

Are Subsidies More Dangerous Than Dumping? Evidence from Wealth Effects for the Steel Industry

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Abstract

The GATT permits its members to protect their constituent firms from unfair trade practices, such as dumping and subsidies, on the part of foreign firms and governments. In the U.S., for example, the investigative procedures, injury standards, and remedies are the same for dumping and subsidies. International legal scholars have argued that there is no inherent reason why they have to be identical. The present paper uses an event study to determine if there is a significant difference in the reaction by the capital market to subsidy and dumping decisions for the U.S. steel industry. Because there is evidence that the reactions differ systematically in an efficient market, there is justification for permitting a weaker industry standard and stronger remedy

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for subsidy investigations.

I. Introduction

The General Agreements on Tariffs and Trade (GATT) permits its members to protect their constituent industries from unfair trade practices on the part of foreign firms and their governments. Two of the most important forms of unfair trade practice, as measured by the number of petitions filed, are dumping and subsidization.¹ In the United States, these practices are addressed by the Tariff Act of 1930, the Trade Agreements Act of 1979, and the Trade and Tariff Act of 1984. Under these Acts, the investigative procedures, injury standards, and remedies for dumping and subsidization are the same. However, Jackson [1989] has argued that "...there is no inherent reason why they need to be. The policies concerning a permitted response to dumped goods are substantially different from those concerning subsidized goods. One might easily think of a separate set of material injury rules for each of these subjects, each set being more carefully tuned to the policies of each subject." The present paper provides support for Jackson's arguments by observing the capital market reactions to dumping and subsidy decisions. Because there is evidence that these reactions differ systematically in an efficient market, there is a justification for changing the trade law to permit a different (weaker) injury standard and (stronger) remedy for affirmative subsidy determinations relative to affirmative dumping decisions.

There are reasons, however, to believe that dumping and subsidization entail significant differences, and that the injury standards and remedies should differ for these practices. For example, in an intertemporal model, a

1. U.S. trade law defines dumping as exporting to the U.S. at less than fair value. Fair value requires an estimate of foreign market value that is based upon one of the following: (a) foreign market price; (b) third country price; or (c) constructed value. When the foreign market is very small or sales are at below the cost of production, (b) or (c) are used. Constructed value is defined as manufacturing costs, plus marketing expenses of not less than 10 percent of manufacturing costs, plus profits of not less than 8 percent of manufacturing plus marketing costs. A subsidy occurs when the foreign government provides a direct or indirect payment with respect to the manufacture, production, or exportation of merchandise into the U.S.

firm may incur a first period cost through dumping to attain a second period gain.² Thus, dumping may be part of an individual firm's rational business plan and may indeed not be "unfair" in a broader context. The existence of subsidization, however, could pose a greater danger to the home industry. This is because governments have more resources than firms, and a commitment by the foreign government through a tax or expenditure policy to the same objective does represent unfair competition.³ In addition, many subsidy and dumping investigations are terminated through the negotiation of a voluntary export restraint (VER) with the foreign government. If the foreign government has been a participant in the unfair trade practice, as in the case with subsidies, the market may react with more skepticism to the VER in a subsidy case than in a dumping case. Although quantitative trade barriers have been considered to facilitate collusion between a home and a

