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BEFORE THE UNITED STATES  
INTERNATIONAL TRADE COMMISSION

Stainless Steel and Alloy Tool  
Steel, No. TA-203-16

Prehearing Brief of the  
Federal Trade Commission  
March 27, 1987

Prehearing Brief by the  
Federal Trade Commission

Introduction and Summary

Continuing the present import tariffs and quotas for specialty steel could impose an annual cost on United States consumers of about \$44 million, which averages out to an annual cost of about \$83,000 for each job protected in the domestic specialty steel industry. Continuing to restrict imports of specialty steel by quotas could also adversely affect competition in the domestic industry.

The domestic specialty steel industry has had import relief for most of the last eleven years. In 1976 the President, following an "escape clause" investigation by the International Trade Commission ("ITC"), established import quotas for various types of specialty steel. 41 Fed. Reg. 24101 (June 15, 1976). The President, over the objection of the domestic industry, permitted this import relief to expire in February 1980. 44 Fed. Reg. 41362 (July 16, 1979). Following another escape clause investigation by the ITC, the President, in July 1983, authorized another four years of import relief in the form of tariffs for stainless steel sheet, strip, and plate and global quotas for stainless steel bar and rods and alloy tool steel. 48 Fed. Reg. 31177 (July 7, 1983).

The Specialty Steel Industry of the United States and the United Steelworkers of America (AFL-CIO) have now petitioned, pursuant to 19 U.S.C. § 2253(i)(3), to have this import relief

continue for another three years at a "level of relief . . . no less than the level currently in effect." (pet. at 33). The petitioners imply that even another three years may not be long enough, as "[t]he fundamental causes of the import problem -- world over-capacity and trade distorting practices . . . probably will not be resolved in the short-term." (pet. at iii).

One of the major purposes of the escape clause is "to assist industries, firm [sic], workers, and communities to adjust to changes in international trade flows." 19 U.S.C. § 2102(4). The petition alleges that during the last 3 1/2 years the domestic industry has undertaken numerous investments that have lowered its production costs (pet. at 19-21). Energy costs also declined (id. at 15). The petition gives data on various indicia of industry performance for the three full years of "free trade" (1980-1982) and the first two full years of the current period of import relief (1984 and 1985). These data indicate that there has been an increase in the domestic industry's output, capacity utilization rate, net operating profits, net sales, and net

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profits as a percentage of sales.<sup>1</sup> The petitioners claim, however, that imports remain high, prices have declined, and the domestic industry needs three additional years of import relief in order to complete its modernization program (id. at 12-14, 26-27).

The statute directs the ITC to "advise the President of its judgment as to the probable economic effect on such industry of . . . termination" of import relief. 19 U.S.C. § 2253(i)(3). The ITC "shall take into account all economic factors which it considers relevant, including . . . the effect of import relief on consumers . . . and on competition in the domestic markets for such articles." 19 U.S.C. §§ 2252(c)(4), 2253(i)(4). The Federal Trade Commission ("FTC"), which enforces the antitrust laws in order to promote competition for the benefit of American consumers, wishes to offer its views on these two economic factors.

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1 Annual output for stainless steel and alloy tool steel rose by 21 percent, from an average of 924,000 tons in 1980-1982 to an average of 1,118,000 tons in 1984-1986 (pet. at Table 8). Capacity utilization for stainless steel and alloy tool steel was below 59 percent in 1980-1982 and above 65 percent for 1984-1986 (pet. at Table 9). Annual net operating profits averaged \$73 million in 1980-1982, as compared to \$164 million in 1984-1985 (pet. at Table 11). Annual net sales averaged \$2.3 billion in 1980-1982, as compared to \$2.6 billion in 1984-1985 (id.). Annual net operating profits as a percentage of net sales was about 3 percent in 1980-1982, as compared to about 6 percent in 1984-1985 (id.).

## Argument

### I. Restricting imports imposes costs on United States consumers.

In advising the President, the ITC is to take into account, inter alia, "the effect of import relief on consumers."<sup>2</sup> 19 U.S.C. §§ 2252(c)(4), 2253(i)(4). The petition asserts (at 31) "There has been minimal adverse effect of the existing relief program on consumers. Prices for many high-volume products have declined, and price increases on others have been small." However, the petitioners' comparison of current prices with past

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#### 2 The Senate stated

"With regard to the effect of relief on consumers, the Committee feels that the goals of the Employment Act of 1946 should be paramount. Unemployed persons are not happy consumers. The Executive should not confuse the effect on consumers with the effect on importers or foreign producers; they are not the same. If the choice is between (1) allowing an industry to collapse and thereby creating greater unemployment, larger Federal or state unemployment compensation payments, reduced tax revenues, and all the other costs to the economy associated with high unemployment, or (2) temporarily protecting that industry from excessive imports at some marginal costs to the consumer, then the Committee feels that the President should adopt the latter course and protect the industry and the jobs associated with that industry." S. Rep. No. 1298, 93d Cong., 2d Sess. (1974) at 125.

This investigation does not appear to present the stark choice considered by the Senate. First, the estimates of Dr. Tarr, discussed in the text, indicate that the costs to consumers for each job protected are quite high. Moreover, there is no claim by petitioners that the domestic industry will "collapse" if import relief is terminated. Finally, it is not clear that the petitioners seek only "temporary" protection. Escape clause relief has been in effect about 70 percent of the time over the last eleven years; the petitioners seek an additional three years of import relief and imply that, even at the end of this additional period, the industry may continue to need relief.

prices is misleading. The appropriate test is to compare current prices with the price that would have existed if there had been no import relief.

As discussed in more detail in the Appendix, Dr. David Tarr of our Bureau of Economics has estimated the gains to United States consumers and the United States economy<sup>3</sup> of allowing the tariffs and quotas to expire as scheduled. These gains are estimated separately for a removal of the current 4 percent tariff surcharge on stainless steel sheet, strip and plate<sup>4</sup> and

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3 The gain to the economy is the gain to consumers reduced by any losses of revenue to the government or losses to other sectors of the economy, such as producers, flowing from the particular policy chosen.

4 As part of the President's general program for the entire steel industry, the United States has also negotiated voluntary restraint agreements ("VRAs") with many foreign countries that limit the amount of some of the specialty steel products involved in this proceeding that can be exported to the United States. Petitioners allege that these agreements have not established an effective binding quota for United States imports of these products (pet. at 7-8). Dr. Tarr's analysis assumes this allegation is correct and treats the tariff as the only form of import relief for these products.

In the event that this allegation by the petitioners is not accurate, and the VRAs do represent a binding restraint on imports of stainless steel flat products (even in the presence of the current four percent tariff surcharge), then the estimates of Dr. Tarr for flat rolled products would not apply. Instead, removal of the tariff on stainless flat rolled products would result in no gains to consumers and no jobs lost. Moreover, removal of the tariff would result in a loss to the economy because tariff surcharge revenue on flat products would be transferred to foreigners as additional quota rents.

With the exception of the European Economic Community, the VRAs essentially do not cover stainless steel bars and rods and alloy tool steel. Thus, the VRAs are not a binding restraint for this portion of the industry and the estimates for this section of the industry are not affected by them.

Continued

for a removal of the quotas on stainless steel bars and rods and alloy tool steel. The separate estimates are then combined to arrive at aggregate gains to consumers and the economy from allowing both parts of the protection to expire.

As shown in Table 1, the annual gains to United States consumers of terminating the relief to both sectors of the industry are about \$44 million; the annual gains to the United States economy are about \$27 million. The reason for the difference between the numbers is that part of the gain to domestic consumers comes from losses to United States producers of these products, which will reduce the net gain to the economy as a whole. Domestic producers stand to lose about \$10 million from termination of the relief. Similarly, part of what both United States consumers and the United States economy gain comes from foreigners, who will lose about \$21 million per year due to removal of the quotas.

