Trade Deflection and Trade Depression[†,‡]

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Abstract

This is the first paper to empirically examine whether the United States' use of antidumping and safeguard tariffs, or "trade remedies," to restrict imports distorts foreign countries' exports to third markets. We first develop a theoretical model of worldwide trade in which the imposition of a trade remedy by one country - an antidumping duty or a safeguard measure - causes significant distortions in world trade flows. We then empirically test this model by investigating the effect of US trade remedies on Japanese exports of roughly 5200 commodities into 37 countries between 1992 and 2001. Our estimation of a fixed-effects model of Japanese exports yields evidence that US remedies both deflect and depress Japanese export flows. Imposition of a US antidumping measure against Japan deflects trade: export growth to Japan's non-US trading partners rises by approximately 12 percentage points. The imposition of a US antidumping measure against a third country depresses trade: Japanese export growth to the third country falls by approximately 30 percentage points.

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1 Introduction

In March 2002, the United States imposed a "safeguard" - a broad-based set of tariffs and quotas - on imports of steel to shield its domestic industry from foreign competition. Shortly thereafter, the European Union and a number of other steel-importing countries responded by imposing their own import restrictions on steel.[1] The EU partially justified its trade policy change by arguing that the change in US trade policy would re-route or "deflect" Asian steel exports - initially destined for the newly closed US market - to what would have otherwise been a relatively open EU market.[2]

Are the EU's concerns in the steel case consistent with historical experience? When a large importing country, such as the US, uses trade remedies such as a safeguard or antidumping duties to protect domestic producers from imports, does this lead to the substantial deflection of exports to third country markets like the EU? This is the first paper to address this question empirically. We present a simple theoretical model to illustrate the EU's argument on deflected trade. This model embodies the potential differential impact on world trade flows of a country-specific antidumping duty (AD) versus a nondiscriminatory safeguard measure (SG).[3] We test the model's implications on a panel of Japanese commodity exports from 1992-2001 that is matched at the product level to changes in US trade policy through the application and removal of antidumping duties and safeguard measures. We investigate whether there is evidence that the US use of trade remedies has an impact on Japanese export patterns. A related issue we examine is whether the form of the remedy - antidumping duty or safeguard measure - has a differential impact on the size of any potential distortions.

In the empirical investigation, we use a fixed effects model to estimate the impact that imposition

[1] In addition to the EU, other WTO members that imposed at least preliminary safeguard protection on steel products between March 2002 and October 2003 included Chile, China, Czech Republic, Hungary, Poland and Venezuela (WTO, 2002 and 2003). Canada and Bulgaria had also initiated steel safeguard investigations after the US imposition of protection but did not apply protection.

[2] The 25 March 2002 EU press release announcing its steel safeguard response to the US steel safeguard of 5 March noted that "[w]hilst US imports of steel have fallen by 33% since 1998, EU imports have risen by 18%. Given that worldwide there are 2 major steel markets (EU with 26.6m tonnes of imports in 2001 and US with 27.6m tonnes), this additional protection of the US steel market will inevitably result in gravitation of steel from the rest of the world to the EU. This diversion is estimated to be as much as 15m tonnes per year (56% of current import levels)." (EU, 2002)

[3] A 'nondiscriminatory' trade policy or tariff is one that is applied equally to all importing countries, i.e. all imports into a country face the same tariff rate. The term most-favored-nation (MFN) will be synonymous with 'nondiscriminatory' for the purpose of this paper. A 'discriminatory' or 'preferential' trade policy is one in which an importing country applies different tariffs to imports from different countries. For example, the import tariff on goods from regional trade agreement partners is usually lower than that imposed on goods from other countries. Although the WTO requires that all its members have nondiscriminatory trade policies, there are numerous exceptions to this rule. Two of the most important exceptions in practice are that the WTO allows for discriminatory tariffs when countries participate in preferential trade agreements and when countries impose antidumping duties.

or removal of US trade remedies (AD and SG measures) have on Japanese exports to third countries. We use a dataset that consists of Japanese exports of roughly 5200 commodities into 37 countries between 1992 and 2001 to assess the effect of US remedies, thus exploiting the substantial variation across commodities and time of Japanese exports to third countries. Our empirical approach allows us to estimate the impact of a US-imposed, Japan-specific antidumping duty on Japanese exports, identifying the amount of trade *deflected* to third markets. In addition we are able to identify a second impact of US antidumping duties on Japanese exports; when a US duty is applied against a third country's exports, Japanese exports of the targeted commodity to the third country market are *depressed*.

Japan is a particularly useful starting point for the investigation for a variety of reasons. First, Japanese firms are frequently targeted by acts of US country-specific import protection; e.g., Japanese firms made up 10% of the US antidumping caseload that resulted in duties between 1992 and 2001.[4] Over this period, the US imposed antidumping duties on 171 unique commodities from Japan.[5] Second, Japanese exporters are particularly prominent in world trade. Japanese total exports as a share of world total exports was 7.5% in 1997, the midpoint of our sample.[6] Third, Japanese exports to the US represent a substantial share of Japan's total exports - roughly one quarter of total exports[7] - allowing for the possibility of substantial trade being deflected to third country markets after the imposition of a US trade remedy.

Our formal econometric results suggest that US import restraints over the 1992-2001 period both deflect and depress Japanese export flows to third countries. Imposition of a US antidumping duty against Japanese exporters is associated with substantial deflection of trade: an increase in Japanese export growth to non-US trading partners of approximately 12 percentage points. Relative to Japan's trade-weighted average export growth over this period of 15 % per annum, this represents an increase of about 80%. There is also evidence of trade depression: simultaneous imposition of a US antidumping duty against both Japan and a third country is associated with a fall in Japanese exports to the third country of roughly 18 percentage points. The magnitude of the trade depression effect on Japanese exports is even larger when the US imposes an antidumping duty against a third country, but not against Japan: Japanese export growth to third countries falls approximately 30 percentage

[4] Japan was actually the second most targeted exporter, when measured as the number of petitions resulting in duties, as China made up 16% of the caseload. Nevertheless, available Chinese data was of insufficient quality to examine the questions under investigation in this paper.

[5] Furthermore, an additional 117 different 6-digit HS products that Japan exports to third countries were potentially affected by US trade remedies that targeted a third country's exports.

[6] Japanese exports as a share of world total exports peaked in 1986 at 10.3%. These calculations are based on the data provided in Feenstra (2000) and include intra-EU trade in the calculation of world total exports.

[7] See table 2.

points. Finally, when faced with a US safeguard measure, Japanese export growth to third countries falls by somewhere between 47 and 85 percentage points. These results provide evidence that the concerns voiced by the EU in their response to the March 2002 act of US import protection may not be unfounded, given the historical experience with US trade remedies and the associated Japanese export response.

Our empirical analysis, which examines how a discriminatory trade policy change affects trade flows, fits broadly into the literature on preferential trade agreements initiated by Viner (1950). Viner identified that discriminatory trade policies associated with preferential trade agreements (PTAs) had both positive 'trade creation' welfare effects due to the enhanced trade between members (allowing members to exploit comparative advantage amongst themselves) and negative 'trade diversion' welfare effects by potentially reducing trade between members and non-members (and thus preventing the full exploitation of worldwide comparative advantage). Ultimately, Viner recognized that the overall welfare effect of a PTA would have to be assessed empirically. More recently, a substantial theoretical literature (including, but not limited to Bond and Syropoulos, 1996; Bagwell and Staiger, 1997, 1999, forthcoming; Levy, 1997; Ethier, forthcoming; and McLaren, 2002) examine the role of preferential policy exceptions in multilateral trade agreements.[8] These papers typically focus on the *import source* diversion as the mechanism through which discriminatory trade policies affect welfare; the domestic welfare losses are derived from importing from someone who is not the lowest cost producer and failing to (globally) exploit comparative advantage. In contrast, our analysis will focus on *export* diversion where global welfare costs would arise because the low cost exporter is being shut out of a market for which it would potentially be the most efficient producer if there were non-discriminatory application of tariffs.

Our empirical approach is most similar to Romalis (2002) which investigates the import source diversion of Mexican and Canadian exports to the US resulting from the North American Free Trade Agreement (NAFTA) and the earlier Canada-US Free Trade Agreement (CUSFTA), respectively.[9] Romalis uses a similarly disaggregated panel of product-level export data and finds that Mexican and Canadian shares of US imports have increased most rapidly in the commodities facing the largest changes in trade policy; i.e., where the greatest PTA tariff preferences were conferred. While not the focus of his analysis, in presenting information on two of his controls, Mexican and Canadian shares

[8] For a survey of other recent papers focusing on different theoretical elements of the interaction between preferential and multilateral agreements, see Krishna (forthcoming). For a literature survey on the nondiscrimination principle and the economic aspects of the MFN clause in trade agreements, see Horn and Mavroidis (2001).

[9] Clausing (2001) is another recent paper that looks at the trade creation and trade diversion effects of the CUSFTA through an analysis of a panel on commodity level trade data and tariff changes. Romalis (2002) presents a thorough discussion of the differences in approaches and results of the two papers.

of EU imports, he documents evidence that is consistent with our results regarding the deflection of trade.[10] Although related, our paper differs from Romalis' both in terms of the question we ask and in terms of the empirical methodology we employ. Romalis uses a difference-in-differences approach to examine if changes in US trade policy (NAFTA and CUSFTA) produced import source diversion. We use dynamic panel data methods to examine if changes in US trade policy (AD and SG) are associated with the *deflection* and also the *depression* of exports.

With respect to the economics literature on trade remedies, our results on the trade distorting effects of antidumping measures complement the work of Prusa (2001).[11] Prusa uses a panel of US industry-level imports and data on US antidumping measures for 1980-1994 to investigate the import source diversion that occurs for the United States when a discriminatory trade policy causes importers to switch from a lower cost to a higher cost foreign supplier. He provides evidence that foreign exporters in an industry subject to a US AD measure who are *not-named* in an antidumping petition increase exports to the US in conjunction with the exports of the country targeted by the AD petition falling. Our paper can provide insight as to where the commodities targeted by the US petition go, since they are no longer being exported to the US market.[12]

The rest of this paper proceeds as follows. Section 2 presents our simple economic model to flush out our empirical predictions. Section 3 presents our empirical model that will be used in the estimation and a discussion of variable construction and data. In section 4 we discuss our empirical results, and section 5 concludes with a discussion of additional questions and further puzzles for future research.