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2. For example, Anderson [1992] argues that a firm may dump in the first period to expand exports to obtain a higher allocation under an anticipated voluntary export restraint (VER) in the second period. That is, the second period VER allocation may depend upon a firm's share of total exports in the first period. Gruenspecht [1988] devised a model of dumping with learning in which future production costs are a function of current output. Dumping, which expands current output, lowers subsequent costs. Hartigan [1990] states that a first period export subsidy can enable a firm to expand its output in the first period, and can then permit it to sustain that output in the second period when consumers have switching costs, even if the subsidy has been removed. Hartigan [1993] discloses that a foreign firm may dump to convince the home firm that it has low costs, thereby inducing the home firm to exit. Eaton and Mirman [1991] depict a home firm that dumps in the international market to convince its rival that it has low demand at home, thereby inducing its rival to contract its output in the international market because of the expectation of high exports by the home firm. Bagwell and Staiger [1989] have demonstrated that a subsidy may enable a firm to export to a market when incomplete consumer information regarding product quality is an entry barrier. Staiger and Wolak [1992] discuss dumping as a means of reducing the cost of carrying capacity in low demand states in a firm's primary market. Clarida [1993] considers dumping as a concomitant of firms entering a market prior to knowing their production cost. Dumping results until "shakeout" of inefficient firms is complete.
 3. Even though a countervailing duty may negate a particular subsidy, a foreign government that is committed to facilitating attainment of a competitive advantage will likely try another means of helping its constituent industry and thus poses a serious long-run threat.

foreign industry (see Krishna [1989]), it may be easier to collude with firms when their government has not had a prior involvement in an unfair act. Thus the capital market reactions to these decisions may differ.

The current investigative process is governed by the Trade Act of 1979. It directs the Department of Commerce (DoC) to make an existence of dumping and/or subsidization determination, and directs the U.S. International Trade Commission (USITC) to make an existence of injury determination.⁴ If both of these determinations are affirmative, the U.S. Customs Service is directed to apply an antidumping or countervailing duty in the amount calculated by the DoC as creating the unfair advantage for the foreign exporter to the U.S.

In the present paper, we ascertain that dumping and subsidization are in fact different in the danger they pose to the home industry by observing capital market reactions to dumping, subsidy, and subsidy cum dumping investigations conducted in response to petitions filed by the U.S. integrated steel industry.⁵ We chose the integrated steel industry because there were many unfair trade practices petitions filed by this industry, and the investigations encompassed essentially the same firms.⁶ By focusing on the same firms for a large number of investigations, we essentially created a laboratory through which the market reactions to these investigations could be compared.⁷ We observed that there were significantly different market reac-

4. Typically the USITC assesses the performance of an industry through such variables as profits and employment. If these data suggest that the industry is suffering or is about to suffer, the USITC then decides whether unfairly traded imports are a significant cause of this poor performance. For more on this issue, see Hartigan, Kamma, and Perry [1990].

5. An integrated steel firm makes new iron through the use of, for example, a blast furnace. Alternatively, a nonintegrated steel firm will use scrap iron in an electric furnace.

6. The steel industry accounts for roughly half of all the antidumping and countervailing duty investigations since the Trade Agreement Act of 1979.

7. The steel industry, and USITC investigations of it, has attracted the attention of international economists in the past. For example, Grossman [1986] utilized it in devising a method of injury determination. Lenway, Rehbein, and Stars [1990] examined the reactions of the wealth of integrated and nonintegrated steel firms to the Trigger Price Mechanism of 1977 and 1980, and the Voluntary Export Restraint of 1982. Herander and Pupp [1991] examined lobbying for protection by the U.S. steel industry in the 1980's.

tions to dumping and subsidy cases, suggesting that trade law should not use the same injury standards and remedies. By using the same injury standards and remedies, the law is saying that, on average, the market reactions to dumping and subsidy decisions should be the same. Using the capital market reaction as a means of assessing the value of protection has been invoked previously by Hartigan, Perry, and Kamma [1986] for escape clause cases, and Hartigan, Kamma, and Perry [1989] for nonsteel anti-dumping investigations.⁸

II. The Capital Market Event Study Method⁹

The approach taken by our study utilizes a portfolio of firms constructed for *each* decision date; the firms included are those integrated steel firms identified by the USITC investigation as producers of the pertinent product. A time series is created for each portfolio, and the significance of the abnormal return to the portfolio on the decision date is assessed. This abnormal return is an unbiased measure of the average present (discounted) value of the outcome of the investigation to the owners of the firms, *i.e.*, the stockholders.