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See the Appendix for details.



TABLE 1

ESTIMATED ANNUAL GAINS TO CONSUMERS AND THE ECONOMY  
FROM REMOVAL OF TARIFFS AND QUOTASTariff Removal on Stainless Steel Sheet, Strip and Plate  
and Quota Removal on Stainless Steel Bars and  
Rods and Alloy Tool Steel

(millions of 1986 dollars)

	COMBINED	SHEET, STRIP & PLATE	BARS & RODS & ALLOY TOOL STEEL
1. GAINS TO CONSUMERS	44.3	21.9	22.4
2. Losses of Domestic Producers	9.7	9.6	0.1
3. Recaptured Quota Rents from Foreigners	21.2	0	21.2
4. GAINS TO THE U.S. ECONOMY*	26.6	3.2	23.4

\*For a more detailed table, with changes in tariff revenues and other relevant estimates of gains to the economy and how these gains to the economy can be derived from the elements in the same column, see Table 1 of the Appendix.

SOURCE: Appendix

To gain some perspective on the quantitative importance of the gains to consumers in relation to the possible unemployment costs to workers in the relevant industry, Dr. Tarr has also calculated annual costs per job protected. For each job protected by the current combined level of protection, consumers lose about \$83,000 per year, while the United States economy loses about \$50,000 per year. Examining the estimates for the separate sectors of the industry reveals that the costs to the economy per job are dramatically higher for the sector where quota protection is employed than they are for the sector that receives tariff protection. For example, the annual costs to the economy per job are about \$135,000 for quota protection on stainless steel bars and rods and alloy tool steel, but only about \$14,000 for tariff protection on stainless steel sheet, strip and plate. The main reason for this disparity is that, due to restricted supply, quotas allow rents to be captured by foreigners, whereas tariffs capture this amount as revenue for the United States Treasury. These estimates, which are summarized in Table 2, provide further evidence of the highly inefficient nature of allocating unauctioned quotas to foreigners. That is, allowing foreign governments the right to determine who exports to the United States under the quota, rather than auctioning (or giving) that right or license to United States citizens, results in significantly higher costs to the United States.<sup>5</sup>

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5 Dr. Tarr's analysis assumes the quotas are allocated to foreigners and are not auctioned. The FTC has previously  
Continued

TABLE 2

ANNUAL COSTS TO CONSUMERS AND THE ECONOMY  
FOR EACH JOB PROTECTED

Tariff Removal on Stainless Steel Sheet, Strip, and Plate  
and Quota Removal on Stainless Steel Bars and Rods and  
Alloy Tool Steel

(thousands of 1986 dollars)

	COMBINED*	SHEET, STRIP & PLATE	BARS, RODS & ALLOY TOOL STEEL
COSTS TO CONSUMERS PER JOB	82.6	60.5	128.5
COSTS TO THE ECONOMY PER JOB	49.7	13.9	134.7

\*The estimates for the combined industry are a weighted average of the estimates for the two sectors.

Source: Appendix

argued that import quotas, if they are imposed, should be auctioned pursuant to 19 U.S.C. § 2581. Prehearing Brief on Remedy in Carbon and Certain Alloy Steel Products, TA-201-51 (June 1984) at 13-14, 25-27; Prehearing Brief in Nonrubber Footwear, TA-201-55 (April 1985) at 15. The ITC recommended such an auction in NonRubber Footwear, TA-201-55 (July 1985). Auctions have been used in Australia to partially allocate import quotas on textiles, clothing, footwear, and motor vehicles. "Selling Quotas," National Journal (February 14, 1987) at 370-73; Industries Assistance Commission, Annual Report 1984-85 (Canberra: Australian Government Publishing Service, 1985) at 98-99. Even without an auction, the costs to the United States economy would be reduced by the same amount as through auctioning, if import licenses were allocated to United States importers rather than foreigners.

The estimates of costs per job do not include the costs of providing a job that are borne by the employer. That is, they exclude the wages and other costs of providing employment in an industry. Moreover, they underestimate the cost per net job saved, since they ignore the jobs lost elsewhere in the United States because of the restrictions on specialty steel imports. Since trade restrictions may not increase employment on an economy-wide basis,<sup>6</sup> the jobs protected in stainless steel may be lost elsewhere in the economy, and these estimates are to be interpreted as the costs of providing employment in specialty steel at the expense of employment elsewhere.

Dr. Tarr's cost estimates are also conservative in that he assumes that the domestic specialty steel industry will be competitive regardless of whether imports are restricted. As discussed below, it is possible that restricting imports of specialty steel by means of quotas may permit the domestic firms to raise prices above their competitive levels, thereby imposing additional costs on United States consumers and the economy.

II. Restricting imports by quotas may have an adverse effect on competition.

In addition to the effects on consumers, the President is to consider the effect of continued import relief "on competition in the domestic markets for such articles." 19 U.S.C. §

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6 See M.E. Morkre and D.G. Tarr, Effects of Restrictions on United States Imports: Five Case Studies and Theory (Bureau of Economics Report to the FTC 1980) at 2-3; K. Clements and L. Sjaastad, How Protection Taxes Exporters (London: Trade Policy Research Centre 1984).

2252(c)(4). The ITC is to take this effect "into account" when it advises the President. 19 U.S.C. § 2253(i)(4). Petitioners have not addressed this statutory criterion (pet. at 30-32) even though the ITC staff found in 1983 that "The speciality steel industry . . . is highly concentrated, with a few producers accounting for the bulk of shipments in each product line." Stainless and Alloy Tool Steel, TA-201-48 (May 1983) at A-14.

The ITC's assessment of the probable impact of import relief on competition could proceed along the following lines:

1. The ITC would need first to make a determination of the extent to which the industry is concentrated. Based on the confidential data that it has collected, ITC staff should be able to calculate market shares of the firms in the industry, from which concentration measures can be determined. Since, in fulfillment of its fact-finding role, the ITC staff found the industry to be highly concentrated in 1983, this kind of determination has presumably already been done.<sup>7</sup> It would merely need to be updated. If the data reveal that there has been exit from the industry without new entry, then the industry would be more concentrated than it was found to be in 1983.

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7 For the concentration figures to be most meaningful, they should be calculated for a relevant product and geographic market. For discussions of this concept, see Statement of Federal Trade Commission Concerning Horizontal Mergers (June 14, 1982) at § VI; Department of Justice, "1984 Merger Guidelines," 49 Fed. Reg. 26823 (June 29, 1984) at § 2; D. T. Scheffman and P. T. Spiller, "Geographic Market Definition Under the DOJ Guidelines," Journal of Law and Economics, Forthcoming.

2. The ITC would need to assess the extent to which there are barriers to entry that would prevent firms from entering the market when prices exceed costs. This would include an assessment of the likelihood of new entry by domestic firms in the event that prices should rise. In this connection, we ask that the ITC take special note of the differential impact on competition that tariffs and quotas may have in a concentrated industry.

The point is simply that while a tariff increases domestic prices, domestic prices will increase at most by the amount of the tariff, regardless of the actions of domestic producers. If the domestic industry were very concentrated and domestic producers sought to raise prices further by collusively reducing output, they would be unsuccessful in raising prices by more than the amount of the tariff because further price increases would lead to large increases in imports. While import quotas also increase domestic prices, quotas impose an absolute limit on imports that does not depend on the domestic price level. For this reason, the domestic price level in industries subject to binding import quotas can be increased by the output decisions of domestic producers. The imposition of import quotas on a concentrated industry may therefore lead to strategic interaction or successful collusion that will induce a greater output reduction and domestic price increase than would occur in a competitive industry. Thus, for concentrated industries, tariffs have a much less adverse effect on competition than quotas. See C.P. Kindleberger, International Economics (1968) at 130-134 and

Appendix E; M.E. Morkre and D.G. Tarr, Effects of Restrictions on United States Imports: Five Case Studies and Theory (Bureau of Economics Report to the FTC 1980) at 28-31.

