Steel Safeguards and the Welfare of U.S. Steel Firms and Downstream Consumers of Steel: A Shareholder Wealth Perspective

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Abstract: This paper analyzes the steel safeguards implemented and subsequently removed during 2001-2003. Our results reveal that for shareholders of U.S. steel companies, safeguards generated positive "abnormal" returns of approximately 6%; and the cancellation of the safeguards resulted in wealth gains of about 5%. Steel shareholders experienced negative abnormal returns of -5% in response to the WTO ruling that the U.S. violated WTO law. The results here are consistent with the neoclassical view that producers gain at the expense of consumers. Downstream consumers in transportation equipment and electrical equipment showed the clearest negative reaction to the safeguards. Moreover, steel firms that received larger cash disbursements under the Byrd amendment received additional wealth gains when the safeguard duties were imposed. Finally, empirical results indicate that U.S. downstream-consuming firms that diversify production in NAFTA countries avert some trade policy risk associated with the initiation of the safeguard investigation and the imposition of the safeguard duties.

1. Introduction

The U.S. steel industry has received trade protection perennially for decades with intended and unintended consequences. The *Institute of International Economics* reported that from 1964-2001, U.S. steel consumption decreased by approximately 11% while traditional steel production declined 54%.[1] At the same time, minimill steel production, which involves the recycling of steel scrap, has risen 267% and steel worker productivity has increased 136%![2] With respect to labor patterns, more than 12.8 million Americans are employed in industries which are downstream consumers of steel such as autos and appliances, yet only 170,000 workers are employed in the U.S. steel industry, a ratio of 57 to 1. With these competing outcomes and imbalances, steel firms are still the recipients of a high level of trade protection relative to other industries in the U.S.[3].

Between 1997 and 2001, 35 companies representing about one-third of all U.S. steel capacity fell into bankruptcy. In response, President George W. Bush imposed global safeguard tariffs in early 2002, but then dismantled the safeguards after only 21 months when a string of factors helped the steel industry return to profitability. These included reductions in capacity and general restructuring following a wave of bankruptcies and mergers, a healthier U.S. economy, and a depreciating dollar. Moreover, China's increasing absorption of global steel exports (which might have otherwise landed on U.S. shores) contributed to the jump in global steel prices that aided U.S. firms. The role of the safeguards, however, has been questioned by industry observers. In fact, after three decades of various forms of trade relief, no real consensus

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[1] The more traditional method of producing raw steel involves first combining coking coal, iron ore, and limestone in a blast furnace to make purified molten iron ore. The molten iron ore is then converted into molten steel by being blown with oxygen in a basic oxygen furnace. Increasingly, however, raw steel is made by minimill firms, which melt down steel scrap in electric arc furnaces. Minimills are currently responsible for about half of all domestic steel production in the US.

[2] Data obtained from the Detroit News article,"Steel Tax Huts Automakers Consumers and Workers", Sunday, July 20, 2003.

[3] Data obtained from the Consuming Industries Trade Action Coalition (CITAC), www.steeltradefacts.info (cite expired, paper copy available upon request).

has emerged as to how helpful these protectionist policies have actually been to the steel industry.

Neoclassical trade theory suggests that trade protection, in the form of tariffs, improves the welfare of the protected industry at the expense of consumers (Lenway et al., 1990; Hughes et al., 1997). Along these lines, we test whether or not the effects of the steel safeguards were consistent with the implications of the neoclassical model. Specifically, we investigate the effectiveness of the recent safeguards by observing the behavior of the shareholders of U.S. steel firms and the U.S. downstream consumers of steel. Our assumption is that if the safeguards were perceived as beneficial by the owners of U.S. steel companies, then the share returns of such firms should have responded positively to announcements regarding the implementation of protection. Some firms had already begun to enjoy a boost in revenue generated by the controversial U.S. Continued Dumping and Subsidy Offset Act of 2000 (CDSOA), informally known as the "Byrd Amendment". The CDSOA directs U.S. Customs to disburse antidumping and countervailing duties back to firms that had supported the original petitions.[4] The implementation of the safeguards would presumably provide further benefit to steel firms and their shareholders. Conversely, we would expect that news signaling the demise of the safeguards, such as the WTO ruling that the safeguards violated international trade law, would push share returns down. Finally, if protectionist policies like the safeguards were viewed as ultimately ineffective in raising profitability, then policy-related announcements might have no impact on share returns whatsoever.

We also examine how the downstream consumers of steel, such as automobile and appliance firms, reacted to the implementation of the safeguards. Trade protection implies higher input prices for downstream consumers, which could potentially depress profits and correspondingly, share returns. But the impact of protection on the share returns of downstream

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[4] The Center for Trade Policy Studies reported that disbursements were approximately $231 million in fiscal year 2001 and $330 million in 2002. Furthermore, there were 894 separate claims under the CDSOA seeking $1.2 trillion, where 541 claims were successful leading to an average claim of $427,000.

industries has not been well explored in the literature. An exception is Hughes et al. (1997)

which studies the effect of protection in the semiconductor industry on the shares of downstream

consumers, such as computer and electronics firms. However, steel and semiconductors (and

their respective downstream industries) are at quite different stages in their product evolution,

and findings from Hughes, et al. (1997) might not hold for commodities such as steel and autos.[5]

The neoclassical view of international trade would suggest that trade barriers shift

economic welfare away from downstream-consuming industries towards protected upstream

producers. Consistent with this hypothesis, our empirical results indicate that the market value of

steel-consuming firms was negatively impacted by the steel safeguards. Specifically, we find

that the downstream consumers of steel experienced statistically significant negative abnormal

returns in response to the initiation of the safeguard investigation and the affirmative injury

decision by the United States International Trade Commission (USITC). Moreover, industry-

specific analysis reveals that downstream consumers in transportation equipment, construction,

and electrical equipment industries showed the largest negative reaction to the threat of steel

safeguards.

A novel feature of this study is that we test whether downstream consumers with affiliate

production facilities in NAFTA countries respond differently to upstream trade protection. More

broadly, we seek to determine whether production diversification (especially in neighboring

countries) reduces the risk of upstream protectionism in the home country. While we are not

aware of other papers that have tested this relationship, we suspected that steel-consuming firms

with facilities in Canada and Mexico might be more immune to the threat of higher steel costs in

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[5] Hughes et al. (1997) suggest if there if there are dynamic economies of scale between upstream and downstream
producers, then trade protection that aids the operations of the upstream industry (i.e. semiconductors) may actually
result in improved operations and profitability for downstream consuming firms (i.e. computers). The authors find
evidence of this (perceived) spillover effect, wherein protection in the semiconductor industry resulted in rising
computer share returns, despite the fact that higher semiconductor prices from trade protection increase input costs
for these same computer companies. It seems likely, however, that even if protection actually improved steel
industry operations, downstream consuming industries such as automobiles would not experience associated
improvements in their operations.

the U.S., since production could be shifted to neighboring facilities that have lower steel costs.[6]

Thus, firms could continue to satisfy U.S. demand for downstream products but avoid higher

costs by producing outside of the protected U.S. steel market. Our results support this

hypothesis, in that downstream consumer firms with facilities in Mexico and/or Canada

responded more favorably to the implementation of the safeguards in comparison to other steel-

consuming firms.

With regard to the steel firms themselves, our empirical results indicate that shareholders

did in fact respond positively to the imposition of the safeguards.[7] We also find that steel

shareholder wealth declined following the WTO panel ruling against the safeguards, indicating

that WTO decisions are taken seriously by investors. To our knowledge, this is the first event

study to examine shareholder behavior following a WTO ruling. The issue of how the public

responds to WTO decision-making is a potentially rich area of study, stemming in part from the

tension that arises out of the organization's power to sanction retaliation but not directly

intervene into the legal systems of its member countries.[8] Our results suggest that shareholders

are uncomfortable with protection that violates international trade law, either because it is more

likely to be cancelled prematurely, or because its continuation will lead to foreign retaliation and

associated resentment from targeted U.S. industries and the general public.

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[6] We thank the editor for suggesting the inclusion of this variable.

[7] Interestingly, while integrated steel firms fared especially well following the announcement of the safeguard investigation, shares performed worse for the actual implementation of the tariffs. This unexpected latter result may be due to the fact the tariffs were capped at 30% rather than 40%. While integrated steel firms have always been the staunchest lobbyers for trade relief in the past, the recent safeguard petition carried strong support from some minimills. This is in clear contrast to the Voluntary Export Restraint (VER) quotas of the 1980s, when Nucor, the largest minimill, was actually a vocal opponent of protection. Thus, our paper is the first event study of the steel industry in its newly united state.

[8] The ability of the WTO to enforce its directives is a constantly evolving matter, and can vary across countries as well as across issues within countries. For example, smaller countries that are more dependent on exports are more likely to abide by WTO rulings. Other nations, however, may decide which rulings are worthy of following, and which they would rather ignore. The WTO law on safeguards was recently augmented to curb or replace the use of policies for which GATT consistent rules were not full established. The WTO announced on July 11, 2003 that the U.S. failed to show an unforeseen surge in imports or "significant impairment to the domestic industry". Hence, we evaluate whether or not shareholders experienced wealth losses with respect to the WTO ruling, which served as signal that the safeguards might be terminated ahead of schedule in order to comply with international trade law.

We find evidence that steel firms responded positively to the early termination of the safeguard duties. This may be because investors had become thoroughly convinced that the industry could prosper without the support of the safeguards. Another possibility is that shareholders were not actually reacting to the removal of duties, but instead, responding to the announcement of industry restructuring. We also find that firms receiving larger Byrd-disbursements reacted negatively to the removal of the tariffs.[9] It seems that, unlike most of the steel industry, which was apparently focused on the prospect of renewed prosperity, these perennial recipients of trade relief were more concerned with losing an additional layer of protection.

2. Previous Literature

Event study methodology has been used in several studies to investigate the impact of trade protection. The theory of efficient capital markets suggests that announcements of changes (or potential changes) in trade policy will immediately affect the share returns of associated firms. Such studies test whether shares of such firms have experienced "abnormal returns" compared to a broad index of stocks during the period in which policy changes are publicized.

