. We conduct this set of simulations for the weighted average AD duties of both 10% and 30%. The results are summarized in Figure 1.

The results clearly show the welfare tradeoffs between AD duties, degrees of liberalization and petitioning costs. Points on the “indifference” curves in Figure 1 show combinations of  $T_1$  and petitioning costs that yield

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18. This same pattern is evident even if tariffs are lowered to zero for this set of parameters.

**Figure 1**  
**Combinations of  $T_1$  and AD Costs such that Welfare Does Not Change**  
 ( $T_0 = 50\%$ )



equal welfare before and after a liberalization. Combinations to the “north-east” of the curves are those that yield lower levels of welfare after a liberalization.

We find that as liberalization increases, petitioning costs must rise at a faster rate in order for welfare to remain the same. This suggests that, at least for these functional forms and parameter values, the welfare costs of  $L_A$  decrease as  $T_1$  falls.

As expected, the lower are AD duties, the more likely that even small liberalizations and costly petitioning processes will not wholly thwart the reform process. For example, suppose that base tariffs are lowered to 15% from 50%. If weighted-average AD rates are only 10%, then petitioning costs must rise to over 40% of the entire import-competing sector’s profits in order to decrease welfare *vis-a-vis* pre-liberalization. If AD duties are 30%, petition costs need only exceed about 7% of the importable sector’s profits to completely swamp the initial benefits of liberalization.

However, it is worth noting once again that a welfare-improvement is not guaranteed simply by reducing  $L_A$ . As it falls, more firms are likely to apply



and win an AD petition, making the average AD duties larger. Even if petition costs are zero, a liberalization will not insure that welfare will be higher unless the difference between the original and new base tariffs are lower than the new average AD duties.

## V. Conclusion

In this paper we have considered the national welfare implications of a trade policy reform increasingly common in many trade-liberalizing countries, *i.e.*, lower tariffs combined with the introduction of new administered protection procedures, especially antidumping processes.

In the theoretical model, we found that it is possible that this combination of policies can result in lower welfare than prior to the reform. We assumed that an industry must expend resources to obtain protection but that the provision of this protection is uncertain. The expected effects of any given trade reform will consequently depend on the amount of resources used in petitioning for an AD duty and the probability of a successful petition. In addition, the degree to which base tariffs are lowered as part of the reform is also critical to overall effects when firms can seek AD duties.

In simulations, we have found that welfare may fall with the introduction of an AD process under many plausible scenarios. Neither large liberalizations nor low AD success probabilities are sufficient by themselves to guarantee welfare improvement.

These results highlight the importance of administered protection rules and their implementation in determining the welfare effects of trade liberalization. These rules and procedures translate into the probabilities and petitioning costs in the model. For example, we have shown that there is a subtle tradeoff between the petitioning costs and the final welfare effects. Rules can be written so that petitioning costs are small, thereby reducing the direct welfare consequences of filing a petition. However, the low filing costs will also induce more industries to petition, thereby raising the welfare loss. If petitioning costs are set high, few industries will file but those that do will cause a relatively large drop in welfare.

Moreover, the benefits of trade liberalization can potentially be eroded over time if the antidumping rules are lax. Advocates of trade liberalization

must consider not only the overall tariff reduction but also the details of "unfair" trade remedy laws.

The possibility of welfare-reduction is perhaps even greater than suggested in this paper since antidumping procedures are certainly not the only means to obtain administered protection. Countervailing duty cases, escape clause petitions, and other less formal resource-using procedures can all reduce the benefits of overall trade liberalization.

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