2 Theoretical Model

Assume there are three countries indexed i or $j \in \{A, B, C\}$, $i \neq j$. Each country has one firm, also indexed i or j, which produces a single good for domestic consumption and for export. A good is denoted m_{ij}, where the first index, i, indicates the country of production, and the second index, j, indicates the country in which the good is consumed. Thus, a good produced by firm i for export

[10] We interpret Romalis' Figures 1B and 1C for Mexico and Figures 2B and 2C for Canada as evidence of the deflection of exports from the EU to the US. Starting from a non-discriminatory benchmark, the discriminatory *removal* of US trade barriers *lowers* tariffs facing a Mexican or Canadian commodity, and leads to trade being deflected*away from* a third market like the EU.

[11] For a recent survey of the economics literature on antidumping, see Blonigen and Prusa (forthcoming). For a survey on safeguards protection, see Bown and Crowley (forthcoming).

[12] While we do not investigate the issue here, our results suggest that there may also be substantial welfare distorting effects of acts of US trade remedies outside of the US, in addition to the sizable welfare distortions experienced *inside* the US and documented, for example, by Gallaway et al (1999).

to country j is denoted m_{ij}. Output produced for domestic consumption is denoted m_{ii}. Markets are segmented, firms compete on quantity, and the good produced for domestic consumption and the imported goods are strategic substitutes ($\pi_{m_{ii}m_{ji}} < 0$, $\pi_{m_{ji}m_{-ji}} < 0$).

Production in each country employs the same technology. The marginal cost of production is increasing, the cost function is $c(x_i)$ where $c'(x_i) > 0$ and $c''(x_i) > 0$ and x_i is firm i's total output. Firm i's total output is the sum of domestic sales and sales in the two foreign markets, $x_i = \sum_j m_{ij}$, $j \in \{A, B, C\}$.

Inverse demand in all countries is given by $p(Q_i, Y_i)$ where Q_i is the total output sold in country i and Y_i is national income. Total output sold in i is the sum of domestic sales by the domestic firm and imports from the other two countries, $Q_i = \sum_j m_{ji}$, $j \in \{A, B, C\}$.

The objective of the firm in i is to chose a total output level and a level of sales for each market in order to maximize profits,

$$\max_{m_{ij}} \pi_i = \sum_j \left[p(Q_j)m_{ij} - \tau_{ij}m_{ij}\right] - c(x_i), \tag{1}$$

where τ_{ij} represents country j's tariff on imports from i and τ_{ii}, the tariff on consumption of the domestically produced good, is equal to zero. The firms' first order conditions are given by the following:

$$\frac{\partial \pi_i}{\partial m_{ij}} = p(Q_j) + p'(Q_j)m_{ij} - \tau_{ij} - c'(x_i) = 0. \tag{2}$$

Solving the first order conditions for each $j \in \{A, B, C\}$ yields firm i's best responses to the sales decisions of the other two firms. A best response function specifies an amount to sell in each market, given the sales in that market of the firm's two rivals. Solving the nine best response functions simultaneously yields the Cournot Nash equilibrium quantities sold by each firm in each country.

$$m_{ij} = f\big(p(Q_i, Y_i), c(x_i), \tau_{ij}\big) \quad \forall i, j \in \{A, B, C\} \tag{3}$$

In the Cournot Nash equilibrium, because the marginal cost of production is increasing, each firm will choose to allocate its total output across the three countries so that its net marginal revenue (marginal revenue less tariff costs) is the same in all three markets.

2.1 Comparative Statics for an antidumping duty

Without loss of generality, suppose that trade among the three countries is free, with the exception that country A imposes a tariff on imports from country B. How will an increase in A's tariff affect trade among all three countries? Figure 1 provides an illustration of proposition 1.

Proposition 1 *For the three country Cournot model in which goods are strategic substitutes and firms face increasing marginal costs in production, a tariff by country A against country B causes, relative to the free trade equilibrium:*

1. *trade destruction, a decline in country B's exports to country A* ($\frac{dm_{ba}}{d\tau_{ba}} < 0$)*,*
2. *trade creation via import source diversion, an increase in country C's exports to country A* ($\frac{dm_{ca}}{d\tau_{ba}} > 0$)*,*
3. *trade deflection, an increase in country B's exports to country C*($\frac{dm_{bc}}{d\tau_{ba}} > 0$)*, and*
4. *trade depression, a decrease in country C's exports to country B* ($\frac{dm_{cb}}{d\tau_{ba}} < 0$)*.*

Proof: Totally differentiating the nine first order conditions given by (2), dividing through by $d\tau_{ab}$, and applying Cramer's rule yields the signs of the comparative static effects on the domestic output and exports of all three firms of an increase in country A's tariff on imports from country B. For strategic substitutes and an increasing marginal cost of production, without loss of generality, the following results are obtained for a change in τ_{ba}: for goods consumed in country A, $\frac{dm_{aa}}{d\tau_{ba}} > 0$, $\frac{dm_{ba}}{d\tau_{ba}} < 0$, $\frac{dm_{ca}}{d\tau_{ba}} > 0$, for goods consumed in country B, $\frac{dm_{bb}}{d\tau_{ba}} > 0$, $\frac{dm_{ab}}{d\tau_{ba}} < 0$, $\frac{dm_{cb}}{d\tau_{ba}} < 0$, for goods consumed in country C, $\frac{dm_{cc}}{d\tau_{ba}} < 0$, $\frac{dm_{bc}}{d\tau_{ba}} > 0$, $\frac{dm_{ac}}{d\tau_{ba}} < 0$. QED.

In this model, the existence of a deflected trade flow relies critically on the assumption of an increasing marginal cost of production. Because firms equate the net marginal revenue of producing for each market in equilibrium, anything that raises the cost of selling in one market will cause firms to reallocate their sales across markets.

2.2 Comparative Statics for a safeguard tariff

Without loss of generality, suppose that trade among the three countries is free, with the exception that country A imposes a tariff on imports from countries B and C. Assume that the magnitudes of the tariffs set against B and C are identical ($\tau_{ba} = \tau_{ca}$) and given by τ. How will an increase in country A's tariff affect trade among all three countries?

Proposition 2 *For the three country Cournot model in which goods are strategic substitutes and firms face increasing marginal costs in production, a tariff by country A against all other countries (B and C) causes, relative to the free trade equilibrium:*

1. *trade destruction, a decline in country C and B's exports to country A* ($\frac{dm_{ba}}{d\tau} < 0$, $\frac{dm_{ca}}{d\tau} < 0$) *and*

2. *two-way trade deflection, an increase in country B's exports to country C($\frac{dm_{bc}}{d\tau} > 0$) and an increase in country C's exports to country B($\frac{dm_{cb}}{d\tau} > 0$).*

Proof: Totally differentiating the nine first order conditions given by (2), dividing through by $d\tau$, and applying Cramer's rule yields the signs of the comparative static effects of an increase in country A's tariff on imports from all countries on the domestic output and exports of all three firms. For strategic substitutes and an increasing marginal cost of production, without loss of generality, the following results are obtained for a change in τ: for goods consumed in country A, $\frac{dm_{aa}}{d\tau} > 0$, $\frac{dm_{ba}}{d\tau} < 0$, $\frac{dm_{ca}}{d\tau} < 0$, for goods consumed in country B, $\frac{dm_{bb}}{d\tau} > 0$, $\frac{dm_{ab}}{d\tau} < 0$, $\frac{dm_{cb}}{d\tau} > 0$, for goods consumed in country C, $\frac{dm_{cc}}{d\tau} > 0$, $\frac{dm_{bc}}{d\tau} > 0$, $\frac{dm_{ac}}{d\tau} < 0$. QED.

Comparing a discriminatory antidumping policy and a nondiscriminatory safeguard, the theoretical model predicts that two phenomena observed under an antidumping duty - trade creation via import source diversion and trade depression - are absent under a safeguard. Because a safeguard creates an identical increase in costs on products from both import sources, there is no incentive to favor one source over another. Thus, the result that no trade is created through import source diversion is fairly obvious. With regard to the model's prediction of two-way trade deflection under a safeguard, the result is less obvious. For each country B and C, the safeguard induces two conflicting forces of trade depression and trade deflection. Retained domestic production that can no longer be sold in country A could "crowd out" imports and lead to trade depression, but in the model this effect is swamped by each firm's strong desire to export so that it will not be competing against itself in its domestic market.

In the next section, we test the model's predictions about trade deflection, trade depression, and two-way trade deflection on a panel of Japanese commodity exports. Our approach is thus different from papers by Romalis (2002) and Prusa (2001) who estimate empirical models of what we refer to as "trade destruction"[13] and "trade creation via import source diversion," respectively.

3 Empirical Model and Estimation

3.1 The empirical investigation

The theoretical model presented in section 2 yields a number of predictions relating one country's tariffs to trade flows between foreign countries. Our empirical analysis focuses on the predictions of deflected, depressed and two-way deflected trade for Japanese exports to 37 non-US trading partners. For clarity of exposition, ignoring Japan's 36 other trading partners, what does our theoretical model

[13]More precisely, Romalis estimates the opposite effect - trade creation arising from the removal of a tariff.

predict when the country imposing tariffs is the US and the foreign countries are Japan and the EU? First, if the US imposes a country-specific tariff against Japan in the form of an antidumping duty and imposes no tariff against the EU, the model predicts *deflected* trade, an increase in Japanese exports to the EU. Second, if the US imposes a country-specific tariff against the EU in the form of an antidumping duty, but not against Japan, the model predicts that Japanese exports to the EU will fall, i.e., *depressed* trade. In this case, European exports that are diverted away from the US market by the tariff and sold domestically within the EU depress imports from Japan. Third, if the US imposes tariffs against both Japan and the EU in the form of a broadly-applied safeguard measure or two simultaneously-imposed antidumping duties, the model predicts two-way deflected trade, a rise in Japanese exports to the EU and in EU exports to Japan.[14]

3.2 Basic empirical model

To investigate the questions identified by the theoretical model, we develop the following reduced-form specification for the value of Japanese exports to country i based on equation (3):[15]

$$vm_{iht} = \alpha_i + \gamma_h + \beta_1' Y_t + \beta_2' Y_{it} + \beta_3' e_{it} + \beta_4' \tau_{ht} + \beta_5' \tau_{iht} + \beta_6' vm_{iht-1} + \beta_7' c_{kt} + \epsilon_{iht}, \qquad (4)$$

where i denotes an importing country, h denotes a 6-digit HS commodity, and t denotes time in years. The index k denotes an industry aggregate at the 3-digit ISIC level, i.e. the commodities $h = 1..h'$ map into the industries $k = 1$, $h = h'..h''$ map into $k = 2$, and so on until $h = h^*..H$ map into $k = K$.