While the event study literature is fairly vast, there are a select number of significant papers that are closely linked to the topic of trade protection and shareholder wealth (Hartigan et al., 1986; Hartigan et al., 1989; Hughes et al., 1997; Lenway et al., 1996). Hartigan et al. (1986) analyzes the impact of "Escape Clause Petitions" (also known as safeguards) on the share returns of petitioning industries.[10] The two principle decision makers in Escape Clause petitions are the USITC, which generates a policy recommendation after a lengthy analysis of the case, and the

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[9] To our knowledge, this it the first paper to study shareholder reaction to the Byrd Amendment.

[10] Safeguard legislation is codified in section 201 of the Trade Act of 1974. Petitioning industries must prove that they have been "seriously injured" by foreign competition. Unlike antidumping and countervailing duties, safeguards are not based on allegations of "unfair trade." Thus, trade barriers stemming from a 201 case allow only a temporary "escape" from the normal trade agreements binding WTO member countries. Antidumping and countervailing duties, which protect domestic firms from unfair pricing and subsidization of foreign firms, can remain in place for decades. See Hartigan et al. (1989) for an event study of market reactions to non-steel US antidumping petitions in the early 1980s.

President, who ultimately decides whether or not to implement the safeguards. Surprisingly, Hartigan et al. (1986) reveal that shareholders had very little reaction to decisions made by either the USITC or the President, suggesting that shareholders of the petitioning firms did not actually believe that the safeguards would alter future profits to any significant degree.

Hughes et al. (1997) examine the effects of U.S. trade policy governing semiconductors using the stock returns of both the semi-conductor producers and the downstream consumers, such as computer and electronics firms.[11] The alternative hypothesis regarding semiconductor stock returns is that, consistent with the neoclassical view, any announcement suggesting or confirming protection will generate positive abnormal returns. However, a more subtle issue is how the shareholders of semiconductor consumers will respond. News of protection may lead to negative abnormal returns since higher semiconductor prices lead to higher input costs for downstream consumers, and correspondingly slimmer profit margins. A competing hypothesis is that due to dynamic economies of scale linking semiconductor producers and consumers, trade relief for semiconductor firms might ultimately benefit downstream users, and therefore be viewed favorably by their shareholders. Interestingly, Hughes et al. (1997) find evidence of the latter hypothesis, as both semiconductor consumer and producer stocks experienced positive abnormal returns following announcements of protection.

Feinberg and Kaplan (1993) investigate the dynamics of upstream and downstream antidumping filings in the metal and chemical industries. The authors find evidence that antidumping protection that applied to upstream producers had a tendency to result in the filing of antidumping petitions by downstream firms. This is primarily due to the fact that duties on upscale products raise costs and cause financial injury to the downstream industry. If this

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[11] Mahdavi and Bhagwati (1994) also use event study methodology to analyze the consequences of trade protection in the U.S. semiconductor industry. They find that shareholders reacted negatively to AD investigations and positively to the Semiconductor Agreement of 1986.

financial injury can be blamed on import competition, then the likelihood of a successful

antidumping petition by the downstream industry increases.[12]

Hartigan et al. (1994) use event study methodology to compare the impact of

antidumping and countervailing decisions on the U.S. steel industry, and find that unlike

affirmative dumping determinations (which are viewed positively), steel shareholders responded

negatively to affirmative countervailing decisions. According to the authors, this is because

investors had little faith that countervailing duties can overcome the subsidization provided by

foreign governments with potentially immense resources earmarked for favored industries.[13]

The negative reaction to countervailing duty cases may also indicate that that subsidization is

more damaging than dumping, despite the fact that U.S. trade law fails to distinguish between the

two with regard to injury standard or remedy. The authors suggest that trade policy be altered so

that countervailing duty cases involve a lower injury standard and/or produce more severe

duties.[14]

Rehbein and Starks (1995) perform an event study investigating the impact of U.S. trade

protection on Japanese steel firms. The negative returns experienced by Japanese steel

companies suggest that foreign firms do not capture a share of the economic rents generated by

protectionist policies, although wealth effects vary depending on the particular form of

protection and the individual firm.[15]

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[12] The authors also suggest that upstream producers may actually encourage filings by downstream consumers. A feedback mechanism is discussed, in which duties on the upstream industry raise input costs for the downstream industry, causing a potential decline in downstream output, which in turn reduces the demand for the upstream product. This contraction in the downstream industry therefore dampens the positive effects of the duties received by the upstream industry. For this reason, upstream producers have an incentive to encourage downstream consumers to pursue their own dumping protection, in order to offset the negative demand shock caused by duties on the upstream good.

[13] However, Blonigen and Wilson (2005) show that the actual level of subsidization is relatively small, affecting 13% or less of all steel imports. This translates into about 2.6% of the total US steel market, with an average trade-weighted CVD of 0.84%

[14] The countervailing ad valorem duty is equal to the calculated subsidy margin, just as the antidumping duty margin is equal to the calculated "less-than-fair-value" margin. Hartigan et al. suggest that countervailing duties could exceed calculated subsidy margins in order to account for the increased threat posed by foreign subsidization.

[15] For example, changes in the Trigger Price Mechanism, a price control policy used from 1977-1982, had no discernable wealth effect on Japanese steel firms. Quantitative restrictions, in the form of voluntary export restraints

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Lenway et al. (1996) take a broad look at the effects of trade protection for the U.S. steel industry. They investigate protectionist policies during 1977-1988, shedding light on the characteristics of firms that lobby for, and are rewarded with protection. Specifically, Lenway et al. (1996) contrast shareholder behavior of lobbyers and non-lobbyers for price floors established in 1977 and 1980, and quotas implemented in 1982 and 1984.[16] Results show that the shareholders of the lobbying firms experienced positive abnormal returns on all occasions but the 1980 price floor. The shares of non-lobbying firms failed to rise after the 1982 quota announcement, and rose significantly less than shares of lobbying firms after the 1984 quota announcement. Finally, steel firms which spent less on R&D reacted more positively to protection, regardless of lobbying status.[17]

3. Safeguard Investigations

3.1. Overview of U.S. Safeguard Investigations

The USITC handles global safeguard investigations codified under section 201 of the Trade Act of 1974.[18] The USITC will commence an investigation upon receipt of a petition from a trade association, firm, labor union, or by request of the President.[19] The USITC determines whether a product is being imported "in such increased quantities as to be a substantial cause of

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(VERs), negatively impacted small Japanese firms in 1982 and again in 1984 (when the policy was expanded), while share returns of large firms experienced negative abnormal returns only in response to the 1984 VER.

[16] From 1977-1982, price floors were used in the form of the "Trigger Price Mechanism", which required import prices to remain at par or above those offered by low-cost producer Japan. The penalty for undercutting Japanese import prices was to automatically face antidumping duties. From 1982-1984, a voluntary export restraint (VER) against EC steel exporters was used. Comprehensive VERs with all major foreign competitors except Canada was imposed between 1984 and 1992.

[17] Herrander and Pupp (1991) also study lobbying in the steel industry. Their results indicate that that the cost of pursuing protection and the distribution of rewards serve as better determinants of firm participation compared to variables measuring the industry's economic health. Furthermore, while free riding dampens participation, it is less severe in segments of the steel industry that have trade associations which help police member-firms, and/or where benefits from protection are concentrated among only a few firms.

[18] While the escape clause first appeared in the Reciprocal Trade Agreement with Mexico in 1943, it became codified as section 201 of the Trade Act of 1974. It has been amended several times since then, including its most recent formulation as the WTO Agreement for Safeguards.

[19] Petitions may also be submitted by the House Committee on Ways and Means or the Senate Committee on Finance, or the USITC's own motion.

serious injury, or threat thereof…" to the competing U.S. industry.[20] The USITC must make its

injury findings within 120 days (or 150 days in more complicated cases), and transmit its report

to the President, including any relief recommendations, within 180 days after receiving the

petition. If the USITC makes an affirmative determination, it recommends to the President a

form of relief that would prevent or remedy the injury and facilitate industry adjustment to

import competition. The President makes the final determination on whether to provide relief, as

well as the type and duration of protection. Relief may be in the form of duties, quantitative

restrictions, or orderly marketing agreements. If safeguard protection is implemented, reports on

the developments within the industry must be provided during the period of relief. At the

conclusion of the relief period, the USITC provides the requisite report to the President and

Congress on the effectiveness of the safeguards in helping the domestic industry adjust to

competition from imports.[21]

3.2. WTO and Safeguards

      The World Trade Organization (WTO), which was established in 1995 following the

Uruguay Round of the GATT (1986-1994), contains legislation regarding the use of safeguards

by member countries. Article XIX of the Agreement on Safeguards (SGA) permits a GATT

member to take "safeguard" action to protect a specific industry from an unforeseen increase in

imports that are causing, or likely to cause, serious injury to the domestic industry. The WTO

defines safeguards as "emergency" actions with respect to the unanticipated upsurge in imports,

while "serious injury" is defined as "significant impairment in the position of the domestic

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[20] See http://www.usitc.gov. "Serious injury" is defined as "significant overall impairment in the position of the domestic industry," which could be evidenced by under-capacity, un-profitability, and underemployment in the industry. A "substantial cause" is defined as "a cause which is important and not less than any other cause." Irwin (2003) provides a detailed analysis of safeguard legislation in the US and the WTO. Durling and McCullough (2005) examine the ITC injury-determination process, revealing the Commission's tendency to avoid more rigorous econometric techniques when seeking to determine whether imports have caused injury to petitioning U.S. industries. The authors discuss the protectionist backlash that ensued when the ITC chose to employ a more flexible econometric methodology (i.e. two-stage least squares) in a cold-rolled steel case in 2000 that resulted in a negative determination.

[21] Information obtained from http://www.usitc.gov.

industry."[22],[23] The maximum duration of a safeguard measure is generally four years, although the SGA permits extensions if further time is needed for the domestic industry to adjust to import competition.[24]

3.3 Steel Safeguards Imposed by President George W. Bush

On June 22, 2001, President Bush initiated a safeguard investigation to determine if steel imports had caused serious injury to the U.S. industry. On October 22, 2001, the USITC ruled affirmatively on 16 of the 33 disaggregated steel products under consideration, recommending restrictions ranging from quotas to 40% tariffs. The President then had the option to adopt the USITC recommendation, modify it, replace it with another form of relief, or instead take no action at all. His final decision was to apply temporary safeguards on 14 steel products, with duties ranging from 8% to 30%.[25] However, some key import sources were exempted, including NAFTA partners Canada and Mexico, as well as, low-level shipments from developing countries that belonged to the WTO.[26] The tariffs were to remain for the next three years.