For each firm, daily returns from the CRSP (Center for Research in Securities Prices) tape were converted to continuously compounded weekly returns, and portfolio returns were formed by averaging (equally-weighting) the returns of the individual firms. The CRSP equal-weighted index was used as a proxy for the market portfolio. Each portfolio's normal relationship with the market was modeled as

$$R_{iw} = \alpha_i + \beta_i R_{mw} + U_{iw} \quad (1)$$

where

R_{iw} is the continuously compounded rate of return for portfolio i in week w ;

8. Also, Grossman and Levinsohn [1989] used the capital market reaction to test for capital mobility in a study of trade sensitive industries.

9. For an excellent discussion of this technique and its use in the study of regulation, see Schwert [1981].

α_i is a constant;

β_i is the systematic risk for portfolio i ;

R_{mw} is the continuously compounded rate of return for the market portfolio (proxied by the return on an equally weighted portfolio of all stocks on the New York and American Stock Exchanges); and

U_{iw} is a disturbance term with the usual properties.

For each week in which a decision was made, designated as relative week number 54, this market model regression was run using weekly data for relative weeks 1 through 52. This yielded the estimates of the regression parameters, from which we calculated the abnormal portfolio return for week 54. Thus equation (1) was estimated for 52 weeks prior to each decision. Week 53 was omitted to prevent contamination of the estimates for α_i and β_i by any possible information leakage prior to the decision in week 54. The abnormal return was then calculated for week 54, which was the week of the decision. Thus, for each decision, an estimate of α_i and β_i was made. Each estimate of an abnormal return required 54 weeks of data. For those companies involved in the week 54 decision, this abnormal portfolio return represented the average firm abnormal return for week 54. Divided by the (adjusted) standard error, this return became (under the null hypothesis, with the usual regression assumptions) a variable (X_i) with a t distribution having 50 degrees of freedom.¹⁰ This method of analysis insured that the regression parameters used to derive the abnormal return and its standard error were independent of the industry portfolio return during week 54.

Each investigation analyzed consisted of many (but a nonuniform number of) different weeks. The variation in length was a result of extensions due to complexity of some of the investigations, and the suspension of some inves-

10. The weekly portfolio residuals for decision weeks were standardized using the residual variance of the market model regression. This standardization was necessary because of the potential problem of heteroskedasticity across different decision portfolios in our sample. The residual variances used in this standardization were adjusted to reflect the predictive nature of the excess returns in our decision weeks. That is, the excess returns were calculated outside the time interval used to estimate the parameters of equation (1). Since our decision weeks were always relative week 54, and our parameters were estimated for relative weeks 1 through 52, this adjustment is likely to have little effect.

tigations due to the negotiation of a voluntary export restraint. Each week's X_i was, however, independent of any other week's X_i . Thus we could average the X_i and rely on the Central Limit Theorem, using the known mean (*i.e.*, zero) and the variance of the student t distribution [*i.e.*, $k/(k-2)$, where k is the number of degrees of freedom in the market model regression] to derive a test statistic that is distributed (in the limit) as $N(0,1)$. This test statistic is reported in Table 2, which is discussed below.¹¹

III. The Unfair Trade Practices Investigation Procedure

After a petition is received in acceptable form, the investigation into the allegation of unfair trade practices consists of a set of critical decisions by the USITC and the DoC. The USITC makes a preliminary material injury determination within 45 days of the filing date.¹² If this determination is affirmative, the DoC makes a preliminary dumping and/or subsidy determination within 160 days of the filing date. Irrespective of this decision, the DoC must then make a final decision regarding dumping and/or subsidization. This must be within 235 days of the filing. If the DoC final decision is affirmative, then the USITC must make a final material injury determination. This must be within 280 days of the filing. If this decision is affirmative, the U.S. Customs Service is directed to impose an antidumping or countervailing duty in the amount calculated by the DoC in its final decision on the offending source of imports (firms and/or country). Thus *any* negative critical decision results in a negative determination for the entire investigation. An investigation may also be terminated through the negotiation of a voluntary export restraint (VER) agreement with the foreign entity. This negotiation occurs through the office of the U.S. Trade Representative (USTR).^{13,14}

11. As a practical matter, there is little difference between using critical values from an $N(0,1)$ distribution versus a $t(50)$ distribution.