The variable vm_{iht} denotes the value of imports of h into i at time t, Y_t denotes Japan's national income (an export-supply shifter), Y_{it} denotes the importing country i's national income (an import-demand shifter) and e_{it} is the exchange rate between the yen and the importing country's currency. The variable τ_{ht} designates US trade policy against Japan while τ_{iht} captures US trade policy against importing country i. Japan's industry k cost variables are denoted by c_{kt}.

3.3 Estimation strategy

There are two problems to address in estimating equation (4). First, the autocorrelation of vm_{iht} implies that least squares estimation of (4) yields biased estimates. Second, in a short panel,

[14] We do not test for the rise in EU exports to Japan here as our analysis focuses on the response of Japanese exports only.

[15] Unfortunately, only the value of imports is consistently available in the TRAINS data, so we cannot analyze the price and quantity responses to a trade policy change separately.

the number of parameters to be estimated (α_i and γ_h) increases with the number of countries and commodities. Thus, α_i and γ_h cannot be consistently estimated.

Following Arellano and Bond (1991), we address both of these problems by estimating the first difference of (4) and instrumenting for the lagged change in imports with the lagged level.[16] Taking the first lag of (4) and subtracting this from (4) yields the basic estimating equation:

$$\Delta vm_{iht} = \beta_1' \Delta Y_t + \beta_2' \Delta Y_{it} + \beta_3' \Delta e_{it} + \beta_4' \Delta \tau_{ht} + \beta_5' \Delta \tau_{iht} + \beta_6' \Delta vm_{iht-1} + \beta_7' \Delta c_{kt} + \Delta \epsilon_{iht} \qquad (5)$$

Because of the dynamic panel structure of our data, there are two potential problems with the IV estimator; bias associated with the use of a weak instrument and bias associated with correlation in measurement error. In appendix A we address both of these concerns. To address the weak instrument problem, we test the quality of two instruments, vm_{iht-2} and vm_{iht-3}. We find that both are strong instruments for Δvm_{iht-1} and conclude the IV approach is appropriate for our problem. To address the issue of measurement error, we compare coefficient estimates using the second and third lags of the logged level of imports. We find that our coefficient estimates are robust to the choice of instrument, suggesting that measurement error in vm_{iht} is not a significant problem and the use of vm_{iht-2} as an instrument is appropriate.

To address the concern that our model may be misspecified, in appendix B we conduct a specification test on our econometric model and conclude that our model is correctly specified.

3.4 Fixed effects model

As an additional robustness check, we estimate the following model in which we use fixed effects to control for macroeconomic and industry variation over time,

$$\Delta vm_{iht} = \eta_1' \Delta \chi_{ikt} + \eta_2' \Delta \tau_{ht} + \eta_3' \Delta \tau_{iht} + \eta_4' \Delta vm_{iht-1} + \Delta \epsilon_{iht}, \qquad (6)$$

where $\Delta \chi_{ikt}$ represents a set of country-product-year dummies in which k is a product aggregate at the 2-digit Harmonized System level and where we instrument for Δvm_{iht-1} using the second lag of the level of the value of imports. Because the country-product-year dummies absorb macroeconomic and industry-specific variation over time, this approach requires fewer control variables (e.g. GDP growth, value-added per worker) than estimation of equation (5) and thus we are able to utilize a much larger sample of trade and trade remedy data.

[16] After first differencing, direct estimation of (5) yields biased coefficients because the lagged difference of imports ($vm_{iht-1} - vm_{iht-2}$) is correlated with the error term ($\epsilon_{iht} - \epsilon_{iht-1}$).

3.5 Variable construction and data

In this section we discuss the construction of variables used in the estimation of equations (5) and (6) as well as the sources of our data. Table 1 summarizes variable descriptions and our predictions about the signs of the estimated coefficients, as well as providing summary statistics.

3.5.1 Trade variables

First consider the dependent variable in the estimation of equations (5) and (6), Δvm_{iht}, which is the annual growth of third country i's imports of commodity h from Japan. The detailed, highly disaggregated data used in this paper represent a significant improvement over many previous studies on US trade remedies. Annual data on the nominal value of imports into 37 non-US countries for roughly 5200 6-digit Harmonized System (HS) commodities for the years 1992 to 2001 come from UNCTAD's TRAINS data base. Import data for these 37 countries was reformatted into a dataset of Japanese exports to these countries.[17] In our basic specification (5), we are restricted to using a smaller set of 29 importing third countries due to the limited availability of some of the macroeconomic data needed for the estimation. The alternative fixed effects model (6) requires no macroeconomic data and utilizes a larger sample of 37 importing countries. The countries included in the final dataset include OECD members, many countries from Asia and Latin America, and some former members of the USSR and Eastern European countries. Data on Africa is generally not available in TRAINS, but as these countries are extremely small markets for Japanese exports, their omission should not affect our results. The countries used to estimate the different specifications are listed in table 2. Because the TRAINS dataset does not include commodity-specific price deflators, we deflated the nominal import data, which is reported in US dollars, using the US Bureau of Labor Statistic's HS Import Price Indices, which are available for the period 1992 through 2001.

3.5.2 US antidumping and safeguard policy variables

The main explanatory variables of interest in equations (5) and (6) are the changes to US import policy facing a commodity h exported to the US from Japan ($\Delta\tau_{ht}$) or from a third country ($\Delta\tau_{iht}$).

[17] Because this data is collected only on the import side, it is possible that discrepancies exist between a country's imports from Japan and Japan's exports to that country. We checked the quality of our Japanese export dataset against Feenstra's (2000) NBER's World Trade Database (WTDB). The WTDB includes data on worldwide import and export flows at a 4-digit SITC level and is thus too aggregated for our purposes, but is known to be of high quality because it matches import and export records to resolve any discrepancies in the values of trade flows between pairs of countries. Table 2 presents a comparison of Japan's aggregate export shares in 1996 calculated using our dataset and the WTDB. The shares from the two datasets are comparable and we feel confident in using the TRAINS data in our analysis. Nevertheless there are some years for which trade data is missing for certain countries.

Our first set of estimates, reported in table 3, uses zero/one indicators for the application and removal of AD and SG policies. Our second set of estimates, reported in table 4, uses data on the country-specific trade-weighted average of the antidumping duty in the year in which it was imposed.[18]

In our first pass, in estimating (5) we look at discrete changes in the application and removal of a US trade policy. Specifically, for a commodity h, we examine the effect of (1) the imposition of a US antidumping duty against Japan, (2) the removal of a US antidumping duty against Japan, (3) the imposition of a US antidumping duty against a third country i, (4) the removal of a US antidumping duty against a third country i, (5) the imposition of a US safeguard policy, and (6) the removal of a US safeguard policy. As discussed in section 2, the theoretical model predicts that the sign of the coefficient on (1) is positive, on (2) is negative, on (3) is negative, on (4) is positive, on (5) is positive, and on (6) is negative.[19]

We collected data on the US imposition and removal of country-specific antidumping duties and safeguard measures at the 6-digit HS level from 1992 through 2001 from a variety of US government publications, most notably the *Federal Register*. Our trade policy dataset includes information that has not been utilized by previous researchers. For antidumping and safeguard cases filed after 1988, we obtained the names and 6-digit HS codes for the products involved, the outcome of the case (affirmative, negative, or terminated and type of measure for safeguards), the names of the countries that faced the import restrictions, the trade-weighted average duty when duties were imposed, and, most importantly, the date a case was initiated, the date a trade restriction began, and the date the trade restriction was removed. From this data, we constructed a panel of indicator variables in which the indicator is equal to 1 if a trade restriction is in place against country i for HS commodity h in year t and zero otherwise. Specifically, we constructed three dummy variables: one that indicates if Japan faces an antidumping duty on its exports of commodity j to the US in year t, one that indicates if country i faces an antidumping duty on its exports of commodity h to the US in year t, and one that indicates if Japan faces a safeguard measure on its exports of commodity h in year t. We first differenced these indicator variables and constructed 6 indicator variables to capture application and removal of AD and SG policies.[20]

[18]The duty data was generously provided by Bruce Blonigen and his AD website http://darkwing.uoregon.edu/ bruceb/adpage.html .

[19]We do not investigate the impact on Japanese exports of US AD (or SG) investigations that do not result in duties, but which are terminated or settled. While such an investigation could lend further insight into the overall impact of Staiger and Wolak's (1994) "investigation effect," "suspension effect" and "withdrawal effect," of the non-duty impact of AD investigations, it is beyond the scope of issues under investigation here and thus we leave it to further research.

[20]To clarify the timing of our different variables, the variables "AD Policy imposed$_{jpn,ht}$" and "AD Policy imposed$_{iht}$" are equal to 1 in the period in which the investigation into an antidumping case that results in a duty is begun. The variable "SG Policy imposed$_{ht}$" is equal to 1 in the period in which a safeguard measure goes into effect. This reflects

3.5.3 Macroeconomic variables

We include controls for changes in the exporting (ΔY_t) and importing countries' GDP (ΔY_{it}), changes in the exchange rate (Δe_{it}), and proxies for changes in the importing countries' trade policies ($\Delta \tau_{it}$).

We expect an increase in the GDP growth of the exporting country (Japan) to lead to a fall in Japanese export growth because domestic demand for the export goods will be higher. In other words, Japan is expected to export domestic weakness. Second, in terms of currency changes, export growth should be higher when the yen is weakening relative to the importing country's currency. Thus, we expect a positive sign on the coefficient for relative currency depreciation.