After the safeguards were imposed, a WTO case was brought by the European Union (E.U.) and seven other nations.[27] The countries reported that the 201 steel tariffs violated the rules established in the WTO's Agreement on Safeguards. Under Article XIX, a GATT member may only impose tariffs if there is an unanticipated increase in imports which causes serious

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[22] To assess injury the following relevant factors must be evaluated according to SGA: the absolute and relative rate and amount of increase in imports, the market share taken by the increased imports, the changes in the level of sales, production productivity, capacity utilization, profits/losses, and employment of the domestic industry

[23] The SGA was intended to help curtail or replace the use of policies for which GATT-consistent rules had not been fully established, such as bilateral voluntary export restraints and orderly marketing agreements. The SGA dictates that the safeguards must be "temporary", and applied on a most-favored national basis (this last tenet was violated by the U.S. when it exempted NAFTA members from the safeguards.) In addition, the safeguards must be progressively liberalized while in effect and that the GATT member imposing them must pay compensation to member countries affected by the measures.

[24] Information obtained from http://www.wto.org.

[25] As recorded in the *Federal Register* (March 20, 2002, volume 67, number 54) on March 5, 2002, President George W. Bush signed Presidential Proclamation 7529 which established a remedy to "facilitate positive adjustment to competition from imports of certain steel products". Tariffs were 30% for high-volume flat bar and tin mill products for the first year, 24% for the second year, and 18% for the third year. For semi-finished steel slabs, a quota of 5.4 million tons without tariffs was imposed. For rebar welded tubular steel, stainless rod and stainless bar, the tariff was 15% for the first year and declining 3% per year thereafter. For stainless steel wire the tariff was 8%, declining by 1% per year for the two remaining years.

[26] Exemptions for developing countries were required under the SGA.

[27] These included Brazil, China, Japan, South Korea, New Zealand, Norway, and Switzerland.

injury to the domestic industry. The complaint, however, stated that there was no overall increase in imports - a necessary and sufficient condition for safeguard action.[28]

On July 11, 2003, the WTO ruled that the safeguard duties were not compliant with WTO rules. The U.S. had failed to provide evidence of an increase in imports, and also had not adequately established a link between imports and injury to the U.S. steel industry.[29] Further, the USITC investigation included imports from NAFTA partners in its data analysis when Canada and Mexico were ultimately exempt from the safeguards.

On December 3, 2003, the President announced his decision to terminate the temporary safeguard measures that had been in place for only 21 months. The administration asserted that the decision to remove the tariffs was *not* based on the threat of retaliation against U.S. imports, but instead due to the fact that steel prices had stabilized, imports had fallen and exports had reached record levels. Moreover, U.S. steel firms had restructured and cut inefficient capacity, reduced production costs, and increased productivity. It was also noted that some firms had merged during the safeguard period, leading to further efficiency gains.

4. Methodology and Data

We focus on five stages of the safeguard investigation: 1) the initiation of the safeguard investigation, 2) the final USTIC affirmative decision, 3) the imposition of the steel safeguards, 4) the WTO ruling that the U.S. violated WTO rules, and 5) the removal of the steel safeguards. Table 1 outlines the event descriptions and the dates of our focus events. In the second-stage, we examine the explanatory variables, which may influence the "cumulative" abnormal returns estimated in the first stage of this event study.

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[28]Yasukazu Morooka, president of Sumitomo Metal USA Corporation, reported that "There is no question that the foundation for President Bush's decision, the injury determination by the USITC, doesn't even meet the requirements of the US law…imports must be increasing to cause injury. Last year imports were down by 21 percent and finished steel imports were the lowest since 1996." Metal Center News, May 2002, Vol. 42, Issue 6, pg. 32.
[29] Problems often stem from the difficulty in proving causality between industry decline and import growth, when several other factors may also be to blame, such as negative demand shocks or competition from domestic producers. In fact, four of the six US cases implemented since 1995 were challenged by WTO panels, primarily because of the USITC's failure to quantify or otherwise account for other sources of injury.[29] Irwin (2003) investigates this issue and presents a more analytical framework for measuring various sources that could be incorporated by the USITC.

4.1. First-Stage Estimation of Abnormal Returns

We use event study methodology that estimates the abnormal returns for U.S. steel firms and the U.S. downstream consumers of steel. In the traditional event study methodology, estimation of the abnormal returns from an announced event is obtained in a two-step procedure. However, an equivalent one-step dummy variable technique has been used to estimate abnormal returns, which we employ here (Lenway et al., 1990; Hughes, 1997; Karafiath, 1988; Cornett and Tehranian, 1990). We estimate the following market model:

Equation 1

$$R_{it} = \alpha_i + \beta_i R_{mt} + \sum_{\tau=\eta}^{N} AR_{ij\tau} D_{i\tau} + e_{it}$$

where,

R_{it} = the return on security i on day t

α_i = the intercept

β_i = the estimate of the slope or measure of systematic risk

R_{mt} = the market return on day t, the broad-based stock index for the market portfolio, the CRSP-weighted index

$D_{i\tau}$ = a dummy variable equal to one for each day during the event window and equal to zero otherwise.

$AR_{ij\tau}$ = estimated coefficient on dummy variable, $D_{i\tau}$, or the abnormal return on security i, for event j

τ = abnormal returns are indexed in event time using τ

e_{it} = a random error term with expected value of zero

The estimation window is comprised of daily returns 120 days before the event through 20 days before the event, a 100-day estimation window. For each observation in the event

window there is one dummy variable that has a value of one, and zero otherwise. In Equation (1), the first day of the event window is denoted "η", and "N" is the last day in the event window. Hence, for T observations in the estimation window, Equation (1) is estimated over $T + N$ observations in the estimation and event windows (Karafiath, 1988). $AR_{ij\tau}$ represents the abnormal returns, which is the change in the firm's current and future expected profitability due to the announced event. The abnormal returns are in effect aggregated to provide the cumulative abnormal returns (CARs) over the event windows given by

$$CAR = \sum_{\tau = \eta}^{N} AR_{ij\tau}$$

.

Equation (1) is estimated by the SUR (seemingly-unrelated regression) method.[30] Tables 2 and 5 report CARs for the five events for steel producers and the downstream consumers of steel.

We estimate CARs for three event windows. The first two event windows capture the anticipatory nature of some trade policy announcements. The (-10, +1) window includes two weeks before the event, the event day, and the day after the event. The (-5, +1) window includes one week before the event, the event day, and the day after the event. We also include a three day event window, (-1, +1), which includes the day before the event, the event day, and the day after the event window.

4.1.2 Hypotheses

The hypotheses are based on the intended consequences of trade protection in the form of safeguards. U.S. steel shareholders are expected to gain positive abnormal returns from the first

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[30] For a sample of *K* firms, a system of *K* equations is estimated using the SUR method. Each equation in the system is represented by Equation (1). SUR addresses the problem of "event clustering" that potentially occurs in the conventional method (Karafiath, 1988). MacKinlay (1997) notes that in the conventional method, it is assumed that no event clustering exists. Specifically, there is not any overlap in the event windows of the included securities. The absence of any overlap implies that the abnormal returns and the cumulative abnormal returns will be independent across securities. On the other hand, the SUR method calculates the cross-sectional, contemporaneous covariance between the error terms; hence these covariances are properly incorporated into tests for statistical significance. (Karafiath, 1988). Karafiath (1988) also notes that in many instances the dummy variable approach yields similar results as the conventional method.

three events: the initiation of the safeguard investigation, the USITC's final affirmative decision of injury, and the imposition of the safeguards. U.S. steel shareholders are expected to receive negative abnormal returns from the WTO ruling that the U.S. violated WTO law and from the removal of steel safeguards. In some cases, firms may restructure and observe efficiency gains before the safeguards are to expire. If firms observe performance improvements during a monitoring review by the USITC, the President may order the removal of safeguards. In this instance, the firm would be expected to observe positive abnormal returns.

One of the benefits of using the SUR method is that it allows joint hypotheses testing of the economic impact of the safeguard policy on U.S. steel firms (Cornett and Tehranian, 1990; Karafiath, 1988). We test the hypothesis that the abnormal returns are jointly equal (but not necessarily zero) across the sample of steel firms. More specifically, we test whether the economic impact of the safeguard policy is the same for each steel firm. It may be the case that the steel safeguards benefited some firms more than others. Table 2 contains the F-test that the CARs are equal across all stocks for the five focus events.

Downstream consumers of steel are expected to be negatively affected by the imposition of the steel safeguards. Safeguards, a form of trade protection, may increase the price of steel, and hence the production costs of downstream consumers. Downstream consumers are expected to have negative abnormal returns from the initiation of the safeguard investigation, the USITC's final affirmative decision of injury, and the imposition of the safeguards. Finally, since the WTO's ruling regarding the illegality of the safeguards may be interpreted as a precursor to the removal of the steel safeguards, downstream consumers are expected to observe positive abnormal returns for both this event and the actual cancellation of the safeguards.

4.2 Data

The sample consists of all the publicly-traded U.S. steel firms including multinational corporations totaling 36 firms. Approximately 47% of the steel firms are integrated producers,

leaving the remaining 53% as either minimills or steel processing firms.[31] Approximately 14%

of the steel companies are multinational corporations which are also classified as domestic firms.

There are 873 downstream consumers in the following industries (number of firms in

parentheses): transportation equipment (99 firms), electrical equipment (191 firms), machinery

(256 firms), instruments (190 firms), construction (25 firms), furniture (14 firms), primary metals

(12 firms), and fabricated metals (74 firms). The firms' stock returns and market return data were

obtained from the Center for Research on Stock Prices (CRSP). Table 1 lists our five focus

events, which were obtained from the *Federal Register*, the *Wall Street Journal*, and verified in

other prominent media outlets to verify the event dates. We control for possible information

leakages with anticipatory event windows in the first-stage estimation.