3. In addition to considering market concentration and potential barriers to entry, the ITC should consider a number of other factors (the rate of technological change, forms of competition, etc.) that can affect the ability of domestic firms to raise prices above marginal costs.<sup>8</sup> Since high concentration and entry barriers are not sufficient to reliably predict anticompetitive behavior, an analysis of these other factors is essential in reaching a determination concerning the likely competitive effects of a tariff or quota.<sup>9</sup>

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8 For an extensive list of factors that may affect the likelihood of successful collusion, see Statement of Federal Trade Commission Concerning Horizontal Mergers (June 14, 1982) at § III; Department of Justice, "1984 Merger Guidelines," 49 Fed. Reg. 26823 (June 29, 1984) at §§ 3.2-3.45; and commentators such as F.M. Scherer, Industrial Market Structure and Economic Performance, 2d ed. (1980) at chs. 6 and 7; R.A. Posner, Antitrust Law (1976) at 55-61.

9 We note that in 1984 the Department of Justice challenged a domestic merger in a closely related product market of stainless cold rolled sheet and strip. United States v. The LTV Corp., 49 Fed. Reg. 13603 (April 5, 1984).

Conclusion

For the reasons stated above, we suggest that the ITC find that there is a cost to American consumers of restricting imports and that the ITC, using its confidential data, employ the methodology set forth above in analyzing the effects on competition of restricting imports of specialty steel.

Respectfully submitted on behalf  
of the Federal Trade Commission,

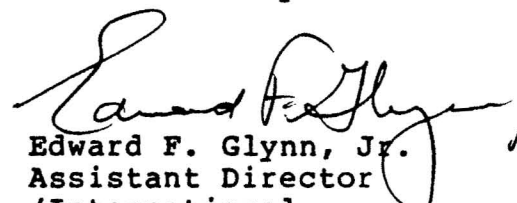
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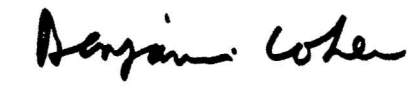
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## APPENDIX

COSTS TO CONSUMERS, COSTS TO THE ECONOMY AND COSTS PER JOB PROTECTED:  
Effects of Extending Tariffs on Stainless Steel Sheet, Strip and Plate  
and Quotas on Stainless Steel Bars and Rods and Alloy Tool Steel

DAVID G. TARR<sup>1</sup>

### INTRODUCTION AND SUMMARY OF RESULTS

Recently the United Steelworkers of America and the Specialty Steel Industry of the United States petitioned the United States International Trade

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<sup>1</sup>Dr. Tarr received his Ph.D. from Brown University in 1970 and before joining the FTC served on the faculty of the Ohio State University. He has authored a number of publications on the steel industry and on estimating the costs and benefits of trade restrictions. These include: the FTC Staff Steel Report, Bureau of Economics report to the FTC, 1977 (with others); The Effects of Restrictions on United States Imports, Bureau of Economics report to the FTC, 1980 (with Morris Morkre); Aggregate Costs to the United States of Tariffs and Quotas on Imports, see attached references (with Morris Morkre); "Cyclical Dumping: The Case of Steel Products," Journal of International Economics, February 1979; "The Efficient Diffusion of Steel Technology Across Nations," Journal of Public Policy, 1985; "The Effects of Restraining Korean and Other Steel Exports to the United States and the European Community," The World Bank Economic Review, forthcoming. In addition, he has published numerous articles in the leading economics journals including Econometrica, The Review of Economic Studies, The Quarterly Journal of Economics, The Southern Economic Journal and The Western Economic Journal.

He would like to acknowledge the helpful comments of Mark Frankena and Paul Pautler.

Commission (USITC or ITC) for an extension of relief under section 203 of the Trade Act of 1974.<sup>2</sup> In that "Petition" they asked for continuation of relief at a level no less than that which is currently in effect. When the President granted relief, he granted a tariff surcharge on stainless steel sheet, strip and plate (which is currently at the level of 4 percent) and quotas on stainless steel bars and rods and alloy tool steel.<sup>3</sup> In this paper the gains to US consumers and the US economy of allowing the tariffs and quotas to expire as scheduled are estimated. These gains are estimated separately for removing the current 4 percent level of tariff surcharge on stainless steel sheet, strip and plate and for removing the quotas on stainless steel bars and rods and alloy tool steel. The separate estimates are combined to arrive at aggregate gains to consumers and the economy from allowing the protection to

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<sup>2</sup>Stainless Steel and Alloy Tool Steel Petition for Extension of Import Relief Pursuant to Section 203 of the Trade Act of 1974, on behalf of the Specialty Steel Industry of the United States and the United Steelworkers of America, January 14, 1987 (the Petition).

<sup>3</sup>Federal Register, July 7, 1983, pp.31177, 31178.

expire.<sup>4</sup>

The annual gains to US consumers of not extending the relief to either sector of the industry is \$44.3 million; the annual gains to the US economy are \$26.6 million. A significant portion of the gains to the economy, which are also gains to US consumers, is \$21.2 million in quota rents that are recaptured from foreigners. Part of what US consumers gain is taken from US and foreign producers of these products. Domestic producers stand to lose \$9.7 million from termination of the relief, while foreigners will lose \$21.2 million from removal of the quotas on stainless steel bars and rods and alloy tool steel. In addition, as explained in section III, the removal of the protection will result in changes in tariff revenue to the government and a

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<sup>4</sup>The Petition seeks to extend tariffs on flat rolled stainless steel products, despite the fact that it acknowledges that the President's program for the overall steel industry of voluntary restraint agreements (VRAs) with 18 nations or regions, covers flat rolled specialty steel products (namely, stainless steel sheet, strip and plate). It asks for the extension because it alleges that since the VRAs did not provide separate restraint levels for stainless steel flat products, they have provided only limited effectiveness for these products (presumably due to product upgrading problems). Moreover, it alleges that some important suppliers of stainless steel products were not covered by the agreements. Based on this allegation by the Petition, the model assumes that VRAs do not represent a binding restraint on stainless flat products.

In the event that this allegation by the Petition is not accurate, and the VRAs do represent a binding restraint on imports of stainless steel flat products (even in the presence of the current four percent tariff surcharge), then the estimates of this paper for flat rolled products would not apply. Instead, removal of the tariff on stainless flat rolled products would result in no gains to consumers and no jobs lost. Moreover, removal of the tariff would result in a loss to the economy of \$11.4 million. This is the tariff surcharge revenue on flat products; it would be transferred to foreigners as additional quota rents.

With the exception of the European Community, the VRAs essentially do not cover stainless steel bars and rods and alloy tool steel. Thus, the VRAs are not a binding restraint for this portion of the industry and the estimates for this section of the industry are not affected by them.

possible "terms of trade" loss. The estimates for each sector of the industry and the combined estimates are summarized in table 1.

In order to gain some perspective on the quantitative importance of the gains to consumers in relation to the possible unemployment costs to workers in the relevant industry, we have also calculated costs per year per job protected. For each job protected by the current combined level of protection, consumers lose \$82,600 per year and the economy loses \$49,700 per year. Examining the separate sectors of the industry reveals that the costs to the economy per job are dramatically higher for quota protection than they are for tariff protection. In particular, the costs to the economy per job are \$134,700 for quota protection on stainless steel bars and rods and alloy tool steel, but only \$13,900 for tariff protection on stainless steel sheet, strip and plate. The main reason is that quotas allow rents to be captured by foreigners, whereas tariffs capture this amount as revenue for the US Treasury. These estimates are summarized in table 2.