For the importing country, an increase in GDP growth should be associated with higher Japanese export growth. To proxy for changes to an importing country's overall trade policy that we cannot observe, for example, an across the board tariff reduction or a reduction in the administrative cost of exporting to a particular importing country, we control for changes in an importing country's "openness." Openness is defined as the sum of real aggregate imports and exports divided by real GDP. For some countries, real aggregate import and export series were not available. For these countries, we calculated "openness" using the corresponding nominal variables. We believe that an increase in this variable is associated with liberalization of country i's trade policy, and thus, expect a positive sign on its coefficient.

Macroeconomic data - including real GDP, real aggregate imports, real aggregate exports, and exchange rates - come from two sources: the OECD Main Economic Indicators and the IMF's International Financial Statistics (IFS). Whenever possible, we used the OECD data to construct the macroeconomic controls. When OECD data were not available or were only available for a short timespan, we used data from the IFS.

3.5.4 Industry-level variables

Lastly, we use two measures of productivity changes for Japanese manufacturing industries: the growth of the average wage and the growth of value-added per worker. This addresses a concern that our policy variables may not be measuring true treatment effects, but may be picking up the effect of an omitted variable - like a Japanese productivity improvement - that would be associated with the imposition of a US import barrier on Japanese imports and an increase in Japanese export growth to other countries. We expect the sign on both productivity measures to be positive.

the fact that almost all AD cases result in duties and targeted exporters begin to respond to provisional antidumping duties from the date the investigation is announced. Safeguard cases, on the other hand, have a very uncertain outcome and almost never use temporary trade restrictions during the investigation phase.

Japanese manufacturing industry data at the 3-digit ISIC (Rev. 2) level for the years 1992-1999 came from the UN Industrial Development Organization's "Industrial Statistics Database: 2002" CD-Rom. We used data on number of employees, value-added and average wages to construct two productivity measures: the growth of value-added per worker and the growth of average wages.

4 Empirical Results

4.1 Estimation results using trade remedy indicators

Table 3 presents our estimates of equation (5) using zero/one *indicators* for changes in trade policies - i.e., the imposition or removal of a trade remedy. Specifications (1) and (2) present estimates on the full set of industries (agricultural and manufacturing) over the 1992-2001 period. Specifications (3) through (6) present estimates for all manufacturing industries from 1992-1999, all years for which the ISIC industry variables are available.

Consider first specification (1) and our estimates for the key policy variables of interest, which provide evidence in support of some of the key predictions of our theoretical model. US imposition of antidumping measures against Japan is associated with significant *deflection* of Japanese exports to third country markets, and US imposition of antidumping measures against third countries is associated with a significant *depression* of Japanese exports to those markets. In particular, specification (1) suggests that the imposition of an AD measure against Japanese exporters but not exporters from country i is associated with an 11.4 percentage point *increase* in Japanese export growth to country i. This is a substantial effect. The trade-weighted average growth of Japanese exports in this sample is 15.5% per year. Thus, the imposition of a US antidumping policy increases Japanese export growth by 73.5%. The imposition of an AD measure against the third country i's exporters, but not against Japan, is associated with an 28.8 percentage point *reduction* in Japanese export growth of that same product to country i. This is consistent with the idea that when the output produced by firms in country i cannot be sold in the US, but is sold domestically, it depresses imports of the same product from Japan.

To determine the total effect of Japanese export growth to country i when both Japan and country i face a US antidumping duty, add the coefficients from rows 1 and 3. Contrary to the prediction of our model, the total effect of a broadly-applied or "quasi-MFN" antidumping duty is a *depression* of Japanese export growth of 17.4 percentage points.[21] Perhaps surprisingly, the US imposition of

[21] It will not be truly "MFN" because exporters are likely to face different tariff rates because of differences in dumping margins calculated by the US Department of Commerce. Furthermore, while Japan and the third country i are both subject to an AD measure on the 6-digit HS product, there may be "fourth country" exporters that do not face AD

an MFN *safeguard* policy has an even stronger trade depressing effect, leading to an 85.0 percentage point reduction in Japanese exports to country i.[22]

Interestingly, the effects of the *removal* of a trade remedy do not appear to be symmetric. Again, estimates from specification (1) suggest that the removal of an AD measure against Japan does not have a statistically significant effect (0.066) on Japanese exports to a third country. Because removal of an antidumping duty is usually an anticipated event, it may be that exporting firms increase their total capacity before the duty is removed so that they don't have to reduce their third country sales in order to sell in the US market. Alternatively, Japanese exporting firms may fear reapplication of US antidumping duties and, thus, refrain from increasing their exports to the US and thus not shift sales away from the third market.

Furthermore, the removal of a US antidumping measure against a third country (-0.320) and the removal of a US safeguard measure (-0.050) appear associated with a statistically significant *reduction* of Japanese exports to third countries, which is at odds with the prediction of the theory. A possible explanation for these puzzling coefficient estimates could be that exporters respond to the removal of a trade remedy at a lag and thus, the growth in trade predicted by our theory is not captured by the contemporaneous policy removal variable. Moreover, the result with respect to the removal of an AD measure against country i is not robust to alternative specifications that utilize different samples.[23] Consequently, we have very little confidence in these particular estimates.

Finally, the coefficient estimates in specification (1) for the macroeconomic and "openness" control variables also have the predicted sign. Since they are not of particular interest to our investigation and are fairly robust across specifications, we will omit a substantive discussion of them here.

In specifications (2) through (4) of table 3, we sequentially consider additional control variables to check the sensitivity of our results. Overall, the estimates on the policy variables of interest appear robust to changes in model specification. At times, the estimates on these additional controls are inconsistent with the theory. For example, the estimated impacts of the growth in the yen/country i exchange rate, which we add in specification (2), has the wrong sign.[24]

measures, presenting it from being truly nondiscriminatory.

[22]While safeguard measures often include exemptions for free-trade partners and developing countries, in our sample, safeguard measures were applied quite broadly to almost all US import sources. The correlation coefficient between changes in US safeguard policy against Japan - the variable in our estimation - and against all other countries was 0.77. In contrast, there was considerably more variation in the application of antidumping duties. The correlation coefficient between changes in US antidumping policy against Japan and against all other countries was only 0.24.

[23]The negative and statistically significant estimate of the coefficient for AD removals against country i in specification (1) is based on 18 removal observations in a sample of 189176 observations whereas the statistically insignificant estimate in specification (13) is based on 29 removal observations in a sample of 254622 observations.

[24]This may be due to the fact that many of our observations involve importing countries whose currencies are pegged

More importantly, in specifications (3) and (4) we add *industry-level* (ISIC 3-digit) control variables (available from 1992-1999). Because our results for the policy variables are robust to the inclusion of industry level controls, we believe that the policy variables are likely capturing the true treatment effect of the policy. Unfortunately, because the industry variables are only available for manufacturing industries between 1992 and 1999, we lose a number of observations in these specifications. Specification (5) shows that the small changes to the estimates for the policy variables of interest (the slight increase in the size of the AD policy imposition variables and decrease in the size of the SG policy imposition variable) are most likely due to the loss of agricultural commodities from the sample and not to the inclusion of the industry variables.

Finally, specification (6) presents a robustness check on the results in table 3. Using the sample of manufacturing data used in specifications (3)-(5), we estimate the fixed effects specification of equation (6) described in section 3.4. The results in specification (6) are broadly consistent with those in specifications (1) - (5). The one exception is the estimated impact of the *removal* of a US AD measure against country i, which is no longer statistically significant.

To summarize the results of table 3, we find first that the US imposition of an AD duty against Japan leads to a *deflection* of Japanese trade to third markets (row 1): Japanese export growth to third markets increases by estimates ranging from 10.3 to 13.1 percentage points. This represents an increase in Japanese export growth of 66.5% to 84.5% relative to its trade-weighted average growth of 15.5% in this sample. Second, the US imposition of an AD duty against a third country is associated with the *depression* of Japanese exports to those third markets (row 3): Japanese export growth to third markets falls by 27.4 to 32.1 percentage points. Third, the US imposition of a simultaneous AD duty against Japan and a third country leads to Japanese exports to those third markets becoming depressed (adding row 1 and row 3): Japanese export growth to third markets falls by 17.1 to 19.3 percentage points. Fourth, the US imposition of a broadly applied SG measure against Japan and other exporting countries leads to a depression of Japanese trade to third markets (row 5): Japanese export growth to third markets falls by 47.0 to 85.0 percentage points.

Even though these last two points regarding our two "MFN" results are consistent, they should be accompanied by a number of caveats. First, even though two countries (Japan and a third country) may simultaneously face US AD duties against the same product, there may be substantial variation in the *level* of applied duties that our simple AD duty indicator is not capturing. For example, the

or loosely pegged to the dollar. For example, when the yen depreciates against Korea, it is also depreciating against the dollar. So, even if the yen value of exports to Korea rise when the yen depreciates against the won, the dollar value could still fall. A second explanation could be the importance of the exchange rate effects on goods traded under contracts if the value effect dominates the volume effect of a depreciation.

overall trade depressing effect of the simultaneous US imposition of AD duties could be driven by instances in which Japan faces a very low US duty and the third country exporter faces a very high US duty. Second, while there were hundreds of US AD measures imposed over the 1992-2001 period, there were only five US SG investigations which resulted in the imposition of definitive measures (tariffs, quotas or tariff-rate quotas). While each of the SG measures may affect more than one 6-digit HS category, we are nevertheless concerned about the relatively few number of safeguard observations in the estimation. This concern is further driven by the fact that some US safeguard measures covered products (e.g., brooms, lamb meat, wheat gluten) which were not of substantial importance to Japanese exporters.

4.2 Estimation results using trade remedy duty rates

Table 4 presents results using AD duty *rates* in place of the AD policy *indicators* used in table 3. The specifications and data samples in table 4 are otherwise identical to those in table 3. Using AD duty rates allows us to sharpen the estimates of the policy impact by controlling for the substantial variation in imposed levels of AD duties across observations. Note that we continue to use an indicator for US safeguard actions, because while some safeguards were imposed as tariffs, others used quantitative restrictions or tariff rate quotas.