4.3 Second-stage Analysis: Explaining the variation in CAR's

In the second-stage we analyze the factors that may determine the magnitude of the

CAR's for our five events. We estimate the steel specification below in Equation (2) by OLS

with White-corrected standard errors to adjust for heteroskedasticity. [32]:

Equation 2

$$CAR_{ij} = \theta + \Sigma' X_{ij} + E_{ij}$$

where θ is the intercept, X_{ij} is a matrix of explanatory variables, Σ is a vector of estimated

parameters, and E_{ij} is a normally-distributed error term.[33]

We include firm-specific explanatory variables to explain the variation in the cumulative

abnormal returns. We include a dummy variable, Type, which takes the value of "1" if the firm is

an integrated producer and "0" for minimills or steel processing firm (nonintegrated producers).

The critical differences between integrated producers and minimills is that the former makes raw

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[31] Steel processors generally buy steel and re-roll it into more refined steel products.
[32] See STATA for fixed-effect specification.
[33] We also ran the specification by generalized least squares but there were no significant differences across
estimates, and hence report the White-corrected specifications for tractability in estimation.

steel primarily by combining iron ore and coal in blast furnaces and basic oxygen/open hearth furnaces. Minimills produce steel by recycling scrap steel in electric arc furnaces, which have a much lower minimum efficient scale of operation than integrated technology.[34] Also, minimills are less likely to face unionized workers and excessive retirement costs. The expected sign for this variable is ambiguous, since both minimills and integrated firms have fallen into bankruptcies in the previous four years and both had supported the safeguards.

We also include a dummy variable equal to "1" if the U.S. steel firm is a multinational firm. To assess the benefits of protection, we want to quantify the benefits of protection to parent firms who are not U.S. domestic firms. The expected sign of the multinational variable is ambiguous, since protection shields U.S. affiliate operations but may also burden foreign affiliates with safeguard tariffs on their exports to the U.S. We also include a measure of the firm's U.S. market share. Positive abnormal gains are expected to be higher for firms with a greater market share since larger firms are more likely to have excess capacity relative to firms with smaller market share. Hence, larger firms have more elastic supply curves and are therefore more able to increase production in response to import remedies and reduced steel imports (Lenway et al., 1990). A competing hypothesis is that higher market share indicates greater vulnerability, especially in a declining industry.[35] Thus, the overall need for protection may reflect more negatively on firms with greater market share.

We also include two performance variables, financial leverage and income growth. A primary justification for the safeguards was to allow injured domestic firms to rationalize operations and increase profitability. Hence, injured (unprofitable) firms should observe positive abnormal gains. To control for profitability, we include the percentage change in the net income

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[34] Integrated firms make the majority of carbon steel "flat products", including carbon hot-rolled, cold-rolled, and galvanized sheet. Minimills dominate the production of carbon "long products", including structural shapes, reinforcing bar, hot-rolled bar, and cold-formed bar. Minimills also make most stainless steel products. In the last 15 years, Nucor, the largest minimill in the U.S., has produced increasing quantities of hot-rolled strip. Thus, minimills have made inroads into the flat products as well.
[35] We thank an anonymous referee for this suggestion.

for firm i two years prior to the event year. One consequence of trade protection is that it frequently results in higher prices. Higher prices should translate into an increase in financial leverage, which in turn should generate positive abnormal returns (Lenway et al., 1990). Alternatively, financial leverage is in effect the use of debt in a firms' capital structure, which may suggest a competing effect on shareholder wealth since higher debt may increase the probability of financial distress. Therefore, the expected sign of financial leverage is ambiguous.

As in Hartigan et al. (1986), we control for import penetration measured as the percentage change in the value of U.S. imports between the year prior to the event and the year of the event by product (NAICS).[36] We expect those firms facing higher import levels to react more positively to the initial investigation, the final USITC decision, and the announcement of the safeguards, since these events signal protection from import competition. Conversely, we would expect a negative reaction to the WTO ruling and the removal of the safeguards, as these events signal the removal of a more substantial degree of trade protection for industries facing a higher level of import penetration.

We also control for the size of each steel firm's Byrd disbursement. The Byrd Amendment, officially known as the Continued Dumping and Subsidy Offset Act (CDSOA) was enacted in 2001 and the first disbursements were made at the end of 2001. By February 2003, the U.S. government had paid out a total of $560 million in disbursements: $230 million to 900 claimants in 2001 and $329 million to approximately 1200 claimants in 2002 (a 43% increase over 2001).[37] The steel firms in our sample received disbursements totaling $37,983,895 between 2001 and 2002. Integrated steel firms received the highest disbursements, totaling $26,318,156 – more than twice the $11,665,738 in disbursement received by minimills. Since Byrd recipients had, by definition, already indicated a reliance on trade protection, we expect

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[36] Thus, we control for import penetration at the product level. For example we control for the fact that Ford faces competition from BMW, Toyota, etc., which are all in the same product group.
[37] These data were obtained from www.ebearing.com, "The United States Continued Dumping and Subsidy Offset Act of 2000".

Byrd disbursement size to be positively related to the cumulative abnormal returns in the second stage for the first three events: initiation of the investigation, the final USITC decision, and the imposition of the duties, since these announcements all signaled the implementation of safeguard protection. Alternatively, if we assume diminishing returns to trade protection, then the impact of the safeguards may not have had as big an impact for those firms receiving higher disbursements, since these firms already received some form of protection prior to the safeguards. Hence, the expected sign of the Byrd amendment is ambiguous. Detailed data descriptions are in the data appendix.

5. Results: Steel Industry

5.1 Results from the First-Stage: U.S. Steel Producers

For the first-stage regressions, we estimate four event windows for all five safeguard investigation events: 1) the initiation of the safeguard investigation, 2) the final USITC affirmative decision, 3) the imposition of the steel safeguards, 4) the WTO ruling that the U.S. violated WTO rules, and 5) announcement of steel industry restructuring--the removal of the steel safeguards. Results appear in Table 2.[38]

Estimates from the first event, the announcement of the safeguard investigation, suggest that firms reacted positively to the initiation of the safeguard investigation—a harbinger of trade protection. The announcement of the investigation led to positive abnormal returns between 6%-8%.

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[38] A critical component of any event study is to check whether there are any confounding events that may be driving the apparent shareholder response to the event(s) under investigation. In our case, this would certainly include announcements regarding ongoing steel antidumping and countervailing duty investigations made during the event windows of our five chosen safeguard events. As expected, a number of steel cases were initiated during the crisis, but almost no key decisions were actually made during our event windows. Since the DOC almost always finds evidence of dumping, key (newsworthy) decisions of interest include the final USITC injury determination and, to a lesser extent, the date of implementation for any affirmative cases. Fortunately, no key AD or CVD events occurred during the (-10, +1) window surrounding our five key events. However, affirmative ITC determinations for five stainless steel bar cases were reached on March 8, 2002 - three days after the implementation of the safeguards (event 3). On the other hand, stainless steel bars represent less than one percent of all steel bars products made in the US, most of which are produced by minimills.[38] In other words, because stainless steel bars represent only a minute faction of total steel output, we do not believe that news regarding these five AD cases would elicit a significant enough reaction by shareholders to contaminate our safeguard results.

The evidence regarding shareholder response to the second event, the affirmative USITC injury determination yields some interesting results. During the three-day event window surrounding the actual announcement (-1, +1), shareholders experienced a smaller wealth gain than the positive response to the President's initiation of the investigation, indicating perhaps that shareholders had already anticipated the affirmative final USITC decision. However, an affirmative injury decision confirms to shareholders that the steel industry is not performing well (it faces "serious" injury), and hence we may observe a negative response in the form of negative abnormal returns, which we found in both anticipatory windows. Moreover, shareholders may have been disappointed over news that more Commissioners recommended 20% tariffs rather than the 40% tariff level.[39] These mixed sentiments are also suggested by the *negative* CARs that are found for the first two event windows.

Our third event, the announcement by President Bush to impose steel tariffs (capped at 30%) led to wealth gains of just over 5% during the three-day window. CARs were also positive and statistically significant in the one and two-week anticipatory windows, revealing the optimism that steel shareholders had towards the safeguards. Of course, U.S. trade partners collectively challenged the validity of the tariffs, and on July 11, 2003, a WTO panel ruled that the safeguard duties violated WTO law. The decision was based on the panel's determination that the U.S. had failed to demonstrate a primary causal link between the steel industry's problems and import competition, a prerequisite for safeguard duties under WTO law.

As somewhat expected, steel shareholders responded negatively to the WTO announcement, with negative abnormal returns of around -5% during both the one and two-week anticipatory windows. This is an important finding, since it reveals the apprehension the shareholders carry concerning adverse WTO rulings. First, sudden non-compliance with international trade law may result in early cancellation of 'illegal' protection that could otherwise

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[39] USITC Commissioners Koplan, Miller, and Hillman recommended 20% tariffs on carbon sheet products, while Commissioners Bragg and Devaney recommended 40% tariffs. Commissioner Okun recommended quotas on these products. See ITC publication 3479 at http://hotdocs.usitc.gov/docs/pubs/201/PUB3479.pdf.

result in foreign retaliation. And in fact, the safeguards were cancelled just days before WTO-mandated E.U. retaliatory tariffs were scheduled for implementation. Moreover, the decision to ignore a WTO ruling (and continue with unlawful protection), and thereby face retaliation, could lead to public resentment and diminish the success of future campaigns for steel protection.

On December 3, 2003, approximately five months after the WTO ruling, the Bush Administration removed the steel safeguards. A spokesman for the Bush Administration noted in July of 2003 that, "The steel safeguard measures were already working. The domestic industry has undergone an unprecedented level of consolidation and restructuring over the last year, making it more competitive with imports."[40] Our results indicate that there were statistically significant wealth gains following the cancellation of the safeguards. We presume that steel shareholders reacted positively to the safeguard's early removal because the announcement confirmed the industry's improved state. Moreover, higher prices and profits were apparently less due to the safeguards and more a result of domestic restructuring, growing Chinese demand for imported steel, and macroeconomic forces.[41] We also acknowledge that a percentage of the wealth gain may have been due to the formation of International Steel (ISG), which was formed out of the assets from the bankruptcies of Bethlehem Steel, LTV Corp., and Acme Metals.

We also test whether some steel firms benefited (or lost) more than others with respect to the timeline of events. For the announcements of the initiation of the investigation, imposition of the safeguards, and the removal of the safeguards, we reject the null that the CARs are equal

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[40]Quote by Richard Mills, a spokesman for U.S. Trade Representative Robert Zoellick in the Associated Press, July 11, 2003, "WTO panel rules that U.S. steel duties are illegal".