12. An affirmative decision can be for injury, threat of injury, injury and threat of injury, or the material retardation of the establishment of an industry. Negative decisions are not categorized. All affirmative decisions in our sample of integrated steel firms were categorized as either injury or injury and threat of injury.

13. Note that the Trade Act of 1979 permits the suspension of a dumping investigation when the exporters of the merchandise subject to the investigation agree to revise

IV. Data

As was indicated previously, the data for the securities returns came from the CRSP tape, and integrated steel producers of each product were named in the public report by the USITC for each investigation.¹⁵ These reports also provided the DoC and USITC decision dates. In the case of a VER, the decision date came from the *Federal Register*.

The data were difficult to analyze because there were many concurrent steel investigations, and the integrated companies were party to most of these cases. Our period of analysis was for 400 weeks from April 1979 through January 1986.¹⁶ In order to analyze as "clean" a data set as possible, we initially deleted all data from weeks in which more than one type of decision (or a decision and a filing) was made, or in which both an affirmative and a negative (or split) decision of the same type were reached.¹⁷ A final step was to ensure that each week's data entered the analysis only once as a

their prices and/or limit their exports to the U.S. so that the injurious effect to the U.S. industry is eliminated. In the case of a subsidy investigation, the foreign government must agree to a cessation of the subsidy, and/or the exporters must agree to limit sales of the pertinent products in the U.S. These agreements by the foreigners are termed voluntary export restraints.

14. In our data set, if a VER agreement was reached, it was always after the DoC final decision and before the scheduled USITC final decision. Thus, the USITC final decision did not occur if the case ended with a VER agreement.
15. Ralph Thompson of the Iron and Steel Division of the DoC informed us that Armco, Bethlehem, Colorado Foundry and Iron, Inland, Jones and Laughlin, LTV, McLouth, National, Republic, U.S. Steel, and Wierton should be considered as integrated during all or part of our sample period. Please note that: CF&I was integrated until December of 1983; LTV acquired J&L in 1982 and Republic in 1984; McLouth filed for bankruptcy in December of 1981; and Wierton is a former division of National.
16. The Trade Act of 1979 transferred authority from the Department of Treasury to the DoC for the existence of dumping and/or subsidy determination. Our analysis began with the first steel case decided under this new authority. Week number one in our analysis was the week of April 3, 1978, which allowed for the prior year of data required for the estimation of equation (1).
17. For example, week #203 (the week of February 16, 1982) included both a case filing and a USITC preliminary decision; week #270 (the week of May 31, 1983) included both affirmative and split decisions for the final USITC verdict. All data from these weeks were dropped.

decision week.¹⁸ The resulting data set was analyzed as “all observations”.

As part of our study, we also analyzed different sets of subgroups of our data set. These subgroups were, of course, not independent, but were merely different ways of subdividing the “all observations” data set. In analyzing each set of subgroups, all weeks in which filings or decisions were made that affected two or more subgroups were eliminated.¹⁹ The three sets of subgroups that we analyzed were defined according to the (1) type of steel produced: basic, fabricated, and specialty;²⁰ (2) type of alleged unfair trade practice: dumping, subsidy, and dumping/subsidy; and (3) type of alleged damage: injury, threat (for our data, a null set), and injury/threat. The “/” indicates that, for example, there is both dumping and subsidization alleged.