The costs per job estimates do not include the private costs of providing a job. That is, they exclude the wages and other costs of providing employment in an industry. Moreover, trade restrictions cannot be expected to increase employment on an economy-wide basis. Thus, the jobs protected in stainless and alloy tool steel are likely lost elsewhere in the economy, and these estimates are to be interpreted as the costs of providing employment in steel at the expense of employment elsewhere.

For a number of reasons, the estimates may be considered an underestimate of the full costs to the economy. For example, no adjustment was made for the possibility of monopoly restriction of output with a quota in place. With a

TABLE 1

## ESTIMATED ANNUAL GAINS TO CONSUMERS AND THE ECONOMY

## FROM REMOVAL OF THE TARIFFS AND QUOTAS:

Tariff Removal on Stainless Steel Sheet, Strip and Plate  
and Quota Removal on Stainless Steel Bars and Rods and Alloy Tool Steel  
in millions of 1986 dollars

	COMBINED	SHEET, STRIP & PLATE	BARS & RODS & ALLOY TOOL STEEL
1. GAINS TO CONSUMERS	44.3	21.9	22.4
2. Losses of Domestic Producers	9.7	9.6	0.1
3. Recaptured Quota Rents From Foreigners	21.2	0	21.2
4. Reduction in Tariff Surcharge Revenue	11.4	11.4	0
5. Increase in Revenue From Base Tariffs	5.3	4.1	1.2
6. Terms of Trade Loss	1.9	1.8	0.1
7. GAINS TO THE ECONOMY*	26.6	3.2	23.4

\*For any column, gains to the economy (7) are calculated from elements in the same column in the above rows. In particular, gains to the economy are equal to 1 - 2 - 4 + 5 - 6. Item 3 is a gain to both consumers and the economy, and is therefore not deducted from 1 to arrive at 7. Items in the column labelled combined are obtained by adding the two elements in the same row that are in the middle and right hand columns. Due to rounding, the totals, either down a column or across a row, may differ from the sum of the entries in the columns relevant to the total.

SOURCE: Author's calculations.

TABLE 2

## ANNUAL COSTS TO CONSUMERS AND THE ECONOMY

FOR EACH JOB PROTECTED:

Tariff Removal on Stainless Steel Sheet, Strip and Plate  
and Quota Removal on Stainless Steel Bars and Rods and Alloy Tool Steel  
in thousands of 1986 dollars

	COMBINED*	SHEET, STRIP & PLATE	BARS, RODS & ALLOY TOOL STEEL
COSTS TO CONSUMERS PER JOB	82.6	60.5	128.5
COSTS TO THE ECONOMY PER JOB	49.7	13.9	134.7

\*The estimates for the combined industry are a weighted average of the estimates for the two sectors. See section IV for the details.

SOURCE: Author's calculations.

quota in place, the domestic industry can increase its profits if it can restrict its output below the competitive level. If it does so, there are additional costs to consumers and the economy. In addition, there would be fewer jobs protected.<sup>5</sup> This would substantially increase the estimates of costs per job protected. Moreover, as explained in section III, the terms of trade adjustment methodology has overestimated the terms of trade adjustment costs, which results in an underestimate of the gains to the economy.

## II. MODEL AND ASSUMPTIONS

### Differentiated Products

The most reasonable assumption regarding steel products appears to be to treat foreign and domestic steel as differentiated products. Jondrow, et al. (1982) have documented a number of reasons for treating foreign and domestic steel differently. They observe that foreign steel must be ordered further in advance and one must await delivery. This implies greater inventory costs associated with foreign steel. Moreover, they argue that domestic suppliers implicitly offer greater security of supply. Additionally, the econometric estimates of Crandall (1981) argue for the acceptance of a differentiated product model.

In addition to treating foreign and domestic steel as differentiated

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<sup>5</sup>In fact, Corden (1971, pp. 203-206) has shown that if a domestic monopoly exists and if the quota is equal to the original imports, then domestic output and employment will necessarily fall; this is because there is only the monopoly restriction effect and no import substitution effect.

products, it is best to treat stainless steel sheet, strip and plate products (referred to as flat products), as differentiated from the other products in the ITC proceeding.<sup>6</sup> The President, "In recognition of the weaker competitive position of the stainless steel rod, bar and alloy tool steel sectors...", granted quotas to this section of the industry, and tariffs on stainless sheet, strip and plate.<sup>7</sup> Given that the relief is differentiated by section of the industry, the costs to the economy can best be estimated by following the Presidential determination regarding industry structure. We will estimate the appropriate welfare costs for each sector of the industry separately, and then aggregate the cost estimates to obtain the welfare estimates for the combined industry.

#### Model Specification

The model is depicted graphically in figure 1. Panel A is the market for the domestic good and panel B is the market for the imported product. A separate figure would apply for flat and non-flat products. The figure depicts a quota, so it would apply to non-flat products. We adopt the convention that upper case letters represent domestic variables and lower case letters denote import variables. Also the subscript <sub>0</sub> refers to the initial equilibrium and the subscript <sub>1</sub> refers to the equilibrium after the change in the policy action (such as removing a quota). We use P<sub>s</sub> and Q<sub>s</sub> for prices and quantities,

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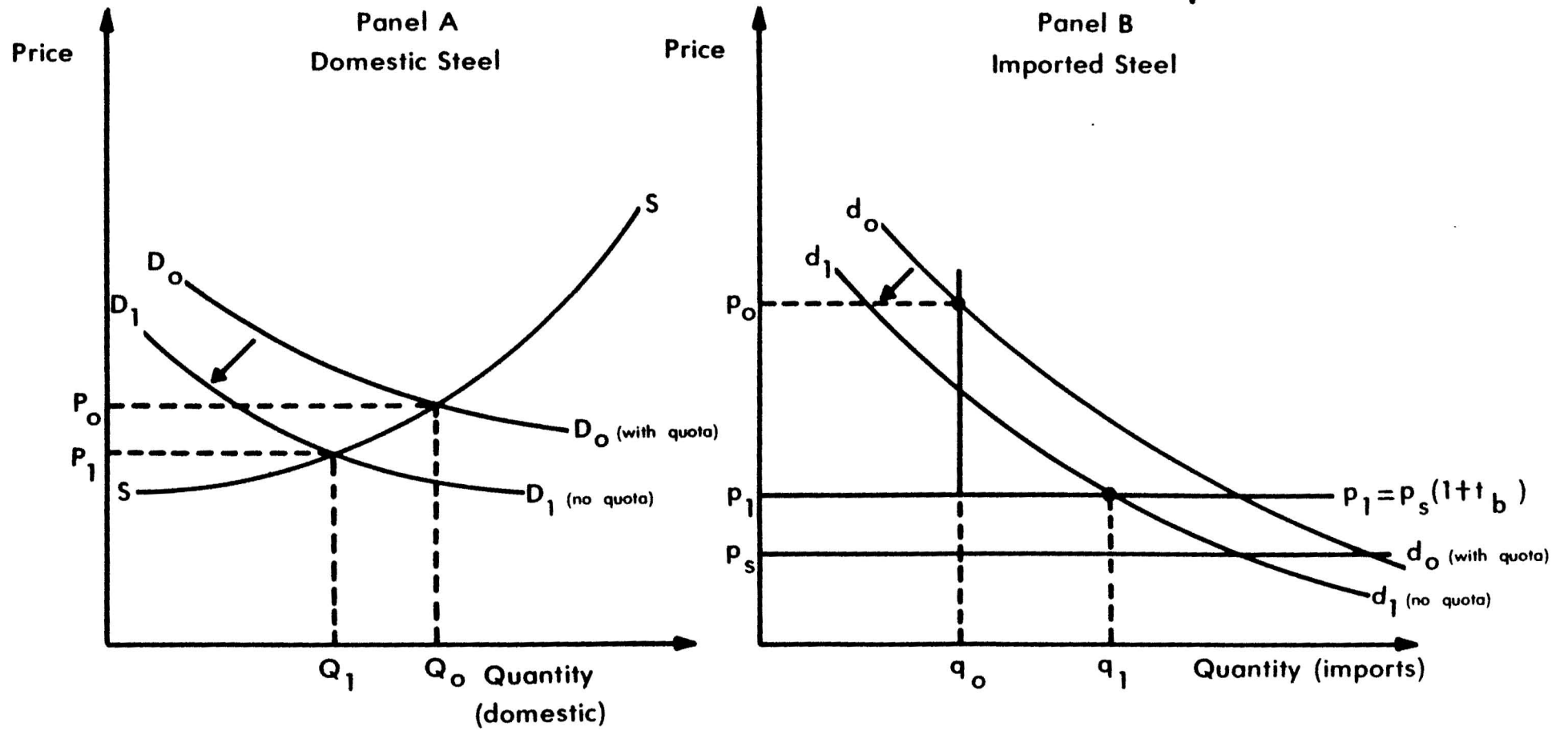
<sup>6</sup>The "other" products in the proceeding are stainless steel rods and bars, and alloy tool steel. Despite the fact that alloy tool steel comes in flat varieties, for convenience of expression the other products will be referred to as non-flat products.