[41] The trend in the steel industry's recovery involved a price increase of 40% from the start of 2002 to mid-2003. For example, the price of hot-rolled steel sheets rose from $210 a ton in the beginning of 2002 to $400 a ton in July of 2002. In 2003, prices rose from $260 a ton in July of 2003 to $295 a ton in October of 2003, with expected price increases to follow up to $320 a ton. (Pittsburgh-Post Gazette, 11-14-2003). Reports also revealed that substantial cost savings were taking place in the industry due to decreasing labor costs from productivity gains and favorable union negotiations that allowed for more worker flexibility on the production lines. The government also assumed the costs of pensions and health care for retired workers. Additionally, the dollar fell 10% against the euro in 2003, lowering the relative price of U.S. steel in the world market and reducing steel imports into the U.S. Finally, China's steel consumption rose by more than 50% in the first half of 2003, and China was forecasted to consume 300 million tons of steel compared to the 120 million consumed in the U.S.[41] Consequently, the excess supply of steel in Brazil, South Korea, and Japan was diverted away from the U.S. market towards China.

across all steel firms suggesting that some firms benefited more than others for these three events. Below, we buttress these results by partitioning the sample by type: integrated and minimill steel firms. The results suggest that the larger integrated firms may be the steel firms that benefited more from these events relative to the smaller minimill firms. This makes sense since most integrated products received the maximum tariff rates that were double the magnitude of several minimill products. With respect to the WTO announcement, we are not able to reject the null that the CARs are equal across firms. This suggests that the WTO announcement indicating that the U.S. violated WTO law may have, on average, negatively impacted all of the steel firms.

5.2 Second Stage: Explaining CAR's from Safeguard Announcements: U.S. Steel Firms

Table 4 presents empirical results from separate regressions that attempt to explain the cumulative abnormal returns for our five focus events. We conduct F-tests for all specifications and find that four of the five specifications reject the hypothesis that all slopes are zero, with the exception of the USITC Final Decision specification. Table 3 contains descriptive statistics for our second-stage steel explanatory variables.

Our second-stage yields many salient outcomes. We start by analyzing the factors that impacted CAR fluctuations during the preliminary USITC investigation. We include a dummy variable that takes value of "1" for integrated producers, which produce steel primarily from raw materials rather than the recycling technology employed by minimills. Estimates reveal that integrated steel firms observed a higher positive abnormal return relative to minimills for both the initiation of the safeguard investigation and the removal of the safeguard duties. A somewhat expected result since integrated firms have more experience with (and dependence on) trade relief. Moreover, individual steel products dominated by integrated firms received the maximum

30 percent tariff level, double the rate of several minimill-dominated products.[42] However, integrated producers also experienced higher positive abnormal returns by 11.3% when the safeguards were removed. We suspect that this is because shareholders of integrated firms, which have traditionally attempted to obtain and keep comprehensive protection for as long as possible, were especially elevated by news confirming the industry's improved state.

Interestingly, integrated firms experienced *negative* abnormal returns relative to minimills for the actual imposition of the safeguards. We suspect that integrated producers were anticipating or at least hoping for a higher duty than the 30% cap, especially since some members of the USITC initially suggested duties of 40%. Moreover, imports from Canada and Mexico were excluded from the tariffs, meaning that key sources of foreign steel could supply equal or greater quantities to the U.S. once the safeguards were implemented. Hence, the negative reaction may be attributed to disappointment regarding country exclusions and the negative differential between the expected and actual duty.

We also control for the unintended consequence of protection on the share returns of U.S. subsidiaries of foreign multinational firms. Safeguards could benefit multinationals, since tariffs provide protection to their U.S. subsidiaries, but could also hurt multinationals if the tariffs are levied against steel imports from foreign affiliates. Our estimates reveal that multinational firms experience lower CARs for both the safeguard investigation and the removal of the global safeguards. This is not surprising, since profits of foreign multinationals are only partially determined by the economic welfare of their U.S. affiliates. While domestic steel firms, which

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[42] Integrated products including carbon flat-rolled products and tin mill sheet, as well as minimill-dominated hot-rolled bar and cold-finished bar were all scheduled to face tariffs rates of 30 percent in year one, 24 percent in year two, and 18 percent in year three. Minimill products such as reinforcing bar, stainless steel bar and stainless steel wire goods would all face rates of 15 percent in year one, 12 percent in year two, and 9 percent in year three. Finally, stainless steel wire rod, also made in minimills, was scheduled for rates of 8 percent in year one, 7 percent in year two, and 6 percent in year three.

are wholly or primarily engaged in production on U.S. soil, can more directly receive the benefits of protection.[43]

We also include the steel firm's financial leverage to control for the financial standing of the firm. Lenway et al. (1990) suggest that wealth gains from protection may go to bondholders rather than equityholders. Our results, however, do not support this theory, indicating instead that steel firms with higher financial leverage responded to safeguards more positively than less leveraged firms.

The conventional belief is that firms with a greater market share should experience higher wealth gains from trade protection. However, we find results consistent with our alternative hypothesis for market share, that higher market share indicates greater vulnerability in a declining industry, and the overall need for protection may reflect more negatively on firms with greater market share. Specifically, we find that a 1% increase in market share is associated with lower CARs between 2%-3% for both the initiation of the investigation and the actual imposition of the safeguards. Market share is statistically insignificant for the remaining events: the USITC final decision, the WTO ruling, and the removal of the safeguards. Our estimates also indicate that firms facing a higher degree of import penetration observed greater wealth gains in response to the initiation of the safeguard investigation and the actual imposition of the safeguards. This result is consistent with our à priori expectations that firms that face a higher degree of import penetration should receive a greater benefit from protection. Also consistent with these results, we find that in response to the WTO ruling, which increased the likelihood of an early cancellation of the safeguards, firms with a high level of import penetration observe lower CARs.

The Byrd disbursement variable controls for the level of funds received by each steel firm in our sample. The Byrd Amendment directs U.S. Customs to disburse collected antidumping

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[43] Interestingly, multinational firms observed a higher positive CAR relative to domestic firms by 0.98% for the actual imposition of the safeguard duties. However, the net effect is lower abnormal returns for multinationals relative to domestic firms.

duties to the firms that participated in the original cases. Byrd disbursements had a statistically significant effect for both the imposition and the removal of the safeguards. Results suggest that higher Byrd disbursements are associated with wealth gains for the imposition of the safeguards and a wealth decline for the removal of the safeguards. These results are not surprising, as we might expect that traditional users of the U.S. trade laws would also react more positively to safeguard protection. It may also be the case that recipients of large Byrd disbursements had less of an incentive to restructure, which in turn would make them less capable of competing internationally once the safeguards were removed. Table 6 contains the descriptive statistics of the variables discussed above.

6. Results: Downstream Consumers

6.1 Results from the First-Stage-Downstream Consumers

In some instances, trade protection may have unintended consequences. In this context, tariffs tend to raise the costs for steel consumers, as tariffs precipitate higher steel prices. Higher steel prices directly affect industries that use a significant amount of steel in the production process, such as transportation equipment, electrical equipment, construction, primary metals, and fabricated metals. The extent to which consumers react negatively to the U.S. steel tariffs can be assessed from our first three announcements: the initial investigation, final affirmative USITC decision, and the imposition of the safeguards.

In Table 5, the empirical results provide some evidence that the safeguards negatively impacted steel-consuming industries. For example, when testing the entire sample of 836 consuming firms, we find that the President's announcement to initiate a safeguard investigation caused negative abnormal returns of -0.85% in the (-10, +1) anticipatory window. Performing the same analysis for each individual industry led to primarily negative but statistically insignificant CARs. The exception is electrical equipment, which experienced negative abnormal returns of around 3% in the one and two-week anticipatory windows.

While we do not find statistically significant wealth losses for most industries in response to the initial investigation, the final affirmative USITC decision appears to have resulted in wealth losses for transportation equipment, construction, furniture, and fabricated metals. Apparently, this was the event that convinced steel consumers that higher steel costs stemming from safeguard tariffs were imminent. The most extreme reaction came from the transportation equipment industry, which experienced negative abnormal returns of almost -8% in the anticipatory (-10, +1) window. Event windows closer to the announcement date are also statistically significant, but smaller in magnitude, suggesting that leakages of the investigation were absorbed by the industry before the announcement. Given that there are inadequate cost-effective substitutes for steel in auto manufacturing, higher steel costs from safeguard tariffs pose a likely threat to industry profits. In addition, falling car prices caused by increased competition made it increasingly difficult for automakers to fully pass on increased steel costs to the consumer.

The construction industry also had a fairly negative response to the USITC determination. Next to automobiles, construction is the largest consumer of steel, meaning that the threat of higher steel prices would likely be viewed adversely by shareholders of construction firms. Electrical equipment producers also experienced negative abnormal returns of around -3% in all three event windows.

Interestingly, many downstream consumers experienced positive abnormal returns around the announcement of the actual implementation of the safeguard duties. Transportation equipment, industrial machinery, and primary metals observed positive abnormal returns in response to the imposition of the safeguards.[44] If the safeguards were generally perceived as being less protectionist than initially expected, then downstream consumers should have respond

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[44] An exception was the instruments industry, which responded negatively to the actual imposition of the duties. As expected, negative abnormal returns were observed when the duties were imposed signaling a potential increase in input cost, and positive abnormal returns when the duties were removed

more favorably. For example, some members of the USITC initially recommended tariffs of approximately 40% to the President; however, the tariffs imposed were capped at 30%.

Á priori, we predicted that the WTO ruling against the safeguards and the actual removal of the safeguards would be viewed positively by downstream-consumer shareholders, since these events signaled a possible decline in steel costs. Our results are consistent with this prediction for transportation equipment, industrial machinery, and primary metals. Our remaining industries yield statistically insignificant results for the WTO ruling. Finally, transportation equipment, instruments, and primary metals experienced positive abnormal returns in response to the removal of the safeguards, as expected.