V. Results

One particularly interesting feature of these data was that, unlike non-steel antidumping cases (see Hartigan, Kamma, and Perry [1989]) every steel petition received affirmative verdicts for the USITC preliminary, DoC preliminary, and DoC final decisions (with one exception: one case had a negative DoC final decision).²¹ Hence, these decisions cannot be regarded as “news”, because they would have been fully anticipated by any rational observer. By way of contrast, ten of the thirty-four portfolios in the data set experienced a negative final USITC decision. Thus, the final decisions (*i.e.*, the USITC affirmative final, negative final, and VER decisions) were news in the sense that they could not have been fully anticipated.

Because only the last decision in each investigation can be regarded as

18. For example, week #214 (the week of May 3, 1982) has three filings; the first involved companies 1, 2, 3, 6, 7, and 11; the second, companies 2, 7, and 11; the third, also 2, 7, and 11. When the data were analyzed, week #214 entered once, with companies 1, 2, 3, 6, 7, and 11 each represented once.

19. For example, week #350 (the week of December 10, 1984) contained only affirmative final DoC decisions and so was retained in the “all observations” data set. However, in the dumping/subsidy subset analysis, this week was eliminated because one case decided that week was a dumping case and another was a dumping/subsidy case.

20. These are not reported since there wasn't any significance.

21. There was also a decision to restore the trigger price mechanism early in our sample period. It was not significant.

conveying new information, we reconstructed our data set to retain those weeks in which a final USITC or VER decision occurred in conjunction with another decision, such as a preliminary DoC decision. This increased our sample size somewhat and permitted us to focus more clearly on the final outcomes of these petitions.

The results are reported in two tables. Because the hypothesis of the paper is that the market response to subsidy decisions differs from the market response to dumping decisions, we performed a comparison of means test for pairs of adjusted average residuals for the portfolios. The null hypothesis is that for each pair tested, there was no difference in the sample means. The results of the means comparisons are reported in Table 1. Selected comparisons were made in the "all observations" category as well as between decisions for dumping vs. subsidy cases, dumping vs. dumping/subsidy cases, and injury vs. injury/threat cases.

The second set of results appear in Table 2. These reveal the direction and magnitude of the impact of a decision on the return to a portfolio. The test for significance is, of course, a test for results that are significantly different from zero.²²

Table 1 indicates that there are no significant differences in the "all observations" data set, and that the results are generally nonsignificant for the final USITC and VER outcomes.²³ However, in the dumping vs. subsidy

22. Performing these tests required a population variance estimate. Because each data point in the sample was the weekly abnormal return for a particular week divided by its (adjusted) standard error, each data point was (under the null hypothesis, with the usual regression assumptions) a variable with a t distribution having 50 degrees of freedom. Our event study method of analysis insured that each data point was independent of all other data points. We thus assumed that the population variance was known and was $k/(k-2)$, where k is the number of degrees of freedom in the market model regression (here, 50).

23. A possible explanation for the lack of significance in Table 2 is that unionized labor, rather than the firm's owners, is capturing the gains from protection. This could occur because in a declining industry, where there is a lack of investment in plant and equipment, the demand for labor would be highly inelastic. That is, firms would not be able to substitute away from more expensive labor, and labor would have the power to expropriate gains from protection. This is only a possible explanation. We have not explored it.

Table 1
Comparison of Means^a

All Observations	
Affirmative vs. VER	.80
Negative vs. VER	1.90
Affirmative & Negative vs. VER	.46
Affirmative vs. Negative	1.24
Affirmative & VER vs. Negative	1.74
Dumping versus Subsidy Cases	
Affirmative	1.34
Negative	2.23*
VER	2.83*
Affirmative & VER	2.56*
Dumping versus Dumping/Subsidy Cases	
Affirmative	1.54
Negative	.25
VER	.57
Affirmative & VER	1.53
Injury versus Injury/Threat Cases	
Affirmative	.58
Negative	1.39
VER	2.13*
Affirmative & VER	1.97*

- a. The above table reports the results for testing the null hypothesis that, for each pair considered, there is no difference between the two sample mean standardized abnormal returns. "Affirmative" and "Negative" refer to affirmative and negative final USITC decisions, respectively. The numbers reported are the *t* statistics; an asterisk (*) notes a statistically significant difference at the 5% level.