The estimates presented in table 4 for the key variables of interest are again consistent with the model's theoretical predictions as well as the results presented in table 3. Specification (7) indicates that the imposition of a 1% AD duty against Japanese exporters but not exporters from country i is associated with an 0.220 percentage point *increase* in Japanese exports to country i. This result is broadly consistent with the results in table 3. In this sample, the distribution of AD duties imposed against Japan is 10.78% at the 5th percentile, 37.13% at the median, 47.25% at the mean, and 69.65% at the 95th percentile. Thus, imposition of an AD duty is associated with increases in Japanese export growth of 2.37, 8.17, 10.40 and 15.32 percentage points at the 5th percentile, mean, median, and 95th percentile, respectively. The imposition of a 1% AD measure against the third country i's exporters, but not against Japan, is associated with an 0.576 percentage point *reduction* in Japanese exports of that same product to country i. AD duties imposed against country i show greater dispersion than those imposed against Japan. The distribution of AD duties imposed against country i are 2.98% at the 5th percentile, 14.84% at the median, 28.69% at the mean, and 72.49% at the 95th percentile. Thus, imposition of an AD duty against country i *depresses* Japanese export growth to country i by 1.72, 8.55, 16.52 and 41.75 percentage points at the 5th percentile, median, mean, and 95th percentile, respectively. These results are consistent across all specifications presented in table 4, with the exception of the fixed effects specification (12) in which case the imposition of an AD duty against i is not statistically significant.

4.3 Fixed effects estimates from an expanded sample of data

As described in section 3.4, an advantage to using the fixed effects model is that because it does not require macroeconomic and industry controls, we can estimate it using a significantly larger sample of trade data. Therefore, in table 5 we provide a set of estimation results using data on Japanese exports to all of the countries listed in table 2 except the US. This adds to the estimation sizable import markets such as Taiwan, China, Singapore and the Philippines.[25] This adds roughly 65,000 observations to our largest sample of data presented in tables 3 and 4. Specification (13) uses the AD policy indicators, and is thus comparable to the estimates presented in table 3, whereas specification (14) uses the AD duty rates, and is thus comparable to the estimates presented in table 4.

The primary change in results using the entire sample of data in table 5 is that the estimated impact of the key policy variables of interest are slightly smaller than in the earlier specifications, though they are each statistically significant. For example, in specification (13), the estimate for trade deflection [depression] is 0.090 [-0.193], whereas it was 0.103 [-0.274] in specification (6). This is likely due to the fact that the newly added observations used in specification (13) are with Japan's less important and smaller export markets. For these smaller markets, it seems unlikely the imposition of US trade remedies would lead to substantial deflection and/or depression.

4.4 Fixed effects estimates for steel versus non-steel products

Finally, another question to consider is whether the AD or SG measures associated with the US steel industry are particularly important in our results, given that this industry is the most frequent user of US trade remedies.[26] To address this issue, in table 6 we separate out the estimated policy effects by steel and non-steel products by interacting each policy variable of interest with an indicator for whether the underlying HS 6-digit product was a steel (HS chapter 72 or 73) or non-steel product. With the exception of the estimates for the SG policy (which again are tested on a relatively small number of policy actions), the estimates suggest that the trade deflection and trade depression results may be even *stronger* for non-steel products than the steel products that have traditionally been the most active targets of US trade remedy laws. This is particularly important, given the likelihood that

[25]The results presented in table 5 use country-product-year dummies at the 2-digit HS level of aggregation. We obtained qualitatively similar results when using dummies constructed at the 3-digit HS level of aggregation.

[26]For example, for the 1992-2001 period, over 50% of US AD investigations that resulted in duties affected steel imports.

any future growth in *use* of US trade remedies is likely to come from non-steel industries as they learn from the steel industry's experience. Thus this table might suggest that future use of trade remedies may lead to even more trade deflection and trade depression than we have observed in this sample of trade remedy actions predominantly dominated by steel products.

5 Conclusion

This paper matches data on US use of trade remedies over the 1992-2001 period to Japanese commodity-level exports to third countries. We find evidence that US trade remedies both deflect and depress Japanese exports. First, the US imposition of an AD duty against Japan leads to a deflection of Japanese trade to third markets: Japanese export growth to third markets increases by 10 to 13 percentage points. Second, the US imposition of an AD duty against a third country leads to Japanese exports to those third markets becoming depressed: Japanese export growth to third markets falls by 27 to 32 percentage points. Third, the US imposition of a simultaneous AD duty against Japan and a third country leads to Japanese exports to those third markets becoming depressed: Japanese export growth to third markets falls by 17 to 19 percentage points. Fourth, the US imposition of a broadly applied SG measure against Japan leads to a depression of Japanese trade to third markets: Japanese exports to third markets falls by 47 to 85 percentage points. Furthermore, our results on the "deflection" and "depression" of Japanese exports appear stronger for non-steel relative to steel products.

There are some limitations of our results and approach. First, we have focused on the export response of only one US trading partner; we are undertaking a similar analysis of the impact of US trade remedies on other trading partners, including some developing countries in order to see how broadly our results generalize. We speculate, for example, that the ability of developing countries to deflect trade may be more limited than that of a country like Japan. Furthermore, we are less confident in our results regarding the impact of safeguard policies, as there are relatively few safeguard observations in our dataset.

Nevertheless, our results have implications for the empirical literature on the impact of trade policy decisions made by "large" countries, defined as those that are able to affect exporters' prices. For example, Chang and Winters (2002) use similarly disaggregated, commodity level data on unit values and tariffs for Brazil and its trading partners and find that the creation of MERCOSUR was accompanied with a substantial decline in the prices of non-member exporters to the region. While we do not test whether any of the countries in our analysis are "large" in the sense of their ability to affect the prices of foreign exporters, we provide evidence that the US's trade policy decisions do impact the export behavior of a particularly important trading partner.

Finally, we speculate that the results of this paper suggest an additional explanation for the proliferation of antidumping laws around the world (Miranda et al., 1998; Prusa, 2001). Much of the prior literature commenting on this proliferation has focused on the *retaliation* argument: countries adopt trade remedy laws in order to establish a credible retaliatory threat that will discourage foreign trade remedies targeted against their exporters (Prusa and Skeath, 2002; Blonigen and Bown, 2003). Our results indicate that the imposition of a US trade remedy can lead to a substantial export surge to a third country's market. This third country may therefore face pressure of its own to respond with a trade remedy. Therefore, US actions may induce trade policy actions by third country importers *in addition to* (and that is separate from) retaliation-based trade policy actions. While we do not test here for the formal link between US trade policy actions and responses by the governments of third countries facing deflected trade, our results that associate substantial export surges with US trade policy changes suggests an additional explanatory factor that should be an area of future research.

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Appendix A: Instrument Tests

There are two potential problems with the IV estimator used in estimating (5); bias associated with the use of a weak instrument and bias associated with correlation in measurement error.

First, in a dynamic panel model, if the autoregressive coefficient on imports is sufficiently large, then the lagged level of imports, vm_{iht-2} will be a weak instrument for the lagged difference, Δvm_{iht-1} (Blundell and Bond, 1998). In this case, the bias of the IV estimator in a small sample is large (Nelson and Startz, 1990). To test the quality of two instruments, vm_{iht-2} and vm_{iht-3}, the following first-stage model was estimated using each instrument for each of the specifications presented in Tables 3 and 4.

$$\Delta vm_{iht-1} = \beta_1' \Delta Y_t + \beta_2' \Delta Y_{it} + \beta_3' \Delta e_{it} + \beta_4' \Delta \tau_{ht} + \beta_5' \Delta \tau_{iht} + \beta_6' vm_{iht-2} + \beta_7' \Delta c_{kt} + \Delta \epsilon_{iht} \quad (7)$$

where vm_{iht-3} was substituted for vm_{iht-2} in some specifications. As a restricted regression, (7) was estimated under the assumption that β_6 is equal to zero. Table 7 reports results using the parameters of specification (1) in Table 3 and specification (7) in Table 4. Results for all other specifications are similar. For the model based on the parameters in specification (1), the F-stat of 2049 is far larger than the 99% critical $\chi^2(1)$ of 6.63. Likewise, for the model based on the parameters in specification (7), the F-statistic of 2049 is larger than the 99% critical $\chi^2(1)$ of 6.63. In all specifications, we find that vm_{iht-2} and vm_{iht-3} are strong instruments for Δvm_{iht-1} and conclude the IV approach is appropriate for our problem.

Second, consider the use of the second lag of the level, vm_{iht-2}, as an instrument for Δvm_{iht-1}. If there is measurement error in vm_{iht}, then measurement error in the regressor, Δvm_{iht-1}, will be correlated with measurement error in the instrument, vm_{iht-2}, and the IV estimator will be biased. An alternative IV, the third lag of the level, vm_{iht-3}, has the advantage that its measurement error will not be correlated with measurement error in the regressor. The disadvantage of this instrument is that it further shortens an already short panel. Our approach is to estimate (5) using each of these instruments for every specification reported in Tables 3 and 4. By necessity, this requires using the small sample that obtains when we use the third lag of the level as the instrument. In Table 8 we report our estimates using the parameters from specification (1) from Table 3 and specification (7) from Table 4. Results for all other specifications are similar. The coefficient estimates are robust to the choice of instrument, suggesting that measurement error in vm_{iht} is not a significant problem and the use of vm_{iht-2} as an instrument is appropriate.

Appendix B: Specification Test

As a final check on our results, we conduct a specification test on our econometric model (5). Following Ashenfelter (1978) and the training evaluation literature, we "backcast" changes in US trade policy on the growth of Japanese exports. The purpose of this specification test is to examine if changes in US trade policy affect the growth of Japanese exports *before* the trade policy change actually occurs. If they do, this would suggest that our model is misspecified. We construct a series of dummy variables equal to 1 in the year before a successful trade remedy investigation is begun, 1 in the year before a trade remedy is removed, and 0 otherwise.[27] We then estimate (5) using these lagged trade policy changes in place of the actual policy changes. Results are reported in table 9. In all specifications, the lagged imposition and removal of an AD policy against Japan are statistically insignificant; they are unable to backcast Japanese export growth. This suggests that, with respect to trade policy changes against Japan, our model is correctly specified and that the policy variables are measuring the true treatment effect of a policy change. With respect to trade policy changes against country i, the results are mixed. Trade policy removals are statistically insignificant in all specifications. However, in three of our five specifications, the imposition of an AD policy against country i is associated with a statistically significant increase in Japanese export growth in the period prior to the application of a US AD measure against country i.