6.2 Second Stage: Explaining CAR's from Safeguard Announcements: Downstream Consumers

Table 7 presents the second-stage results for the downstream consumers of steel. The parameter estimates for the downstream consumers were obtained from a fixed effects linear specification to control for unobserved heterogeneity.[45] We control for all firm-specific characteristics that were used in our second-stage analysis on the steel industry: market share, financial leverage, import penetration, and income growth. We also include some additional explanatory variables that may be of particular importance to downstream consumers. First, we control for the level of R & D intensity, which represents the cost of developing new products or services. We might expect that firms with high R & D intensities to react more negatively to the safeguards if they are more sensitive to cost fluctuations. On the other hand, it could also be the case that research-intensive firms are less focused on short-term profits and therefore more immune to temporary cost increases brought on by steel safeguards.

We also include a measure of the firm's steel cost share, and assume that the downstream industries which use relatively more steel (compared to other inputs) are also more likely to be

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[45] See Wooldridge (2002) for fixed effects discussion.

negatively impacted by the safeguards. To control for this, we include the cost share of purchased steel products, which is represented by the cost share of purchased steel to all materials. Our expectation is that those firms that produce goods with a higher cost shares will experience a larger wealth loss in response to the imposition of the safeguard duties. Hence, we expect that cost share will be negatively related to the first three events: initial investigation, USITC decision, and the imposition of the safeguard duties. The reverse effect is expected for the WTO ruling and the removal of the safeguard events as that would signal that the source of the price increase will be removed.

Finally, we control for whether the downstream consumer had affiliate production facilities in NAFTA countries. Our assumption is the firms that are more diversified, but can still easily ship to the U.S. market, are more immune to localized cost-increases, whether they are caused by trade protection or some other mechanism.[46] For example, if a steel-consuming firm in the U.S. suddenly faces higher costs due to the imposition of steel safeguards, it may be able to shift production towards its Canadian facility, which uses lower-cost Canadian steel.

In Table 7, F-tests indicate that all of our second-stage specifications are statistically significant except for the USITC final decision specification. In light of these findings, we focus solely on the four remaining events. Downstream consumers of steel with high market share observe lower CARs for the imposition of the safeguards, and higher CARs in response to the WTO ruling. Theoretically, financial leverage may have two competing effects on shareholder wealth. Higher leverage can increase shareholder wealth if increased debt materializes into profitable operations, or it can increase the probability of financial distress. We find evidence of the former hypothesis for the beginning of the safeguard investigation; however, results suggest that the latter effect dominates for the imposition of the safeguards and the WTO ruling.

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[46] We thank the editor for suggesting the inclusion of this variable.

The coefficient on R & D intensity is positive and statistically significant for the imposition of the safeguards and negative for the removal of the duties. This supports the hypothesis that R & D-intensive firms are less vulnerable to short run cost fluctuations brought on by upstream protection, and instead are more focused on long run profitability. Import penetration, which captures the degree of import competition for the type of steel used most heavily in the downstream consumer's production process is statistically significant for both the WTO ruling and the removal of the safeguards.[47] Theoretically, downstream consumers should benefit from higher levels of steel import penetration, since this increases the likelihood of lower steel costs. Therefore, downstream consumers that use steel products with higher import penetration should perceive the WTO determination even more positively than other downstream consumers, since the ruling increases the likelihood that duties will be removed and, correspondingly, that input costs will fall. Results regarding the WTO ruling and the removal of the duties confirm our prediction, as downstream consumers facing a higher degree of import competition observed wealth gains relative to firms subject to a lower level of import competition.

The empirical results also support the hypothesis that downstream consumers with diversified production locations fair better under the threat of higher costs due to upstream protection. We find that steel-consuming firms with affiliate facilities in Canada and Mexico responded more positively to both the initiation of the safeguard investigation and the implementation of the safeguards. Consistent with these findings, these firms do *not* respond as well to the WTO ruling that signaled the possible removal of the safeguards. In other words, since these firms are more insulated from the higher steel costs brought on by the safeguards, they had less reason to experience positive abnormal returns when the safeguards are cancelled.

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[47] For instance, import penetration for automobile producers would use the level of import penetration for carbon flat products, while construction companies would be linked to the import penetration level of carbon structural shapes.

7. Conclusion

The ongoing stream of trade relief obtained by the U.S. steel industry over the last three decades has provided researchers with a rich source of data to study the impact of protectionist policies. Interestingly, empirical articles have produced inconsistent conclusions, with results depending on the type of steel protection (tariffs, quotas, antidumping duties, price floors) and the variable(s) under scrutiny (domestic output, prices, profits, import quantities, import prices). In our study, we use event study methodology to focus on wealth gains experienced by steel shareholders in response to the implementation and removal of the recent global safeguards. While many economists view protection as a potentially stunting influence on technological innovation and competitiveness, our results suggest that steel shareholders viewed the imposition of safeguards quite positively. That is, steel firms experienced, on average, "abnormal" wealth gains. This is in clear contrast to results from Hartigan, et al. (1986), which finds shareholder indifference to safeguard announcements. Interestingly, we also find evidence of abnormal positive returns in response to the removal of the safeguards, most likely because early cancellation signaled the improved state of the industry.

Our study also analyzed shareholder reactions to the WTO ruling against the safeguards. To our knowledge, this is the first event-study to investigate the impact of WTO decision-making on shareholder wealth, and our results indicate that shareholders are reasonably sensitive to the directives of the world body. More specifically, we find that the WTO ruling led to wealth losses for steel shareholders.

Second stage tests isolate some important determinants of the abnormal returns generated by our five key events. First, integrated firms received a greater boost from the initial safeguard investigation compared to minimills, despite the increased level of minimill participation in this most recent round of protection. We also find that recipients of Byrd disbursements experienced greater gains from the safeguards, perhaps because such firms more consistently pursue and

depend on trade relief. Steel firms that face higher levels of import competition, or specialize in products that have higher levels of import penetration, also observed higher wealth gains from the safeguards. Finally, our results suggest that firms with more financial leverage also viewed the safeguards more positively, perhaps because increased leverage indicates greater financial vulnerability, and therefore greater need of support (i.e. trade relief)

Our study also analyzes the impact of the safeguards on the share returns of the downstream consumers of steel. Theoretically, safeguard tariffs should have an adverse affect on downstream consumers because tariffs precipitate higher steel prices, and therefore an increase in input costs. And if fact, our results suggest that the downstream consumers of steel generally viewed the safeguards as a cost-raising policy. This was especially true of transportation equipment, construction, and electrical equipment producers. In general, these findings support the neoclassical view that protection shifts economic welfare away from downstream-consuming industries towards the protected upstream industry.

Interestingly, most downstream consumers observed positive abnormal returns in response to the *imposition* of tariffs. This may simply be the flip side to the *negative* response from integrated steel firms to the implementation of the 30 percent tariffs, which were perhaps perceived as too small – especially when NAFTA sources were excluded. In other words, downstream consumers experienced wealth gains because there was relief amongst shareholders that the safeguards were less comprehensive than expected. The affirmative WTO decision and, to a greater extent, the actual removal of the safeguards were both greeted favorably by certain steel consuming industries, especially transportation equipment.

Second stage results suggest that steel-consuming firms more engaged in R&D are less vulnerable to protection-induced cost hikes, perhaps because shareholders focus on long-term profitability rather than short term cost fluctuations. Finally, our results indicate that steel-

consuming firms with more diversified production locations, in this case Mexico and/or Canada, are more immune to higher costs brought on by steel protection.

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Reference

Blecker, Robert A. "Markup Pricing, Import Competition, and the Decline of the American Steel Industry, *Journal of Post Keynesian Economics*12:1 (1989), 70-87.

Blonigen, Bruce and Wesley Wilson, "Foreign Subsidization and the Excess Capacity Hypothesis," mimeo, (2005).

Canto, Victor A., "The Effect of Voluntary Restraint Agreements: A Case Study of the Steel Industry, *Applied Economics* 16 (1984), 175-186.

Cima, Lawrence R., "The Excess Supply-Pure Demand Approach to International Commodity Trade: The Case of Japanese Steel Exports to the United States," *Economic Inquiry* 24 (October 1986), 645-656.

Cornett, Marcia M. and H. Tehranian, "An Examination of the Impact of the Garn-St. Germain Depository Institutions Act of 1982 on Commercial Banks and Savings and Loans, " *The Journal of Finance* 45:1 (1990), 95-111.

Durling, James P., and Matthew P. McCullough, "Teaching Old Laws New Tricks: The Legal Obligation of Non-Attribution and the Need for Economic Rigor in Injury Analyses Under US Trade Law," in Handbook of International Trade, Volume II, E. Kwan Choi and James C. Hartigan, eds., Blackwell, Malden, Mass, 2005.

Ellison, Sara F. and Wallace P. Mullin, "Economics and Politics: The Case of Sugar Tariff Reform," *Journal of Law and Economics* 38(2) (1995), 335-366.

Feinberg, Robert M. and Seth Kaplan, "Fishing Downstream: The Political Economy of Effective Administered Protection," *Canadian Journal of Economics* 26:1 (1993), 150-58.

Gallet, Craig A., "Cyclical Fluctuations and Coordination in the US Steel Industry," *Applied Economics* 29 (1997), 279-285.

Hartigan, J.C., P.R. Perry, and S. Kamma," The value of administered protection: a capital market approach," *Review of Economics and Statistics* 68 (1986), 610-17

Hartigan, J.C., S. Kamma, and P.R. Perry, "The injury determination category and the value of relief from dumping," *Review of Economics and Statistics* 71 (1989), 183-86

Hartigan, J.C., S. Kamma, and P.R. Perry, "Are Subsidies More Dangerous Than Dumping? Evidence from Wealth Effects for the Steel Industry," *Journal of Economic Integration* 9:1 (1984), 45-61.

Herander, Mark G. and Roger L. Pupp, **"**Firm Participation in Steel Industry Lobbying," *Economic Inquiry* 29:1 (1991), 134-47.

Hughes, J.S., S. Lenway, and J. Rayburn, "Stock price effects of U.S. trade policy

responses to Japanese trading practices in semi-conductors," *Canadian Journal of Economics* 30 (1997), 922-42.

Irwin, Douglas A., "Causing Problems? The WTO Review of Causation and Injury Attribution in U.S. Section 201 Cases", *World Trade Review* 2:3 (2003), 297-325.

Karafiath, Imre, "Using Dummy Variable in the Event Methodology, "The *Financial Review* 23: 3 (1988), 351-357.

Lenway, Stephanie, Rehbein, Kathleen, and Starks, Laura, "The Impact of Protectionism on Firm Wealth: The Experience of the Steel Industry," *Southern Economic Journal* 56:4 (April 1990), 1079-93.