Table 2^{a, b}
Average Adjusted Residuals

	All Observations	Dumping	Subsidy	Dumping/ Subsidy	Injury	Injury/ Threat
Final USITC Affirmative	-0.0433 -0.16 14; 52	0.384 1.06 8; 29	-0.544 -0.92 3; 11	-0.682 -1.16 3; 12	0.000784 0.0028 13; 50	-0.616 -0.6 1; 2
Final USITC Negative	0.482 1.49 10; 33	0.0900 0.23 7; 23	1.913* 2.65 2; 4	0.366 0.36 1; 6	-0.0509 -0.12 6; 21	0.953 1.62 3; 10
VER	-0.383 -1.19 10; 48	0.196 0.33 3; 8	-3.134* -3.07 1; 5	-0.215 -0.51 6; 35	0.989 1.37 2; 6	-0.726* -2.01 8; 42

a. For each cell, the data reported are: average standardized abnormal return [under the null hypothesis, with $n = 1$, this is distributed as $t(50)$]; test statistic [under the null hypothesis, with n large, this is distributed as $N(0,1)$]; number of observations, *i.e.*, weeks of data; number of firms involved.

b. An asterisk (*) denotes a statistically significant result at the 5% level.

comparison, significant (at the five percent level) differences appeared for the negative USITC decision, for the suspension of the investigation due to the negotiation of a voluntary export restraint (VER), and for the positive (trade restricting) outcome of either an affirmative USITC decision or a VER (for the last comparison, the average residuals were pooled).

Referring to Table 2, we see that the average residuals are positive for both the USITC affirmative and the VER outcomes of a dumping investigation. However, they are negative for both of these outcomes in a subsidy investigation.²⁴ Thus the protection awarded through either an affirmative USITC final decision or a VER is treated as good news by the market in a dumping investigation, but the securities market reacts negatively to a trade restraining outcome in a subsidy investigation.²⁵ This significant difference

24. Recall that the difference between affirmative dumping and subsidy decisions is not significant.

25. That the USTR would negotiate a VER that adversely affected the integrated steel

in market response suggests that an unfair trade practice perpetrated by a foreign government is viewed differently from one perpetrated by an industry acting without government involvement. As was indicated in the introduction, the greater resources and numbers of policies at a government's disposal may account for this pessimism on the part of the market. That is, if the objective of the foreign government is to aid its constituent industry in the obtaining of a competitive advantage, the market is saying that the injury standard and remedies available under U.S. trade law are significantly less effective than when the foreign industry is acting alone in dumping exports on the U.S. market to obtain that advantage. In the case of a VER, the market is saying that it is suspicious of agreements with a foreign government because of its prior perpetration of an unfair act.²⁶

The significant difference in the means when the USITC decision is negative is also of interest. The market reacts positively to both a negative dumping and a negative subsidy decision, as Table 2 reveals. However, Table 1 discloses that this reaction is significantly stronger for the subsidy decision. Understanding this result requires a knowledge of how an investigation is conducted, and what the public report discloses.

The information solicited by the USITC is for a narrow product line or subline. This is typically at the 5 to 7 digit level of disaggregation of the Tariff Schedule of the United States. The solicited information is much more detailed than that which is typically provided by the Corporate Annual or 10K reports. However, the responses to the questionnaires that the USITC sends to the producers are confidential. The public report contains industry level data (aggregated from the firm responses to the confidential question-

industry, as it apparently has for subsidy and dumping/subsidy cases, may seem surprising. However, the Trade and Tariff Act of 1984 mandates that the USTR must take into account the public interest in this negotiation. This includes the interests of consumers, consuming industries, and the United States as a whole. It is not the steel industry that does the negotiating, and the administering authority, not the industry, is the final authority on the termination of an investigation.