<sup>7</sup>Federal Register, July 7, 1983, p.31177.



FIGURE 1

Effect of Removing a Quota on a Differentiated Import Product With a Rising Domestic Supply Curve



respectively; thus, for example,  $P_0$  refers to a domestic price in the initial equilibrium, and  $q_1$  refers to an imported quantity after the removal of the quota or tariff.

Since the demand curves are related, demand depends on the price of the competing good, as well as having the usual own price dependence. That is, the price of the competing good is a parameter in the demand curve for the domestic good and conversely.<sup>8</sup>

To explicitly model these interactive effects requires specification of demand equations for both goods, a supply equation, and in the case of a quota, the price at which the imported good would be supplied. First consider the case of flat products, which are subject to a temporary tariff surcharge. The following specification is assumed:

- (1)  $\ln(Q) = a + e_1 \ln(P) + e_2 \ln(p)$  (demand for domestic steel)
- (2)  $\ln(q) = b + e_3 \ln(P) + e_4 \ln(p)$  (demand for imported steel)
- (3)  $\ln(Q) = c + e_5 \ln(P)$  (supply of domestic steel)
- (4)  $s(q) = p_s(1 + t_b)(1 + t_s)$  (supply price of imported steel).

Equations 1 and 2 are the demand curves for the domestic and imported goods, respectively. Equation 3 is the supply curve for the domestic product. The coefficients  $e_1$  and  $e_4$  are the own elasticities of demand,  $e_2$  and  $e_3$  are cross elasticities of demand, and  $e_5$  is the elasticity of supply. Equation 4 states that the price at which the imported good is supplied is  $p_s(1 + t_b)(1 + t_s)$ , where  $p_s$  is the delivered price of imports excluding tariffs,  $t_b$  is the base tariff rate in effect for these products, and  $t_s$  is

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<sup>8</sup>This model is explained in more detail in Tarr and Morkre (1984).

the temporary tariff surcharge ordered by the President (equal to 4 percent in the final year of relief)<sup>9</sup>. If the temporary tariff surcharge is not extended, then equation 4 reduces to:

$$(4^*) \quad s(q) = p_s(1 + t_b).$$

Now consider the non-flat products. Although the actual elasticities may differ, the form of equations 1, 2 and 3 are unaltered. Since non-flat products are subject to quotas, however, equation 4 would change to the following:

$$(4) \quad f(p) = q_o \quad p \geq p_s(1 + t_b).$$

Equation 4 states that if imports are limited to  $q_o$ , then exactly  $q_o$  will be imported at any price, provided the price exceeds or equals the import supply price of  $p_s(1 + t_b)$ .

#### Elasticity Assumptions

The best estimates of demand elasticities (the  $e_i$ s in equations 1 and 2) for finished steel products are from Robert Crandall (1981, pp. 180,181). We averaged the two-stage least squares estimates of demand elasticities for flat products (cold rolled sheet and plate) that were available from this source;

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<sup>9</sup>Since tariffs are levied on customs value only, the full version of equation 4 is:  $s(q) = p_s(1 + t_b)(1 + t_s) + D$ , where D is charges related to delivering the product to the US on which tariffs are not levied. These charges include transportation, insurance and some brokerage fees, which must be added to arrive at the delivered tariff inclusive price on imports. Since D has the same value whether a tariff exists or not, the specific value of D does not affect the estimates; thus, without loss of generality, we delete D from the equation to simplify the notation.

since no estimate of rod elasticities was available, we used the estimates of demand elasticities for bar products as our estimate of elasticities for non-flat products.<sup>10</sup> These estimates are summarized in equations 1' and 2' below.

Regarding the supply elasticities, we are considering a period of temporary relief, so less than long-run elasticities are appropriate. Accordingly, the elasticities will be dependent on the level of capacity utilization. Based on data in various ITC publications, it is possible to calculate capacity utilization rates separately for the flat and non-flat sectors of the industry.<sup>11</sup> These data reveal that capacity utilization rates in 1985 for the flat and non-flat sectors were 86 and 52 percent, respectively. Accordingly, the supply elasticity for the non-flat sector should be taken to be quite high, as output can expand significantly (within the range of outputs being considered) without impinging on capacity, while the supply elasticity for the flat sector must be considerably lower. In particular, we take the supply elasticity of the flat sector to be 5, and the supply elasticity of the non-flat sector to be 100.

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<sup>10</sup>The cross-elasticity of demand of US consumers for imported non-flat (bar) products with respect to a change in the price of domestic non-flat (bar) products was taken to be .4. Crandall's estimate for this parameter was not statistically different from zero. We have not used Crandall's estimate for this parameter because our assessment is that these imported and domestic products do substitute for each other, at least to some extent.

We have done a sensitivity analysis with one significantly higher value for this cross-elasticity, namely a value of 1.8, and found that the estimates are not very sensitive to this alternate specification. As a result of using this alternate cross-elasticity, the values in table 1 are unchanged and the values in table 2 change by, at most, one hundred dollars per job.

<sup>11</sup>See USITC publication 1821 (Annual Survey on Certain Stainless Steel and Alloy Tool Steel, March 1986) for capacity data, and USITC publication 1908 (Quarterly Survey on Certain Stainless Steel and Alloy Tool Steel, November 1986) for production data.