Lenway, Stephanie, Morck Randall, and Yeung, Bernard, "Rent Seeking, Protectionism and Innovation in the American Steel Industry," *Economic Journal* 106 (1996), 410-421.

Liebman, Benjamin, "Safeguards, China, and the Price of Steel," *Weltwirtschaftliches/Review of World Economics*, forthcoming.

MacKinlay, A. Craig, "Event Studies in Economics and Finance, *Journal of Economic Literature* 35 (1997), 13-39.

Mahdavi, M., and A. Bhagwati, "Stock market data and trade policy: dumping and the semiconductor industry," *International Trade Journal* 8 (1994), 207-21

Morici, Peter, "An Assessment of Steel Import Relief Under Section 201 After One Year", http://www.steel.org/policy/trade/section201.anniversary.asp. (2003).

Rehbein, Kathleen and Laura T. Starks, "Changes in U.S. Trade Policies: The Wealth Effects on Japanese Steel Firms," *Japan and the World Economy* 7:3 (1995), 309-27.

U.S. House of Representatives. Committee on Ways and Means. Overview and Compilation of U.S. Trade Statutes. Washington, D.C.: GPO, 1997.

U.S. International Trade Commission, Publication 3479. Investigation No TA-201-73, Volume I: Determination and Views of Commissioners, December 2001.

Wooldridge, Jeffrey M., Econometric analysis of cross section and panel data. The MIT Press, Cambridge, Massachusetts, 2002.

DATA APPENDIX: The stock returns of our publicly-traded steel firms and downstream consumers were obtained from the *Center for Research in Security Prices (CRSP)*. The broad-based market index was also constructed by CRSP. Multinational firms were identified in *Compustat* as Compustat identifies those firms whose parent is not located in the U.S. Financial leverage, income growth, research and development expense were obtained from *Compustat*. Financial leverage is expressed as the average equity divided by return on average assets. Income growth is expressed as the percentage change in net income (loss) the two years prior to the event year. Net income (in millions) represents the income or loss reported by a company after expenses and losses have been subtracted from all revenues and gains for the fiscal period including extraordinary items and discontinued operations. Research and development (R & D) expenses (in millions) represents all cost incurred during the year that related to the development of new products or services including software expenses, process R & D, marketing research and testing, and engineering expenses. R & D intensity was computed using firm sales reported in Compustat. Import penetration was obtained from the ITC 204 investigation. Import penetration for downstream consumers was obtained from the *USITC Interactive Tariff and Trade DataWeb version 2.7.0*. Import penetration is expressed as the percentage change in U.S. imports one year prior to the event year. Market share was constructed as firm sales as a percentage of industry sales. Industry sales data were obtained from the *Census of Manufacturers* and firm specific sales were obtained from *Compustat*. The Byrd Disbursements were obtained from U.S. Customs which lists CDSOA disbursements by case and firm. Cost share was obtained from the USITC publication 3632: *Steel-Consuming Industries: Competitive Conditions with Respect to Steel Safeguard Measures*, investigation no. 332-452, in chapter 4. NAFTA affiliates were identified in *Mergent Online*, which lists the subsidiary locations for publicly-traded companies.

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Table 1. Event Descriptions		
Event Name	Date	Description
1. Safeguard Investigation	June 5, 2001	President Bush asks the USITC to conduct global safeguard investigation for 33 different steel products
2. USITC Final Decision	October 22, 2001	USITC determines that producers of 16 different steel products have been seriously injured by imports. Recommended coverage includes approximately 74 percent of steel import volume.[1]
3. Safeguards Imposed	March 5, 2002	President Bush imposes safeguard tariffs on 14 steel products. Imports from Canada, Mexico, Israel, Jordan, and several developing countries are not covered. Tariffs are applied to approximately 29 percent of steel imports.
4. WTO Ruling	July 11, 2003	WTO panel rules that steel safeguards violate WTO law
5. Announcement of Steel Industry Restructuring--Safeguards Removed	December 3, 2003	President Bush orders the removal of steel safeguards

Table 2. SUR First-Stage Estimates for the Global Safeguard Investigation: Summary of the Cumulative Abnormal Returns (CAR's) for Steel Firms Producing in SIC 3312.
Estimation Window = -120 to -20

Event 1: USITC to conduct global safeguard investigation (06-05-01) ψ =29

	Event Window	Mean CAR	F-test: CAR is Equal Across all Stocks
	(-10, +1)	6.87%* (0.078)	1.206 (0.216)
	(-5, +1)	8.49%*** (0.003)	0.847 (0.686)
	(-1, +1)	6.44%*** (0.000)	1.675** (0.017)

Event 2: USITC determines that steel producers were injured by steel imports (10-22-01) ψ = 27

	Event Window	Mean CAR	F-test: CAR is Equal Across all Stocks
	(-10, +1)	-3.47%*** (0.009)	1.862*** (0.006)
	(-5, +1)	-0.09%*** (0.000)	1.738** (0.013)
	(-1, +1)	0.68%** (0.017)	2.293*** (0.000)

Event 3: Safeguard tariffs imposed (03-05-2002) ψ = 24

	Event Window	Mean CAR	F-test: CAR is Equal Across all Stocks
	(-10, +1)	5.45%*** (0.005)	1.477* (0.079)
	(-5, +1)	2.32%*** (0.000)	2.476*** (0.000)
	(-1, +1)	5.16%* (0.056)	5.762*** (0.000)

Event 4: WTO panel rules that steel safeguards violate WTO law (07-11-03) ψ = 20

	Event Window	Mean CAR	F-test: CAR is Equal Across all Stocks
	(-10, +1)	-5.50%* (0.082)	0.597 (0.911)
	(-5, +1)	-5.75%** (0.014)	0.835 (0.666)
	(-1, +1)	-1.81% (0.227)	0.206 (0.999)

Event 5: Removal of steel safeguards (12-03-03) ψ = 21

	Event Window	Mean CAR	F-test: CAR is Equal Across all Stocks
	(-10, +1)	3.57% (0.204)	0.922 (0.551)
	(-5, +1)	4.72%** (0.024)	1.493* (0.082)
	(-1, +1)	0.78% (0.561)	1.945*** (0.009)

Notes: P-values are in parentheses. *, **, *** are significance levels at the 10%, 5%, and 1% levels. Ψ denotes the number of firms. The f-ratio and p-values are reported above to test whether the CARs are equal across stocks.

Table 3. Descriptive Statistics for Second-Stage Regressions for U.S. Steel Firms

Variable	Mean	Standard Deviation	Minimum	Maximum
Steel Firms:				
Multinational Firm (Dummy variable: multinational firm =1;otherwise = 0)	0.13	0.35	0	1
Type (Dummy variable: integrated firm = 1; minimill = 0)	0.47	0.35	0	1
Financial Leverage for firm i (%) (Return on Average Equity/Return on Average Assets), 2001	5.67	8.01	-4.20	29.49
Financial Leverage for firm i, 2002 (%)	3.30	5.38	-4.24	23.23
Financial Leverage for firm i, 2003	6.97	13.44	-8.85	47.97
Market Share of firm i, 2001 (%)	3.53	4.30	0.15	19.24
Market Share of firm i, 2002 (%)	4.18	5.35	0.14	24.18
Income Growth 1999-2000 (%)	-0.19	4.59	-21.18	11.11
Income Growth 2000-2001 (%)	-0.88	10.23	-49.16	11.50
Income Growth 2001-2002 (%)	0.39	5.24	-5.45	24.87
Import Penetration 1999-2000 (%)	19.58	11.07	9.9	37.7
Import Penetration 2000-2001 (%)	18.72	11.92	8.3	40.1
Import Penetration 2001-2002 (%)	18.25	10.94	8.8	35.6
Byrd Disbursement, 2001	502,519.7	1,094,649	0	4,160,116
Byrd Disbursement, 2002	552.588.5	1,282,951	0	5,899,197

Notes: See data appendix for variable descriptions.

Table 4. Second-Stage OLS Estimates for U.S. Steel Firms: Marginal Effects. White-corrected Standard Errors					
		Dependent Variable: CAR's with 3-day Event Window			
Regressors	Safeguard Investigation	USITC Final Decision	Safeguards Imposed	WTO Ruling	Restructuring-Safeguards Removed
Type	7.447** (0.029)	1.819 (0.550)	-1.312*** (0.002)	-0.862 (0.736)	11.336*** (0.000)
Multinational Firm	-2.230*** (0.009)	-1.063 (0.324)	0.983*** (0.000)	0.676 (0.527)	-3.414*** (0.000)
Financial Leverage	0.209 (0.803)	-1.479 (0.300)	0.776* (0.083)	0.718 (0.68)	-3.213*** (0.000)
Income Growth	-0.011 (0.867)	0.647* (0.070)	0.015 (0.182)	-0.012 (0.828)	-0.109 (0.286)
Market Share	-2.176** (0.056)	3.189 (0.134)	-2.870*** (0.000)	-0.202 (0.486)	-1.613 (0.234)
Byrd Disbursement	-1.400 (0.288)	-0.568 (0.654)	1.150*** (0.000)	0.577 (0.638)	-3.045** (0.010)
Import Penetration	3.490*** (0.001)	-1.467 (0.591)	1.224*** (0.004)	-2.620*** (0.000)	3.415 (0.171)
R^2	0.5937	0.4414	0.6942	0.6416	0.7790
F-statistic	5.72*** (0.002)	1.10 (0.416)	15.21*** (0.000)	7.27*** (0.006)	6.13*** (0.007)

Notes: P-values are in parentheses. ***, **, * represent statistical significance at the 1%, 5%, and 10% levels, respectively. The estimated coefficients are marginal effects specified as elasticities of the form dy/dlnx.