[27] Due to the small number of changes in safeguards policy, there were insufficient observations to backcast the effect of safeguards.

Figure 1: Trade Flows under an Antidumping Duty

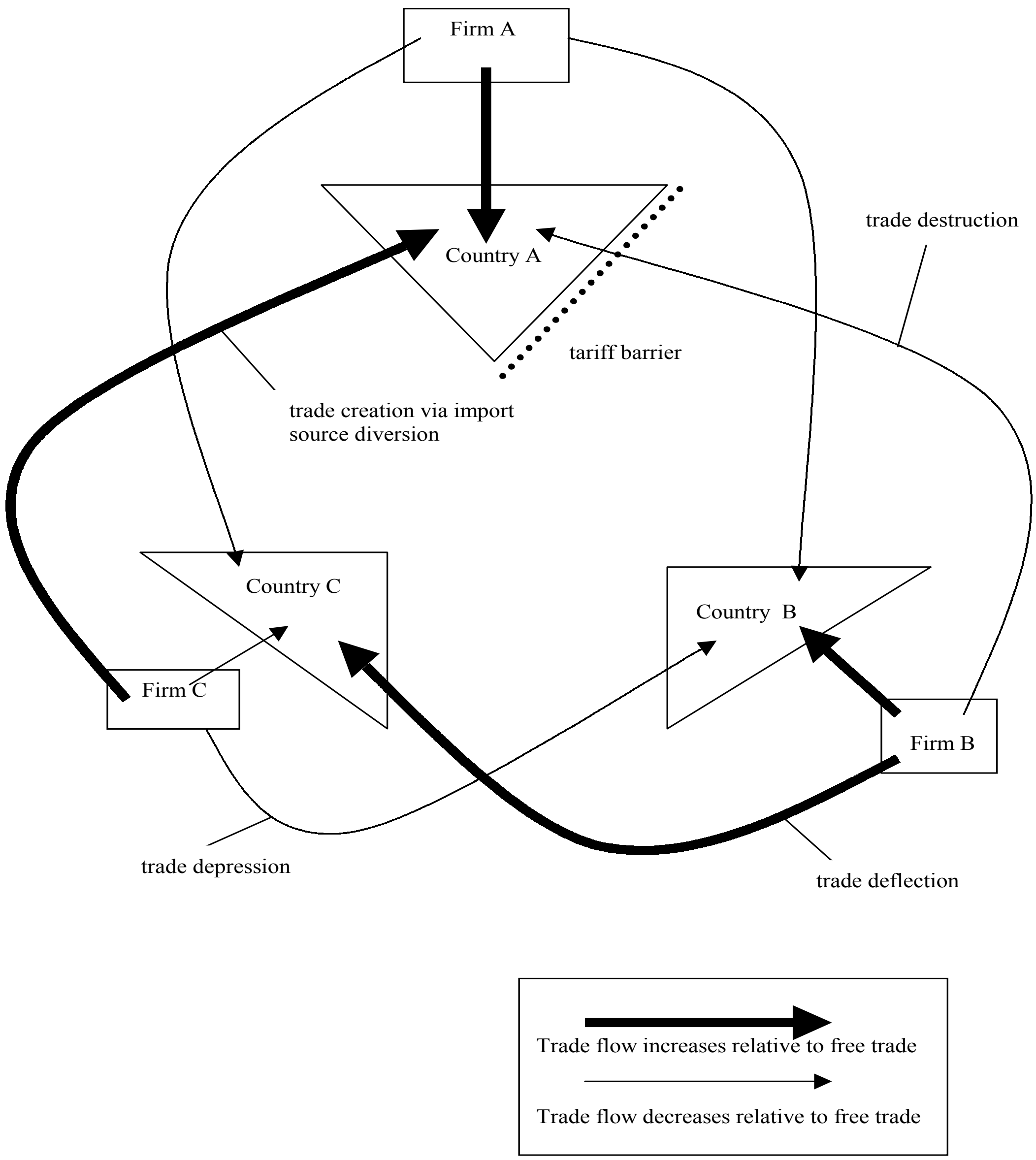

Table 1: Data Description and Summary Statistics

Variables	Vector	Description	Predicted Sign	Mean	Standard Deviation	Observations
Dependent Variable						
$\Delta\ln(vm_{iht})$	Δvm_{iht}	Growth of country *i*'s real commodity imports from Japan*		-0.0159	0.9292	254622
Explanatory Variables						
$\text{AD Policy imposed}_{\text{jpn,ht}}$	$\Delta\tau_{ht}$	Imposition of US AD policy against Japan	(+)	0.0031	0.0558	254622
$\text{AD Policy removed}_{\text{jpn,ht}}$	$\Delta\tau_{ht}$	Removal of US AD policy against Japan	(-)	0.0011	0.0335	254622
$\text{AD Duty imposed}_{\text{jpn,ht}}$	$\Delta\tau_{ht}$	Imposition of US AD duty against Japan	(+)	0.0014	0.0324	254622
$\text{AD Duty removed}_{\text{jpn,ht}}$	$\Delta\tau_{ht}$	Removal of US AD duty against Japan	(-)	0.0010	0.0369	254622
$\text{AD Policy imposed}_{\text{iht}}$	$\Delta\tau_{iht}$	Imposition of US AD policy against country *i*	(-)	0.0008	0.0281	254622
$\text{AD Policy removed}_{\text{iht}}$	$\Delta\tau_{iht}$	Removal of US AD policy against country *i*	(+)	0.0001	0.0097	254622
$\text{AD Duty imposed}_{\text{iht}}$	$\Delta\tau_{iht}$	Imposition of US AD duty against country *i*	(-)	0.0003	0.0184	254622
$\text{AD Duty removed}_{\text{iht}}$	$\Delta\tau_{iht}$	Removal of US AD duty against country *i*	(+)	0.0000	0.0060	254622
$\text{SG Policy imposed}_{\text{ht}}$	$\Delta\tau_{ht}$	Imposition of US SG policy	(+)	0.0001	0.0099	254622
$\text{SG Policy removed}_{\text{ht}}$	$\Delta\tau_{ht}$	Removal of US SG policy	(-)	0.0000	0.0040	254622
$\ln(\text{imports})_{\text{iht}-2}$	Δvm_{iht-1}	Lagged value of country *i*'s real commodity imports	(+)	6.1388	2.1068	254622
$\Delta\ln(\text{realGDP})_{\text{it}}$	ΔY_{it}	Growth of country *i*'s GDP	(+)	0.0307	0.0431	189176
$\Delta\ln(\text{realGDP})_{\text{jpn,t}}$	ΔY_t	Growth of Japan's GDP	(-)	0.0120	0.0141	189176
$\Delta\ln(\text{open})_{\text{it}}$	$\Delta\tau_{it}$	Growth of country *i*'s openness to world, $[\Delta\ln((X_{it}+M_{it})/GDP_{it})]$	(+)	0.0356	0.0798	189176
$\Delta\ln(\text{yen/curr}_{\text{i}})_{\text{t}}$	Δe_{it}	Growth of Japanese Yen relative to country *i*'s currency	(+)	-0.0763	0.2699	189176
$\Delta\ln(\text{avg.wage})_{\text{jpn,kt}}$	Δc_{kt}	Growth of Japan's industry *k* average wage	(+)	-0.0484	0.1392	158578
$\Delta\ln(\text{v.add/worker})_{\text{jpn,kt}}$	Δc_{kt}	Growth of Japan's industry *k* average value-added per worker	(+)	-0.0226	0.1347	158578

*The trade-weighted mean growth of country i's real commodity imports from Japan is 0.1654 with a trade-weighted standard deviation of 0.5850 in the sample of 254622 observations and 0.1554 with a trade-weighted standard deviation of 0.5838 in the sample of 189176 observations.

Table 2: Japan's Major Export Markets - 1996

	TRAINS		WTDB	
Country	**Rank**	**Export share**	**Rank**	**Export share**
US	1	26.4%	1	27.5%
EU [a,b,c]	2	13.7	2	15.3
Korea [a,b,c]	3	7.7	3	7.2
Taiwan [c]	4	7.1	4	6.3
China [c]	5	7.1	6	5.5
Hong Kong [a,b,c]	6	6.4	5	6.2
Thailand [a,b,c]	7	5.7	8	4.6
Singapore [c]	8	5.4	7	5.3
Malaysia [a,b,c]	9	5.0	9	3.9
Canada [a,b,c]	10	2.5	13	1.4
Indonesia [a,b,c]	11	2.2	10	1.9
Philippines [c]	12	2.0	12	1.7
Australia [a,b,c]	13	2.0	11	1.8
Brazil [a,b,c]	14	0.8	17	0.6
Mexico [a,b,c]	15	0.8	15	0.7
New Zealand [a,b,c]	16	0.6	22	0.4
Saudi Arabia [a,c]	17	0.6	16	0.7
Switzerland [a,b,c]	18	0.5	19	0.5
India [a,b,c]	19	0.5	20	0.5
Turkey [a,b,c]	20	0.4	24	0.3
Norway [a,b,c]	21	0.3	28	0.3
South Africa [a,b,c]	22	0.3	21	0.5
Israel [c]	23	0.3	26	0.3
Russia [a,b,c]	24	0.3	23	0.3
Chile [c]	25	0.2	29	0.2
Argentina [a,b,c]	26	0.2	36	0.1
Colombia [a,b,c]	27	0.2	32	0.2
Peru [a,b,c]	28	0.1	41	<0.1
Bangladesh [a,b,c]	29	0.1	42	<0.1
Poland [a,b,c]	30	0.1	40	<0.1
Czech Republic [a,b,c]	31	0.1	39	<0.1
Egypt [a,b,c]	32	<0.1	37	0.1
Hungary [a,b,c]	33	<0.1	45	<0.1
Venezuela [a,b,c]	34	<0.1	44	<0.1
Nigeria [c]	35	<0.1	43	<0.1
Panama [a,b,c]	36	<0.1	14	1.3
Guatemala [c]	37	<0.1	76	<0.1
Romania [a,b,c]	38	<0.1	85	<0.1

Notes: [a] Japanese trading partner used in estimating specifications (1), (2), (7) and (8).
[b] Japanese trading partner used in estimating specifications (3), (4), (5), (6), (9), (10), (11), and (12).
[c] Japanese trading partner used in estimating specifications (13), (14), (15) and (16).