Substituting the assumed elasticity values into equations 1-4 for the flat products sector yields:

$$(1') \ln(Q) = a - 1.65 \ln(P) + .93 \ln(p) \quad (\text{demand for domestic flat products})$$

$$(2') \ln(q) = b + 4 \ln(P) - 4.5 \ln(p) \quad (\text{demand for imported flat products})$$

$$(3') \ln(Q) = c + 5 \ln(P) \quad (\text{supply of domestic flat products})$$

$$(4') s(q) = p_s (1 + .094)(1 + .04) \quad (\text{import supply price of flat products})$$

In equation 4' we have substituted 9.4 percent for the base tariff rate on flat products. This is an average of the applicable duty rates on the relevant products, taken from the Tariff Schedule of the United States. We have substituted 4 percent as the temporary tariff surcharge, because this is the tariff rate that is currently in effect, and the Petition asks for a continuation of relief such that "the level of relief should be no less than the level currently in effect."<sup>12</sup>

In the case of non-flat products, we have:

$$(1') \ln(Q) = a - 1.3 \ln(P) + .63 \ln(p) \quad (\text{demand for domestic non-flat products})$$

$$(2') \ln(q) = b + .4 \ln(P) - 1.09 \ln(p) \quad (\text{demand for imported non-flat products})$$

$$(3') \ln(Q) = c + 100 \ln(P) \quad (\text{supply of domestic non-flat products})$$

$$(4') f(p) = q_0 \quad p \geq p_s (1 + .056) \quad (\text{import supply price of non-flat products})$$

where in equation 4' we have substituted 5.6 percent, which is the average of the applicable duty rates on the relevant products, for the base tariff rate.

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<sup>12</sup>See the Petition at page 33.

Selection of Base Year Prices and Quantities

We selected 1985 as the base year, since it is the most recent calendar year for which we had data. The price and quantity data for this year were obtained as follows.

As mentioned above, we divided the industry into sectors we call flat and non-flat. Quantity data on the products in this proceeding are published in USITC quarterly surveys of the industry (in particular, USITC publication 1908). These data can be aggregated into flat and non-flat categories. Subtracting exports from domestic shipments yields domestic production for domestic consumption, which is the desired  $Q_0$  in equations 1-4. Then domestic production in the initial equilibrium of flat and non-flat products is 898,191 and 228,425 thousand short tons, respectively. From the same source, imports of flat and non-flat products in the initial year of 1985,  $q_0$ , were 146,976 and 79,701 thousand short tons, respectively. Thus, equation 4' is:

$$(4') \quad f(p) = 79,701 \quad p \geq p_s(1 + .056).$$

Price information was also obtained from the above mentioned ITC sources. A weighted average of the prices of the subproducts in the categories was developed to obtain prices in the initial equilibrium. The prices of flat products are \$1922.63 and \$2012.78 per short ton, for domestic and imported products, respectively; the prices of non-flat products are \$3260.71 and \$3284.88 per short ton, for domestic and imported products, respectively.

The Estimated New Equilibrium

Solving separately for the flat and non-flat products, we take the prices and quantities observed in 1985 as equilibrium values for the system of

equations 1'-4'. One may substitute these particular price and quantity values into equations 1'-3', leaving three equations in three unknowns: a, b and c. Solving these equations yields: (for flat products)  $a^f = 19.1098$ ,  $b^f = 15.8849$  and  $c^f = -24.099$ ; and (for non-flat products)  $a^{nf} = 17.7544$ ,  $b^{nf} = 16.8760$  and  $c^{nf} = -796.632$ .

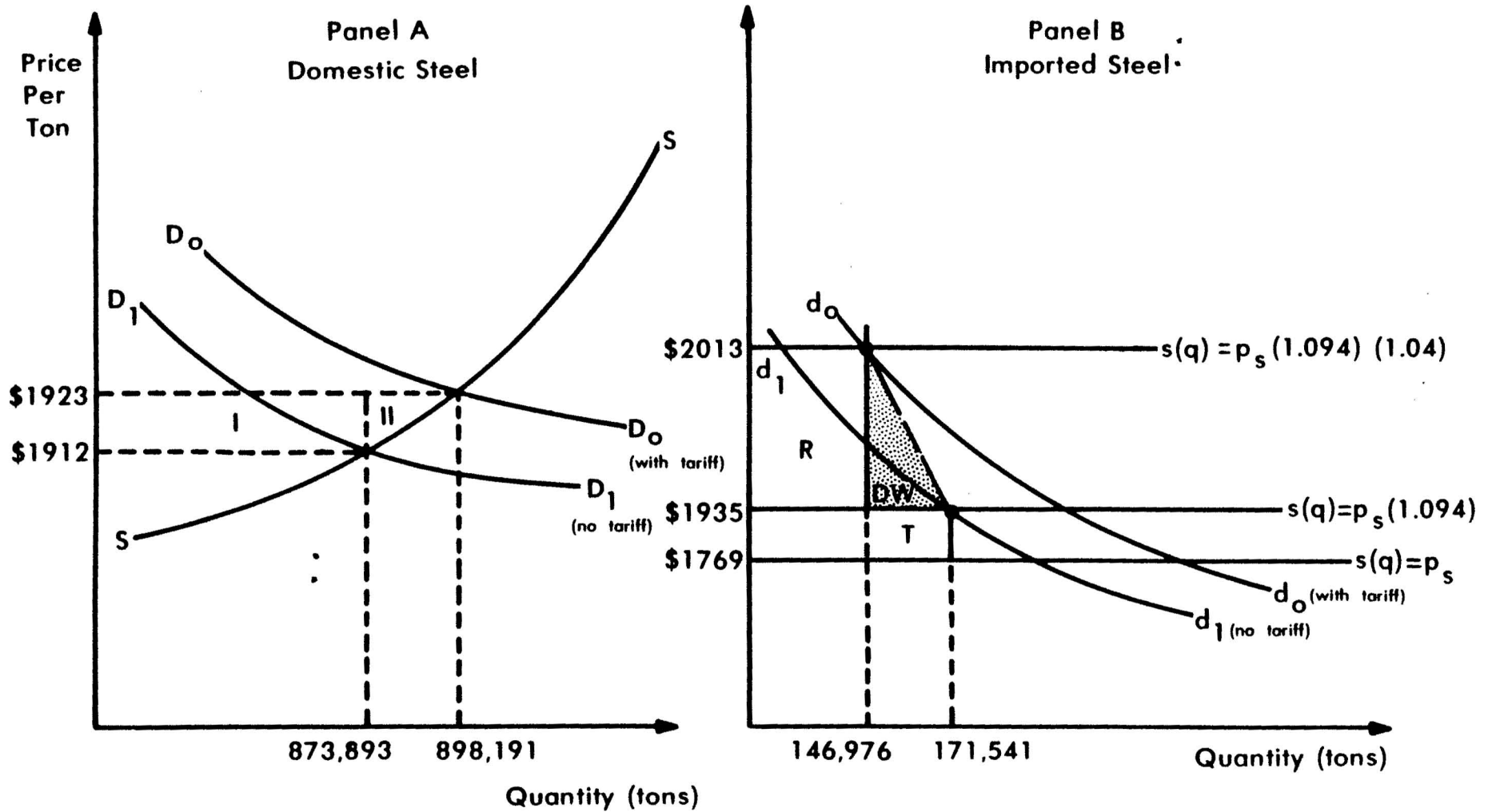
Flat Products. If the tariff surcharge is allowed to expire as scheduled, then equation 4 would no longer apply; rather equation 4\* would determine the import supply price. In particular, we have  $s(q) = p_s(1 + .094) = p_1$ . Since we have the value of  $p_0$  from the initial equilibrium, and  $p_0$  is equal to  $p_1(1 + .04)$ ,  $p_1$  is easily obtained. In particular,  $p_1 = \$1935.36$  per short ton. Substituting this value for  $p_1$  and the values for  $a^f$ ,  $b^f$  and  $c^f$  into equations 1'-3' and solving, yields the solution for the estimated new equilibrium after the removal of the tariff surcharge. These values are: ( $P_1 = \$1912.12$ ,  $Q_1 = 873,893$ ); ( $p_1 = \$1935.36$ ,  $q_1 = 171,541$ ), where the units are in short tons. The solution is depicted in figure 2.

Non-Flat Products. If the quotas on non-flat products are allowed to expire then equation 4 would no longer apply. Rather the import supply price would be determined from an equation analogous to that for the flat products. In particular, the new price for non-flat products would equal  $p_1 = p_s(1 + .056)$ .