26. As an example, there is widespread criticism of Japan for failure to comply with agreements with the U.S. to reduce their trade imbalance. Although they may comply with the letter of the VER, it is still possible that they will subsidize the industry to realize economies of scale or adopt a new technology so that the industry will be in an even stronger competitive position when the VER expires.

naires), and a judgement by the USITC as to whether there is injury, threat of injury, injury and threat of injury, or a lack of material injury. This determination by the USITC is a signal to the market, based on a level of detailed information that the market does not have, regarding the health of the pertinent firms in the production of the goods covered by the petition. The negative injury judgement is regarded as good news, particularly in a subsidy case as compared to a dumping case. If the market is more concerned about foreign government involvement in an unfair trade practice than one perpetrated solely by the private sector, then the determination by the USITC that the domestic industry has been able to withstand this practice is reassuring to the market. This is further evidence that the market views subsidy cases as being fundamentally different from dumping cases.²⁷

When dumping investigations were compared to dumping/subsidy investigations, there was no significant difference in the means. When a foreign industry must contribute to the gaining of a competitive advantage, the market views it as less foreboding than when the government undertakes the total expense as in a pure subsidy case. Nonetheless, Table 2 reveals that the market still reacts negatively to a trade restricting outcome in dumping/subsidy investigations.

Finally, Table 1 discloses that there is a (barely) significant difference in the means when material injury was compared to injury/threat for the VER, and when material injury was compared to the VER pooled with an affirmative USITC decision. The residuals in Table 2 were positive for the injury

27. An alternative explanation for our results is that dumping is more visible to the market than subsidies. This view suggests that the outcome of the dumping investigation is fully predicted in advance of the filing of the petition, whereas, the decisions in the subsidy investigation contain an element of surprise. According to this view, there is an incomplete negative wealth effect prior to the filing when a prediction $\pi \in (0,1)$ is made regarding the existence of the subsidy cum injury. When a negative (positive) decision is made, the market interprets this as good (bad) news, and the incompleteness of information is thereby resolved, and a market correction occurs for the pertinent firms. While this visibility difference may have some validity for nonsteel petitions, we have discussed this with a steel industry expert who believes steel is a very visible and politically powerful industry, and the existence, type, and magnitude of subsidies is generally well known. Unfortunately, our data set contains too many concurrent investigations to test for the visibility hypothesis.

decisions and negative for the injury/threat decisions.²⁸ However, a perusal of our data set suggests that this may be a result of the influence of subsidy and subsidy/dumping investigations on the residuals in the injury/threat category. Dumping cases are more common in the injury category. Because injury/threat is likely to be an earlier stage of import damage than injury, the petitioning firms may be revealing that they regard subsidization as different from dumping by filing earlier. That is, they may be partially mitigating the failure of the trade law to distinguish between these unfair trade practices through the injury standard and remedy. This provides further support for our hypothesis that dumping and subsidization are fundamentally different.²⁹

VI. Conclusion

U.S. trade law does not distinguish between subsidy and dumping investigations with regard to the investigative procedure, injury standard, or remedy. By analyzing the market responses to petitions filed by the integrated steel industry, we provide a basis for the comparison of these unfair trade practices. That is, we use the same set of firms to compare the value of relief from these different practices. Although the average market reaction of a fairly small sample does not permit a precise quantification of what injury standards should be, it does provide evidence that the present system of identical standards is inappropriate. Because these firms are so frequently under investigation, we introduce a new method of constructing portfolios that permits us to analyze the results of each investigation independently. The conclusion of our study is that governments should consider regarding

28. This appears to suggest that protection is more beneficial to the integrated steel industry under injury than it is under injury/threat. This is in contrast to the results of the Hartigan, Kamma, and Perry [1989] study of nonsteel dumping investigations in which they reported that protection was more beneficial in the early stages of an unfair trade practice, *i.e.*, threat of material injury.