Table 3: Estimation Results for Japanese Exports with Trade Remedy Indicators

	Dependent Variable: $\Delta \ln(vm_{iht})$					
Explanatory Variables	Baseline specification (1)	Add currency depreciation (2)	Add industry controls (3)	Substitute growth in value-added per worker (4)	Remove industry controls (5)	Fixed Effects Specification (6)
Policy Variables						
AD Policy imposed $_{jpn,ht}$	0.114 [b] (0.047)	0.114 [b] (0.047)	0.128[a] (0.048)	0.131[a] (0.048)	0.131[a] (0.048)	0.103[b] (0.051)
AD Policy removed $_{jpn,ht}$	0.066 (0.059)	0.064 (0.059)	0.059 (0.073)	0.054 (0.074)	0.052 (0.073)	-0.012 (0.084)
AD Policy imposed $_{iht}$	-0.288[a] (0.097)	-0.290[a] (0.097)	-0.321[a] (0.106)	-0.319[a] (0.106)	-0.317[a] (0.106)	-0.274[a] (0.111)
AD Policy removed $_{iht}$	-0.320[a] (0.119)	-0.332[a] (0.118)	-0.237[a] (0.081)	-0.234[a] (0.081)	-0.235[a] (0.081)	-0.038 (0.102)
SG Policy imposed $_{ht}$	-0.850[a] (0.307)	-0.847[a] (0.306)	-0.539[a] (0.003)	-0.538[a] (0.004)	-0.545[a] (0.004)	-0.470[a] (0.068)
SG Policy removed $_{ht}$	-0.050[a] (0.003)	-0.051[a] (0.003)	-0.063[a] (0.004)	-0.056[a] (0.004)	-0.050[a] (0.003)	-0.230[a] (0.066)
Other Control Variables						
$\ln(\text{imports})_{iht-2}$	-0.020[a] (0.000)	-0.021[a] (0.000)	-0.024[a] (0.001)	-0.024[a] (0.001)	-0.024[a] (0.001)	-0.043[a] (0.001)
$\Delta \ln(\text{realGDP})_{it}$	3.247[a] (0.061)	3.247[a] (0.061)	3.298[a] (0.064)	3.285[a] (0.065)	3.330[a] (0.063)	--
$\Delta \ln(\text{realGDP})_{jpn,t}$	-1.518[a] (0.175)	-1.357[a] (0.177)	-0.543[a] (0.197)	-0.662[a] (0.195)	-0.771[a] (0.191)	--
$\Delta \ln(\text{open})_{it}$	0.437[a] (0.034)	0.418[a] (0.034)	0.457[a] (0.037)	0.448[a] (0.037)	0.442[a] (0.037)	--
$\Delta \ln(\text{yen/curr}_i)_t$	--	-0.043[a] (0.009)	-0.063[a] (0.009)	-0.059[a] (0.010)	-0.060[a] (0.009)	--
$\Delta \ln(\text{avg.wage})_{jpn,kt}$	--	--	0.092[a] (0.018)	--	--	--
$\Delta \ln(\text{v.add/worker})_{jpn,kt}$	--	--	--	0.060[a] (0.019)	--	--
HS 2-digit, country *i*, year *t* fixed effect [number of fixed effects]	No	No	No	No	No	Yes [6889]
Observations	189176	189176	158578	158578	158578	158578
R^2	0.02	0.02	0.03	0.03	0.03	0.11

Notes: Subscripts *i* is an importing country, *h* is an HS 6-digit product, *k* is a 3-digit ISIC industry and *t* is a year. In parentheses are White's heteroskedasticity-consistent standard errors corrected for clusters defined on the variable defined as the HS 6-digit product and year combination. Finally, a, b and c denote variables statistically different from zero at the 1, 5 and 10 percent levels, respectively.

Table 4: Estimation Results for Japanese Exports with Trade Remedy Tariff Rates

	Dependent Variable: $\Delta \ln(vm_{iht})$					
Explanatory Variables	Baseline specification (7)	Add currency depreciation (8)	Add industry controls (9)	Substitute growth in value-added per worker (10)	R emove industry controls (11)	Fixed Effects Specification (12)
Policy Variables						
AD Duty imposed $_{jpn,ht}$	0.220 [a] (0.052)	0.220 [a] (0.052)	0.236 [a] (0.051)	0.240 [a] (0.051)	0.240 [a] (0.050)	0.207 [a] (0.055)
AD Duty removed $_{jpn,ht}$	0.081 [c] (0.043)	0.082 [c] (0.044)	0.056 (0.042)	0.053 (0.042)	0.050 (0.042)	0.027 (0.063)
AD Duty imposed $_{iht}$	-0.576 [c] (0.338)	-0.599 [c] (0.335)	-0.623 [c] (0.343)	-0.616 [c] (0.343)	-0.614 [c] (0.342)	-0.277 (0.336)
AD Duty removed $_{iht}$	-1.806 [b] (0.792)	-1.877 [b] (0.780)	-1.131 [b] (0.454)	-1.115 [b] (0.434)	-1.126 [b] (0.453)	-0.087 (0.595)
SG Policy imposed $_{ht}$	-0.849 [a] (0.307)	-0.847 [a] (0.306)	-0.539 [a] (0.004)	-0.538 [a] (0.004)	-0.545 [a] (0.004)	-0.470 [a] (0.068)
SG Policy removed $_{ht}$	-0.050 [a] (0.003)	-0.051 [a] (0.003)	-0.063 [a] (0.004)	-0.056 [a] (0.004)	-0.050 [a] (0.003)	-0.230 [a] (0.066)
Other Control Variables						
ln(imports) $_{iht-2}$	-0.020 [a] (0.000)	-0.021 [a] (0.000)	-0.024 [a] (0.001)	-0.024 [a] (0.001)	-0.024 [a] (0.001)	-0.043 [a] (0.001)
Δ ln(realGDP) $_{it}$	3.247 [a] (0.061)	3.247 [a] (0.061)	3.298 [a] (0.064)	3.286 [a] (0.065)	3.331 [a] (0.063)	--
Δ ln(realGDP) $_{jpn,t}$	-1.521 [a] (0.175)	-1.358 [a] (0.177)	-0.543 [a] (0.197)	-0.663 [a] (0.195)	-0.771 [a] (0.191)	--
Δ ln(open) $_{it}$	0.436 [a] (0.034)	0.417 [a] (0.034)	0.456 [a] (0.037)	0.448 [a] (0.037)	0.442 [a] (0.037)	--
Δ ln(yen/curr $_i$) $_t$	--	-0.044 [a] (0.009)	-0.063 [a] (0.009)	-0.059 [a] (0.010)	-0.061 [a] (0.009)	--
Δ ln(avg.wage) $_{jpn,kt}$	--	--	0.092 [a] (0.018)	--	--	--
Δ ln(v.add/worker) $_{jpn,kt}$	--	--	--	0.060 [a] (0.019)	--	--
HS 2-digit, country *i*, year *t* fixed effect [number of fixed effects]	No	No	No	No	No	Yes [6889]
Observations	189176	189176	158578	158578	158578	158578
R^2	0.02	0.02	0.03	0.03	0.03	0.11

Notes: Subscripts *i* is an importing country, *h* is an HS 6-digit product, *k* is a 3-digit ISIC industry and *t* is a year. In parentheses are White's heteroskedasticity-consistent standard errors corrected for clusters defined on the variable defined as the HS 6-digit product and year combination. Finally, a, b and c denote variables statistically different from zero at the 1, 5 and 10 percent levels, respectively.

Table 5: Fixed Effects Estimation Results for Japanese Exports, 1992-2001

Explanatory Variables	Dependent Variable: $\Delta \ln(vm_{iht})$ Policy Dummies (13)	Antidumping Duties (14)
Policy Variables		
AD Policy imposed $_{jpn,ht}$	0.090 [b] (0.045)	--
AD Policy removed $_{jpn,ht}$	0.041 (0.053)	--
AD Duty imposed $_{jpn,ht}$	--	0.162 [a] (0.053)
AD Duty removed $_{jpn,ht}$	--	0.086 [a] (0.032)
AD Policy imposed $_{iht}$	-0.193 [b] (0.083)	--
AD Policy removed $_{iht}$	-0.121 (0.105)	--
AD Duty imposed $_{iht}$	--	-0.249 [c] (0.150)
AD Duty removed $_{iht}$	--	-0.131 (0.127)
SG Policy imposed $_{ht}$	-0.591 [b] (0.285)	-0.589 [b] (0.286)
SG Policy removed $_{ht}$	-0.175 [a] (0.050)	-0.175 [a] (0.050)
Other Control Variables		
$\ln(\text{imports})_{iht-2}$	-0.033 [a] (0.001)	-0.033 [a] (0.001)
HS 2-digit, country *i*, year *t* fixed effect [number of fixed effects]	Yes [10584]	Yes [10584]
Observations	254622	254622
R^2	0.10	0.10

Notes: Subscripts *i* is an importing country, *h* is an HS 6-digit product, and *t* is a year. In parentheses are White's heteroskedasticity- consistent standard errors corrected for clusters defined on the variable defined as the HS 6-digit product and year combination. Finally, a, b and c denote variables statistically different from zero at the 1, 5 and 10 percent levels, respectively.