Table 5. SUR First-Stage Estimates for the Global Safeguard Investigation: Summary of Cumulative Abnormal Returns (CAR's) for Downstream Consumers			
Estimation Window = -120 to -20 (100 days in length)			
Event 1: USITC to conduct global safeguard investigation (06-05-01)			
	(-10, +1)	(-5, +1)	(-1, +1)
All Consumers	-0.85%*	0.04%	-0.38%
(ψ = 836)	(0.10)	(0.657)	(1.000)
Transportation Equipment	-1.65%	-0.17%	-1.04%
(ψ =93)	(0.254)	(0.871)	(0.116)
Electrical Equipment	-2.70%*	-2.80%**	-1.02%
(ψ =188)	(0.078)	(0.013)	(0.156)
Industrial Machinery	-1.39%	-0.82%	-0.47%
(ψ =250)	(0.235)	(0.335)	(0.381)
Instruments[48]	3.12%	0.86%	2.15%
(ψ =172)	(0.455)	(1.000)	(0.555)
Construction	-1.74%	3.34%	-0.27%
(ψ =23)	(0.573)	(0.148)	(0.854)
Furniture	-2.02%	-1.79%	-2.32%
(ψ =13)	(0.639)	(0.577)	(0.262)
Primary Metals	-3.27%	-0.49%	-0.39%
(ψ =12)	(0.584)	(0.911)	(0.891)
Fabricated Metals	1.92%	1.50%	0.79%
(ψ =73)	(0.257)	(0.234)	(0.332)
Event 2: USITC determines that steel producers were injured by steel imports (10-22-01)			
	(-10, +1)	(-5, +1)	(-1, +1)
All Consumers	0.61%	-0.67%***	-0.14%
(ψ =836)	(1.000)	(0.000)	(1.000)
Transportation Equipment	-7.96%***	-5.52%***	-1.64%**
(ψ =93)	(0.000)	(0.000)	(0.030)
Electrical Equipment	-3.36%***	-3.50%***	-2.36%***
(ψ =188)	(0.000)	(0.000)	(0.000)
Industrial Machinery	0.27%	-0.24%	0.61%
(ψ =250)	(0.846)	(0.798)	(0.269)
Instruments	0.07%	-0.60%	-0.25%
(ψ =172)	(0.982)	(0.784)	(0.834)
Construction	-5.61%*	-6.92%***	-0.45%
(ψ =23)	(0.053)	(0.001)	(0.741)
Furniture	-5.35%	-5.21%*	-0.76%
(ψ =13)	(0.210)	(0.099)	(0.704)
Primary Metals	-2.54%	-1.84%	0.33%
(ψ =12)	(0.535)	(0.545)	(0.864)
Fabricated Metals	-0.39%	-2.49%**	-1.59%**
(ψ =73)	(0.778)	(0.014)	(0.015)

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[48] CAR's for Instruments were obtained by the conventional method as specification tests rejected SUR and the OLS parameter specification.

Table 5 (continued). SUR First-Stage Estimates for the Global Safeguard Investigation: Summary of Cumulative Abnormal Returns (CAR's) for Downstream Consumers Estimation Window = -120 to -20 (100 days in length)			
Event 3: Safeguard tariffs imposed (03-05-2002)			
	(-10, +1)	(-5, +1)	(-1, +1)
All Consumers	0.86%***	0.52%*	0.26%
(ψ =836)	(0.000)	(0.100)	(1.000)
Transportation Equipment	5.44%***	1.67%	0.45%
(ψ =93)	(0.000)	(0.105)	(0.478)
Electrical Equipment	2.06%	0.89%	1.07%
(ψ =188)	(0.367)	(0.580)	(0.230)
Industrial Machinery	2.33%**	0.99%	0.68%
(ψ =250)	(0.023)	(0.200)	(0.167)
Instruments	-3.57%**	-0.48%	-1.67%*
(ψ =172)	(0.050)	(1.000)	(0.100)
Construction	5.53%*	3.06%	-0.49%
(ψ =23)	(0.051)	(0.151)	(0.720)
Furniture	3.34%	0.32%	0.54%
(ψ =13)	(0.447)	(0.922)	(0.797)
Primary Metals	8.87%*	7.73%*	4.45%*
(ψ =12)	(0.094)	(0.052)	(0.082)
Fabricated Metals	1.45%	-0.90%	-0.78%
(ψ =73)	(0.428)	(0.510)	(0.377)
Event 4: WTO panel rules that steel safeguards violate WTO law (07-11-03)			
	(-10, +1)	(-5, +1)	(-1, +1)
All Consumers	1.26%	0.71%	0.02%
(ψ =836)	(1.000)	(1.000)	(1.000)
Transportation Equipment	0.39%**	-0.22%***	-0.22%
(ψ =93)	(0.020)	(0.008)	(0.658)
Electrical Equipment	3.29%***	2.78%***	0.69%
(ψ =188)	(0.007)	(0.002)	(0.229)
Industrial Machinery	0.97%***	0.41%***	-0.63%***
(ψ =250)	(0.000)	(0.000)	(0.000)
Instruments	0.39%	0.31%	0.45%
(ψ =172)	(0.193)	(0.512)	(0.514)
Construction	-1.34%	0.30%	2.54%**
(ψ =23)	(0.615)	(0.877)	(0.045)
Furniture	-1.08%	0.53%	-0.34%
(ψ =13)	(0.715)	(0.808)	(0.807)
Primary Metals	-2.26%	-1.18%	-1.11%
(ψ =12)	(0.494)	(0.632)	(0.477)
Fabricated Metals	1.76%	0.00%	-0.83%
(ψ =73)	(0.256)	(0.998)	(0.260)
Event 5: Removal of steel safeguards (12-03-03)			
	(-10, +1)	(-5, +1)	(-1, +1)
All Consumers	0.21%***	0.27%	0.12%**
(ψ =836)	(0.000)	(1.000)	(0.050)
Transportation Equipment	2.56%***	1.59%**	1.89%***
(ψ =93)	(0.008)	(0.027)	(0.000)
Electrical Equipment	-2.10%*	-0.81%	-0.64%
(ψ =188)	(0.075)	(0.332)	(0.218)
Industrial Machinery	-1.09%	-1.45%**	-0.53%
(ψ =250)	(0.183)	(0.017)	(0.173)

Instruments (ψ =172)	0.67% (0.527)	0.37% (0.548)	0.30%*** (0.000)
Construction (ψ =23)	1.00% (0.780)	-2.11% (0.428)	-0.25% (0.880)
Furniture (ψ =13)	-4.25% (0.122)	-1.93% (0.102)	-3.35% (0.143)
Primary Metals (ψ =12)	1.07% (0.704)	0.82% (0.698)	0.51% (0.707)
Fabricated Metals (ψ =73)	3.83%*** (0.003)	2.66%*** (0.007)	1.62%*** (0.010)

Notes: P-values are in parentheses. *, **, *** are significance levels at the 10%, 5%, and 1% levels of significance. Ψ denotes the number of firms.

Table 6. Descriptive Statistics for Second-Stage Regressions for Downstream Consumers

Variable	Mean	Standard Deviation	Minimum	Maximum
Downstream Consumers:				
Financial Leverage for firm *i*, 2001 (%)	3.74	49.75	-515.22	1352
Financial Leverage for firm *i*, 2002 (%)	-1.69	91.48	-1839.75	212.94
Financial Leverage for firm *i*, 2003 (%)	3.25	16.63	-147.19	288.26
Market Share of firm i, 2001 (%)	0.15	0.565	0	9.94
Market Share of firm i, 2002 (%)	0.16	0.68	0	10.14
Market Share of firm i, 2003 (%)	0.16	0.68	0	12.14
Income Growth 1999-2000(%)	-1.11	22.89	-432.37	208.96
Income Growth 2000-2001 (%)	1.21	39.39	-75.11	1099.75
Income Growth 2001-2002 (%)	0.45	11.88	-89.95	239.96
Import Penetration 1999-2000(%)	0.18	0.25	-0.60	2.19
Import Penetration 2000-2001 (%)	-0.01	0.22	-0.38	1.85
Import Penetration 2001-2002 (%)	0.03	0.17	-0.77	2.03
Cost share of purchased steel to all inputs, 2003	0.288	2.17	0	54.49
R & D Intensity, R & D expense as a percentage of sales, 2001 (%)				
R & D Intensity, 2002 (%)	0.454	7.44	0	199.81
R & D Intensity, 2003 (%)	0.204	1.16	0	26.50
NAFTA	0.4731	0.499	0	1

Notes: See data appendix for variable descriptions.

Table 7. Second-Stage Fixed Effects Estimates for Downstream Consumers: Marginal Effects[49][50]

Regressors	Safeguard Investigation	USITC Final Decision	Safeguards Imposed	WTO Ruling	Restructuring-Safeguards Removed
			Dependent Variable: CAR's with 3-day Event Window		
Market Share	0.054 (0.602)	0.055 (0.859)	-0.179* (0.086)	0.034* (0.100)	-0.003 (0.890)
Financial Leverage	0.538*** (0.001)	0.018 (0.919)	-0.139** (0.019)	-0.065*** (0.001)	-0.010 (0.572)
Income Growth	-0.001 (0.925)	-0.005 (0.756)	0.011 (0.493)	-0.003 (0.604)	-0.002 (0.658)
R & D Intensity	-0.119 (0.183)	-0.040 (0.676)	0.191* (0.046)	-0.006 (0.797)	-0.049*** (0.001)
Cost Share	-3.892 (0.804)	-3.233 (0.832)	5.933 (0.728)	0.116 (0.525)	-0.320 (0.162)
Import Penetration[51]	-	-	-	0.101** (0.025)	0.084** (0.025)
NAFTA	0.697*** (0.030)	0.244 (0.482)	0.593* (0.089)	-0.521** (0.002)	0.105 (0.618)
F-statistic	2.97*** (0.004)	0.15 (0.988)	2.30** (0.033)	4.72*** (0.000)	2.25* (0.029)

Notes: P-values are in parentheses. ***, **, * represent statistical significance at the 1%, 5%, and 10% levels, respectively. The estimated coefficients are marginal effects specified as elasticities of the form dy/dlnx.

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[49] The USITC, WTO, and removal announcements are pooled OLS specifications. Specification tests rejected the fixed and random effects specifications in favor of pooled OLS. An individual Hausman test for the investigation and imposition of the safeguard announcements favors the fixed effects specification in lieu of the random effects specification; hence the investigation and safeguard announcements are fixed effect estimates.

[50] The additional parameters from the fixed effects model and constants from the initial regressions were not reported for succinctness.

[51] STATA dropped import penetration from the regression equation. It is noted in cases where variables are dropped and are not collinear with the other regressors; that the dropped variable is picked up in the fixed effects. We found that import penetration is not collinear with any of the other regressors. See STATA manual for further explanation.