29. Note that in Tables 1 and 2, negative final USITC decisions are categorized by injury, threat, and injury/threat. As footnote 11 indicates, negative decisions are not categorized. What we did in the tables was to use the injury category from the preliminary USITC decisions, which was affirmative.

dumping and subsidization differently, as subsidies appear more damaging to their home producers. The implication is that the injury standard should be weaker for subsidy decisions. That is, it should be relatively easier to find injury under subsidization. Another possibility is to permit the countervailing duty to exceed the subsidy. Presently, the countervailing (antidumping) duty must equal the subsidy (dumping) margin. Finally, more administrative emphasis can be placed upon the finding of threat of material injury under subsidization.

References

- Anderson, James E. [1992], "Domino Dumping I: Competitive Exporters," *American Economic Review* 82, March; 65-83.
- Bagwell, Kyle and Robert W. Staiger [1989], "The Role of Exports Subsidies When Product Quality Is Unknown," *Journal of International Economics* 27, August; 69-89.
- Clarida, Richard H. [1993], "Entry, Dumping, and Shakeout," *American Economic Review* 83 March; 180-202.
- Eaton, Jonathan and Leonard J. Mirman [1991], "Predatory Dumping as Signal Jamming," in *Trade, Policy, and International Adjustments* ed. by Akira Takayama, Michihiro Ohyama, and Hiroshi Ohta, San Diego, Academic Press.
- Grossman, Gene M. [1986], "Imports as a Cause of Injury: The Case of the U.S. Steel Industry," *Journal of International Economics* 20, May; 201-23.
- Grossman, Gene M., and James A. Levinsohn [1989], "Import Competition and the Stock Market Return to Capital," *American Economic Review* 79, December; 1065-87.
- Gruenspecht, Howard K. [1988], "Dumping and Dynamic Competition," *Journal of International Economics* 25, November; 225-48.
- Hartigan, James C. [1990], "Export Subsidies and Switching Costs," University of Oklahoma, Department of Economics Working Paper No. 901.
- Hartigan, James C. [1993], "Dumping and Signaling," *Journal of Economic Behavior and Organization* (forthcoming).
- Hartigan, James C., Sreenivas Kamma, and Philip R. Perry [1989], "The

- Injury Determination Category and the Value of Relief from Dumping," *Review of Economics and Statistics* 71, February; 183-6.
- Hartigan, James C., Sreenivas Kamma, and Philip R. Perry [1990], "Bifurcated vs. Single Injury Determination in USITC Antidumping Investigations," *Journal of International Economic Integration* 5, Spring; 47-63.
- Hartigan, James C., Philip R. Perry, and Sreenivas Kamma [1986], "The Value of Administered Protection: A Capital Market Approach," *Review of Economics and Statistics* 69, November; 610-17.
- Herander, Mark G., and Roger L. Pupp [1991], "Firm Participation in Steel Industry Lobbying," *Economic Inquiry* 29, January; 134-47.
- Jackson, John H. [1989], *The World Trading System: Law and Policy of International Relations*, Cambridge, MIT Press.
- Krishna, Kala [1989], "Trade Restrictions as Facilitating Practices," *Journal of International Economics* 26, May; 251-70.
- Lenway, Stefanie, Kathleen Rehbein, and Laura Starks [1990], "The Impact of Protection on Firm Wealth: The Experience of the Steel Industry," *Southern Economic Journal* 56, April; 1079-93.
- Schwert, G. William [1981], "Using Financial Data to Measure Effects of Regulation," *Journal of Law and Economics* 24, April; 121-58.
- Staiger, Robert W., and Frank A. Wolak [1992], "The Effect of Domestic Antidumping Law in the Presence of Foreign Monopoly," *Journal of International Economics* 32, May; 265-87.