Table 6: Fixed Effects Estimation Results for Japanese Exports for Steel versus Non-Steel Products, 1992-2001

Explanatory Variables	Dependent Variable: $\Delta \ln(vm_{iht})$ Policy Dummies (15)	Antidumping Duties (16)
Policy Variables		
AD Policy imposed$_{jpn,ht}$ *x* (commodity *h* is Steel)	0.074 (0.053)	--
AD Policy imposed$_{jpn,ht}$ *x* (commodity *h* is not Steel)	0.121 (0.082)	--
AD Policy removed$_{jpn,ht}$	0.041 (0.052)	--
AD Duty imposed$_{jpn,ht}$ (commodity *h* is Steel)	--	0.124 (0.096)
AD Duty imposed$_{jpn,ht}$ *x* (commodity *h* is not Steel)	--	0.176 [a] (0.059)
AD Duty removed$_{jpn,ht}$	--	0.086 [a] (0.032)
AD Policy imposed$_{iht}$ *x* (commodity *h* is Steel)	-0.139 (0.092)	--
AD Policy imposed$_{iht}$ *x* (commodity *h* is not Steel)	-0.411 [b] (0.196)	--
AD Policy removed$_{iht}$	-0.121 (0.105)	--
AD Duty imposed$_{iht}$ *x* (commodity *h* is Steel)	--	0.031 (0.249)
AD Duty imposed$_{iht}$ *x* (commodity *h* is not Steel)	--	-0.448 [a] (0.145)
AD Duty removed$_{iht}$	--	-0.128 (0.128)
SG Policy imposed$_{ht}$ *x* (commodity *h* is Steel)	-0.678 [c] (0.356)	-0.674 [c] (0.358)
SG Policy imposed$_{ht}$ *x* (commodity *h* is not Steel)	-0.277 [a] (0.104)	-0.277 [a] (0.104)
SG Policy removed$_{ht}$	-0.175 [a] (0.050)	-0.175 [a] (0.050)
Other Control Variables		
$\ln(\text{imports})_{iht-2}$	-0.033 [a] (0.001)	-0.033 [a] (0.001)
HS 2-digit, country *i*, year *t* fixed effect [number of fixed effects]	Yes [10584]	Yes [10584]
Observations	254622	254622
R^2	0.10	0.10

Notes: Subscripts *i* is an importing country, *h* is an HS 6-digit product, and *t* is a year. "Steel" is a commodity within HS chapters 72 or 73. In parentheses are White's heteroskedasticity-consistent standard errors corrected for clusters defined on the variable defined as the HS 6-digit product and year combination. Finally, a, b and c denote variables statistically different from zero at the 1, 5 and 10 percent levels, respectively.

Table 7: Testing Instrument Quality

	Dependent Variable: $\Delta \ln(vm_{iht-1})$			
Explanatory Variables	Unrestricted regression based on specification (1)	Restricted regression based on specification (1)	Unrestricted regression based on specification (7)	Restricted regression based on specification (7)
Policy Variables				
AD Policy imposed $_{jpn,ht}$	0.054 (0.049)	-0.035 (0.050)	-0.003 (0.128)	-0.103 (0.090)
AD Policy removed $_{jpn,ht}$	0.121 (0.089)	0.052 (0.082)	-0.054 (0.082)	0.002 (0.072)
AD Policy imposed $_{iht}$	0.104 (0.097)	0.033 (0.098)	0.280 (0.234)	0.106 (0.230)
AD Policy removed $_{iht}$	0.250 (0.209)	0.158 (0.215)	-1.750 (1.570)	-1.243 (1.637)
SG Policy imposed $_{ht}$	0.489[b] (0.219)	0.455[b] (0.228)	0.488[b] (0.219)	0.455[b] (0.228)
SG Policy removed $_{ht}$	-1.168[a] (0.003)	-1.197[a] (0.003)	-1.169[a] (0.003)	-1.197[a] (0.003)
Other Control Variables				
$\ln(\text{imports})_{iht-2}$	-0.021[a] (0.001)	0 (by assump)	-0.021[a] (0.001)	0 (by assump)
$\Delta \ln(\text{realGDP})_{it}$	0.318[a] (0.059)	-0.265[a] (0.060)	0.318[a] (0.059)	-0.265[a] (0.060)
$\Delta \ln(\text{realGDP})_{jpn,t}$	3.946[a] (0.202)	1.030[a] (0.168)	3.942[a] (0.202)	1.035[a] (0.168)
$\Delta \ln(\text{open})_{it}$	0.386[a] (0.031)	0.060[b] (0.030)	0.386[a] (0.031)	0.060[b] (0.030)
Observations	189386	189386	189386	189386
R^2	0.0110	0.0003	0.0110	0.0003

Notes: Subscripts i is an importing country, h is an HS 6-digit product, k is a 3-digit ISIC industry and t is a year. In parentheses are White's heteroskedasticity-consistent standard errors corrected for clusters defined on the variable defined as the HS 6-digit product and year combination. Finally, a, b and c denote variables statistically different from zero at the 1, 5 and 10 percent levels, respectively.

Table 8: Testing for Measurement Error

Explanatory Variables	specification (1) using ln(vm$_{iht-2}$)	specification (1) using ln(vm$_{iht-3}$)	specification (7) using ln(vm$_{iht-2}$)	specification (7) using ln(vm$_{iht-3}$)
	Dependent Variable: $\Delta \ln(vm_{iht})$			
Policy Variables				
AD Policy imposed$_{jpn,ht}$	0.084[c] (0.049)	0.074 (0.049)	0.155[b] (0.070)	0.143[b] (0.068)
AD Policy removed$_{jpn,ht}$	0.082 (0.083)	0.075 (0.082)	-0.103[b] (0.050)	-0.097[b] (0.051)
AD Policy imposed$_{iht}$	-.0280[a] (0.100)	-0.285[a] (0.100)	-1.099[a] (0.410)	-1.120[a] (0.410)
AD Policy removed$_{iht}$	-0.290[b] (0.209)	-0.303[b] (0.136)	1.701[b] (0.810)	1.763[b] (0.800)
SG Policy imposed$_{ht}$	-0.795[a] (0.269)	-0.794[a] (0.228)	-0.794[a] (0.269)	-0.794[a] (0.275)
SG Policy removed$_{ht}$	-0.059[a] (0.004)	-0.054[a] (0.004)	-0.021[a] (0.000)	-0.054[a] (0.004)
Other Control Variables				
ln(imports)$_{iht-2}$	-0.021[a] (0.000)		-0.021[a] (0.000)	
ln(imports)$_{iht-3}$		-0.019[a] (0.000)		-0.019[a] (0.000)
Δ ln(realGDP)$_{it}$	3.370[a] (0.067)	3.317[a] (0.067)	3.371[a] (0.067)	3.318[a] (0.067)
Δ ln(realGDP)$_{jpn,t}$	-1.416[a] (0.185)	-1.727[a] (0.185)	-1.421[a] (0.185)	-1.732[a] (0.185)
Δ ln(open)$_{it}$	0.458[a] (0.036)	0.431[a] (0.036)	0.456[a] (0.036)	0.428[a] (0.036)
Observations	145279	145279	145279	145279
R^2	0.0296	0.0271	0.0297	0.0272

Notes: Subscripts *i* is an importing country, *h* is an HS 6-digit product, *k* is a 3-digit ISIC industry and *t* is a year. In parentheses are White's heteroskedasticity-consistent standard errors corrected for clusters defined on the variable defined as the HS 6-digit product and year combination. Finally, a, b and c denote variables statistically different from zero at the 1, 5 and 10 percent levels, respectively.

Table 9: Do Trade Remedies Predict Japanese Export Growth Before They're Imposed? A Specification Test

	Dependent Variable: $\Delta \ln(vm_{iht})$					
	Backcasting specification	Backcasting specification	Backcasting specification	Backcasting specification	Backcasting specification	Backcasting specification
Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)
Lagged Policy Variables						
AD Policy imposed$_{jpn,ht\text{-}1}$	-0.028 (0.052)	-0.030 (0.052)	0.002 (0.051)	-0.002 (0.051)	-0.005 (0.051)	0.023 (0.055)
AD Policy removed$_{jpn,ht\text{-}1}$	0.002 (0.078)	-0.001 (0.078)	-0.002 (0.079)	0.001 (0.078)	0.009 (0.077)	-0.010 (0.075)
AD Policy imposed$_{iht\text{-}1}$	0.154 (0.111)	0.154 (0.111)	0.197[b] (0.107)	0.199[b] (0.107)	0.194[b] (0.107)	0.138 (0.109)
AD Policy removed$_{iht\text{-}1}$	-0.009 (0.069)	-0.005 (0.069)	0.002 (0.070)	0.000 (0.070)	-0.003 (0.070)	-0.069 (0.096)
Other Control Variables						
$\ln(\text{imports})_{iht-2}$	-0.020[a] (0.000)	-0.021[a] (0.000)	-0.024[a] (0.001)	-0.024[a] (0.001)	-0.024[a] (0.001)	-0.043[a] (0.001)
$\Delta \ln(\text{realGDP})_{it}$	3.247[a] (0.061)	3.247[a] (0.061)	3.298[a] (0.064)	3.285[a] (0.065)	3.330[a] (0.063)	--
$\Delta \ln(\text{realGDP})_{jpn,t}$	-1.517[a] (0.175)	-1.355[a] (0.177)	-0.532[a] (0.197)	-0.653[a] (0.195)	-0.762[a] (0.191)	--
$\Delta \ln(\text{open})_{it}$	0.436[a] (0.034)	0.418[a] (0.034)	0.457[a] (0.037)	0.448[a] (0.037)	0.443[a] (0.037)	--
$\Delta \ln(\text{yen/curr}_i)_t$	--	-0.043[a] (0.009)	-0.063[a] (0.009)	-0.059[a] (0.010)	-0.060[a] (0.009)	--
$\Delta \ln(\text{avg.wage})_{jpn,kt}$	--	--	0.092[a] (0.018)	--	--	--
$\Delta \ln(\text{v.add/worker})_{jpn,kt}$	--	--	--	0.060[a] (0.019)	--	--
HS 2-digit, country *i*, year *t* fixed effect [number of fixed effects]	No	No	No	No	No	Yes [6889]
Observations	188989	188989	158393	158393	158393	158393
R^2	0.02	0.02	0.03	0.03	0.03	0.11

Notes: Subscripts *i* is an importing country, *h* is an HS 6-digit product, *k* is a 3-digit ISIC industry and *t* is a year. In parentheses are White's heteroskedasticity-consistent standard errors corrected for clusters defined on the variable defined as the HS 6-digit product and year combination. Finally, a, b and c denote variables statistically different from zero at the 1, 5 and 10 percent levels, respectively.