The problem for us is to determine  $p_1$ , the price at which imports would be supplied in the absence of quotas. For this we examined the export prices of Japanese (the leading exporter to the US) bars and rods. A weighted average price of stainless, heat resisting and alloy tool steel bars and rods (f.o.b. Japan) was obtained from Japanese customs data. This weighted average was

FIGURE 2

Estimated Effect of Removing Tariffs on  
Stainless Steel Sheet, Strip and Plate.



Figures are not drawn to scale.  
Source: Author's calculations.



constructed for both Japanese shipments to the US and for Japanese shipments to everywhere except the US. The data revealed that in 1985, Japanese prices of these products to the US were 30.3 percent higher than their prices of these products to the rest of the world. It may be the case, however, that Japanese products shipped to the US are of higher quality than those shipped elsewhere. To adjust for this product differentiation possibility, we examined Japanese prices in 1982, the last full year before the quotas at issue went into effect. In 1982, Japanese prices to the US of these products were 19.7 percent higher than their prices of these products to the rest of the world. We assume that the 19.7 percent premium in 1982 reflects product quality differences that continue to prevail in 1985. Thus, if  $p_U$  is the Japanese fob price of stainless bars and rods and alloy tool steel bound for the US, and  $p_R$  is the Japanese fob price of comparable products to the rest of the world, then without a quota we would have had in 1985,  $p_U^{nq} = (1.197)p_R$  (where the superscript nq denotes no quota).<sup>13</sup>

Due to the quota, however, we observe that in 1985 we had  $p_U^q = (1.303)p_R$  (where the superscript q denotes with quota). For the product to enter the US, however, the importer must pay the import duty. Thus, exclusive of delivery charges, the initial price in the US,  $p_0$ , is equal to the price at which the product leaves Japan plus the tariff on the product, i.e.,

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<sup>13</sup> Japanese customs data are reported in Japanese yen. Thus, currency fluctuations between the yen and the dollar will not affect these calculations. The data are taken from: Japan Exports and Imports, Commodity by Country, ed. by Customs Bureau of the Japanese Ministry of Finance, Tokyo: Japan Tariff Association, December 1982 and December 1985.

The Japanese customs data that were examined for this comparison were at the 7 digit level, i.e., the most disaggregated level possible. Thus, possibilities for product upgrading within a product group are minimized.

$p_0 = (1.303)(1.056)p_s = (1.056)p_U^q$ . If the quota is removed, however, the price will be lowered to  $p_1 = (1.056)(1.197)p_s = (1.056)p_U^{nq}$ . Then  $p_1/p_0 = (1.197)/(1.303) = .919$ ; or  $p_1 = (.919)p_0$ . Thus, we take the import supply price after quota removal to be 91.9 percent of its value in the initial equilibrium, i.e.,  $p_1 = \$3018.48$ . We may substitute this value of  $p_1$  into equations 1'-3', along with the solved values of  $a^{nf}$ ,  $b^{nf}$  and  $c^{nf}$ . We have three equations in three unknowns, which when solved yields the new equilibrium of: ( $P_1 = \$3259.06$ ,  $Q_1 = 216,720$ ); and ( $p_1 = \$3018.48$ ,  $q_1 = 87,380$ ), where the units are in short tons. The solution is depicted in figure 3.

### III. THE GAINS TO CONSUMERS AND THE ECONOMY

#### FROM TARIFF AND QUOTA REMOVAL

##### Gains to Consumers and the Economy

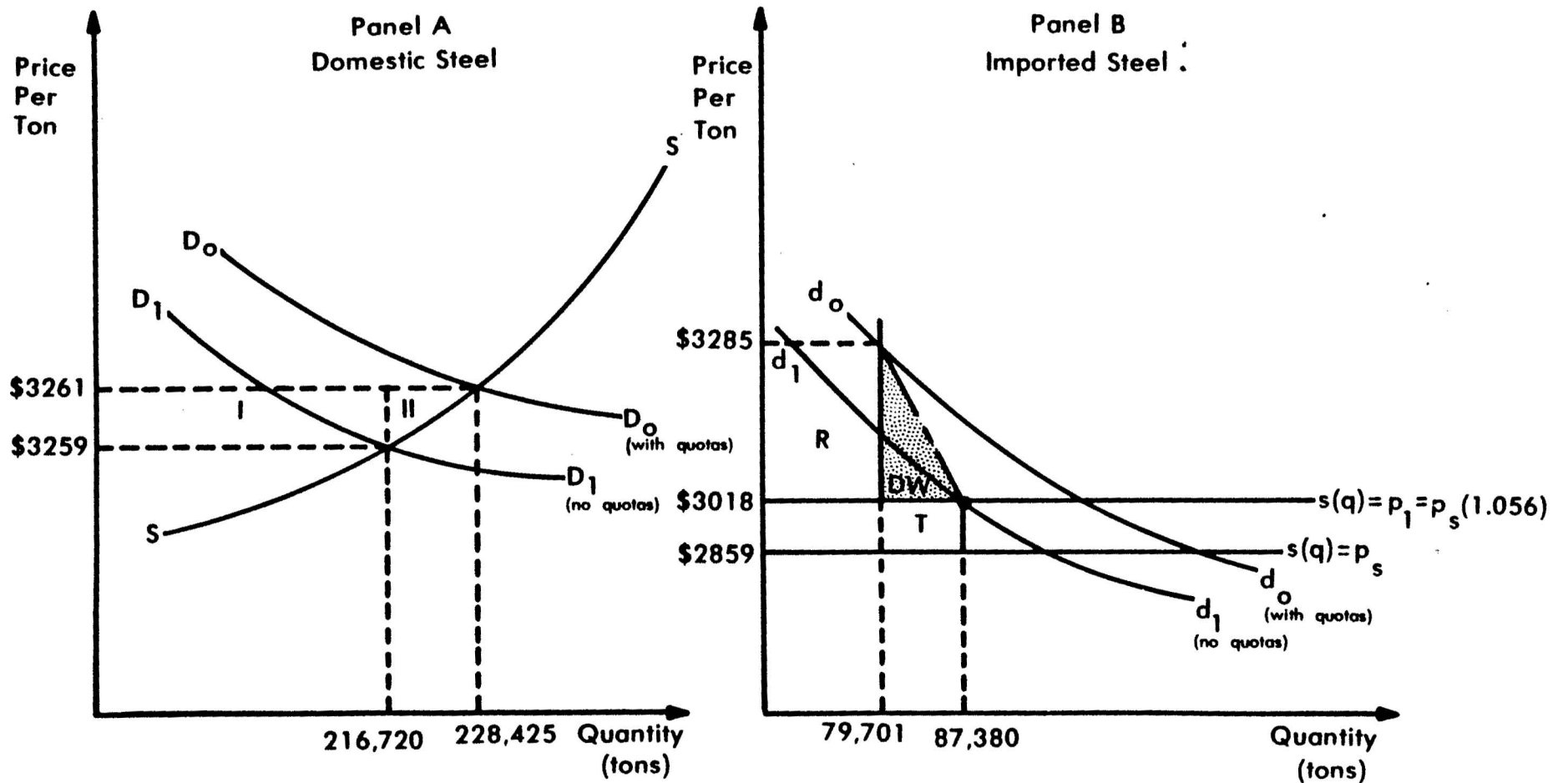
The analysis of costs to consumers and the economy begins with an estimate of the reduction in consumers' surplus as a measure of the value of consumers' losses from the imposition of the tariff.<sup>14</sup> How to estimate the change in consumers' surplus is not immediately obvious since two markets (domestic and imports), not just one, are involved and the demand curves in both markets have changed. The methodology of Burns (1973), however, applies precisely to this situation, and the Burns analysis is employed below. As a result of the quota, the lost consumers' surplus is equal to the sum of four areas: rectangle I plus triangle II in panel A, plus the rectangle R and

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<sup>14</sup>Willig (1976) has shown that this measure is a good measure of welfare changes.

FIGURE 3

Estimated Effect of Removing Quotas on  
Stainless Steel Bars and Rods and Alloy Tool Steel.



Figures are not drawn to scale.  
Source: Author's calculations.

triangle DW in panel B.

Define deadweight losses as:

$$(5) \quad DWL = \Delta CS + \Delta PS + \Delta T$$

where  $\Delta CS$  = change in consumers' surplus,  $\Delta PS$  = change in producers' surplus, and  $\Delta T$  = change in tariff revenues, and where all the  $\Delta$ s are defined as the value of the variable in the new predicted equilibrium less the value of the variable in the initial equilibrium. That is, the deadweight loss is the amount lost by consumers which is not captured or distributed to other sectors of the domestic economy. It is lost to the economy and is in that sense a "deadweight" loss imposed by the tariff or quota.

#### Flat Products

The areas I + II, bounded by the broken lines in panel A in figure 2, are equal to the gain in producers' surplus. Quantitatively, it is equal to \$9.6 million.<sup>15</sup> Producers are willing to supply at a price read off their supply curve; the price that they are able to receive has been reduced by \$10.52 per ton. This loss in producers' surplus is equal to the gain in consumers' surplus in the domestic market, so there are no deadweight losses attributed

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<sup>15</sup>We have taken a linear approximation for the supply curve in calculating the area II.

to domestic market resource shifts.<sup>16</sup>

The rectangle R in panel B is equal to the value of the tariff surcharge revenue on purchases of imports in the initial equilibrium. It is gained consumers' surplus from tariff removal, but is not a gain to the economy. The triangle DW represents recaptured deadweight loss from removal of the tariff surcharge, because it is part of consumers' surplus but is not taken from other sectors of the economy either from producers' surplus or tariff revenue. It is pure efficiency gain in that it is a gain that is not lost by anyone.

An additional area of efficiency gain from tariff removal is the area T in panel B. This area represents tariff revenue after removal of the tariff surcharge that was captured by no one in the initial equilibrium. Since there are more imports in the new equilibrium than in the initial equilibrium, the government collects tariff revenue on these additional imports at the base tariff rate of 9.4 percent. Since the rectangle T is now captured by the government but not consumers, it does not represent an additional area of consumers' surplus gain.

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<sup>16</sup>This methodology is consistent with Harberger's (1971) principles, since there is no difference between the price and the marginal costs of any producer. This is because we assume that the domestic industry is competitive both before and after the equilibrium.

We employ the same procedure in the quota problem for the non-flat sector. We may be underestimating the costs to consumers and the economy in that instance, because with import quotas in place, the domestic industry may be able to raise prices above marginal costs. That is, import quotas may facilitate the restriction of output by the domestic industry. (See Krishna, 1983 for a general discussion of the subject.) Our estimates should be considered conservative to the extent that there is a restriction of output effect resulting in prices above marginal costs.

### Non-Flat Products

The analysis for domestic non-flat products is fully analogous to the flat problem. For the import market, however, there is a significant difference. The rectangle R, in panel B of figure 3, is equal to the lost quota rents of foreigners when the quotas on non-flat products are removed. The foreigners sell their quota allotment at the weighted average price of \$3285 per ton, when the price at which they are willing to supply this quantity is read off their tariff inclusive supply curve and is \$3018 per ton. The difference in the realized price versus the price at which they are willing to supply is the quota rent per ton. In figure 2, the rectangle R represents tariff revenue captured by the government. It is because of this rectangle of quota rents (that are converted to tariff revenue for the government under a tariff) that quotas given to foreigners represent a greater cost to the domestic economy.

The triangle DW and the rectangle T also have fully analogous interpretations to the flat products case. When the quota is removed, both areas represent efficiency gains. The area T, however, is not a gain in consumers' surplus. Because of this area T, the gains to the economy, in this particular case, exceed the gains to consumers from removal of the quotas.

### The Terms of Trade Effect

Based on the data above, which are summarized in figures 2 and 3, it is possible to calculate the additional expenditures on foreign steel resulting from removal of the tariff surcharge and the temporary quotas. For flat products this amount is \$47.5 million and for non-flat products the amount is

\$1.9 million. If there were no other effects on the US balance of trade, this would be expected to slightly depreciate the value of the US dollar. A depreciated dollar, however, causes US citizens to pay more for imports and receive less for their exports (a negative terms of trade effect).

There are many ways in which lower steel prices will cause the US to import less and export more of other goods. Thus, when all the repercussions of the lower steel prices have evolved through the economy, the effect on the US balance of trade can be expected to be considerably smaller than the \$47.5 million and \$1.9 million values, and may even reverse in sign. Lacking a general equilibrium model for the calculation of these effects, however, we take the \$47.5 and \$1.9 million values as our estimate of the balance of trade effect. Thus, we will be overestimating the terms of trade effect and underestimating the gains to the economy of removal of the tariffs and quotas.

A methodology has been developed in Tarr and Morkre (1984) that indicates that for every dollar of improvement in the balance of trade, the US economy gains \$0.038. Therefore, the terms of trade loss is: \$1.8 million for tariff removal ( $= .038 * \$47.5$  million); and \$0.1 million for quota removal ( $= .038 * \$1.9$  million). These values are subtracted from the deadweight loss estimates to arrive at the net gains to the economy from tariff and quota removal.

#### Aggregate Gains

The aggregate gains to the economy from removal of the tariff surcharge on flat products and quotas on non-flat products is taken to be the sum of the separate gains.

## IV. COSTS PER JOB PROTECTED

If the tariffs and quotas are extended, then a number of jobs in steelmaking will remain protected. An estimate of the number of jobs protected can be based on the estimates of section II. Extension of the tariffs will result in an additional 24,298 tons of flat stainless steel products being produced per year in the US. Extension of the quotas will result in an additional 11,705 tons of stainless bars and rods and alloy tool steel being produced per year in the US.

From data in USITC publication 1908, it is possible to calculate employment-production ratios for the industries in the above paragraph. In particular, in 1985 it took an average of 14.90 workers to produce one thousand tons per year of the aggregate of the steel products at issue in this proceeding. Using this value as our estimate of the additional workers required to produce the additional tonnage, removal of the trade restraints at issue will result in the loss of 362 jobs in the flat products sector and 174 jobs in the non-flat products sector. We divide our estimates of costs to the economy and to consumers by these numbers of jobs to derive the costs per job estimates that are summarized in table 2 above. The costs per job estimates are presented by sector and in the aggregate; the aggregate estimates are obtained by dividing the aggregate cost estimates by 536 (= 362 + 174).

The costs per job estimate do not include the private costs of providing a job. That is, they exclude the wages and other costs of providing employment in an industry. Moreover, as we have explained in Morkre and Tarr (1980), trade restrictions cannot be expected to increase employment on an



economy-wide basis. Thus, the jobs protected in steel are likely lost elsewhere in the economy, and these estimates are to be interpreted as the costs of providing employment in steel at the expense of employment elsewhere.

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CERTIFICATE OF SERVICE

I hereby certify that on this 27<sup>th</sup> day of March 1987, I have served the foregoing prehearing brief by causing the original and 14 copies to be hand-delivered to the Secretary of the Commission and a copy to be mailed first class, postage prepaid to the following:

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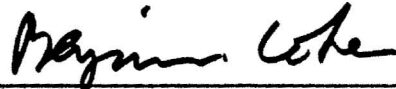
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