

Estimating the Macroeconomic Impacts of U.S. Anti-Dumping Enforcement

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I. Background

“Dumping” refers to the unfair trade practice of a foreign firm selling its goods in the US at a price below its domestic price or below production cost plus markup. These price/cost bases are referred to as “fair trade value”, and the difference between them and the selling price is referred to as the “dumping margin.” U.S. firms who conclude they are being adversely affected by dumping can file a petition with the U.S. Department of Commerce (DOC) and the U.S. International Trade Commission (ITC). If the petition is upheld, a duty is imposed on the buyer of the foreign shipment (Czako et al., 2003).

The benefits of AD are the prevented negative consequences had the dumping actually occurred. In this study, we examine a more specific case: What are the benefits of enforcement to prevent evasion of AD regulations? This can be further refined to asking what additional enforcement success takes place with one additional unit of effort, such as a customs officer or a specific technology?

Our analysis thus will consist of two major parts. First is analyzing the number of evasions detected and linking this to the level of effort and other features of individual cases and background conditions internal and external to government operations. Second is estimating the direct and indirect benefits of these detections. This is performed by analyzing individual markets for commodities that are being dumped to estimate the direct effects, and the using a computable general equilibrium model to estimate the indirect effects. The indirect effects include not only conventional quantity and price multiplier interactions but also aspects of market distortions and strategic behavior.

Below, we summarize the methodology to be used to estimate the direct and indirect economic impacts of Anti-Dumping (AD) policies and the metrics to be used. We also summarize the data that will be needed.

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II. Insights into Anti-Dumping Enforcement

A. Basic Considerations

In this section we discuss various aspects of detection and enforcement surrounding dumping in order to help refine our approach to estimating the direct and total costs of AD policies.

USDOC calculates the dumping margins and USITC determines whether domestic producers have incurred material injury. Following an initial determination by both government agencies of a violation, the foreign producer must post a bond or cash, within 190 days, corresponding to the preliminary margin calculation multiplied by the stated value of the shipment. CBP assesses the duties (equivalent to the AD margin) and collects these payments. They can be adjusted through formal administrative review on the basis of the final determination of the AD case by the DOC and ITC, which can take more than a year (Czako et al., 2003). Evidence indicates that once a preliminary review has been initiated, foreign firms can engage in strategic behavior, such as raising price in U.S. markets, to reduce their duty obligation. Moreover, the strategic behavior varies by commodity (sector) (Gallaway et al., 1999).

AD duties are the percentage differences between the foreign seller's price and its home market price. These duties can be adjusted annually by the USDOC. Ironically, relief from these duties can be obtained by the foreign seller raising its price in U.S. markets. This strategy can generate further losses to the U.S. as noted above.

Gallaway et al. (1999) also note that this behavior results in the appropriate analysis being more akin to examining a quota, in which the "rents" are transferred to the seller, as opposed to tariff, where the rents are appropriated by the government of the importing country.

Fischer and Mirman (1994; p. 215) suggest that "the higher the dumping margin, the higher the probability of detecting something." Fischer and Mirman also note that the larger this margin, the larger the material injury ("harm which is not inconsequential, immaterial, or unimportant" 19 U.S.C. 1677 (7) (A)) to domestic firms, which is the basis for AD action. They also state (p. 215): "The intensity with which the government pursues dumping investigations depends on political considerations and in turn, the severity of government enforcement affects the probability of detection."

Note that we will also examine the impacts of the dollar value of penalties or fees on the foreign companies exporting products that are AD violations. In the context of benefit-cost analysis, the AD duties, since paid by U.S. importers would be considered a transfer payment and would not be included. However, the fees are an infusion into the U.S. from outside and can be considered a net gain to the economy. We will examine not only the collection of the duties, but also the direct and general equilibrium impacts of their potential spending.

B. Measurement of AD Enforcement

Detection is necessary to prevent several types of evasion of dumping duties, such as illegal transshipping, undervaluation of the shipment, misclassification as a good not subject to duty, and

smuggling (GAO, 2012). In 2012, 283 duty orders were in effect (GAO, 2012). Catching these evasions prevents injury against American firms and adds to the collection of U.S. government revenue.

To analyze enforcement, we will analyze year-to-year changes in protecting evasions in relation to several explanatory variables. This will not simply be the calculation algebraic ratios but a formal regression analysis, controlling for other factors. Explanatory variables, based on the discussion in the following sections, can be grouped into 3 major categories:

Detection Variables

- CBP staff
- CBP technology
- technology change dummy variable
- other factors affecting CBP effort
- security bond amount- cooperation with DOC and ITC

Dumping Behavior Variables

- dumping margin
- strategic pricing behavior
- perception of the political environment
- time period of adjudication

Background Variables

- exchange rate
- level of imports
- competitiveness of the commodity's market share

III. Indicators of Gains and Losses

Two major approaches to metrics to gauge the direct and indirect impacts of policies are macroeconomic indicators and welfare measures. The former include Gross Domestic Product (GDP) and employment, and are often cited by policy-makers as justifications for their actions. They are most widely used where economy-wide models support the policy proposals.

Another approach is the class of “welfare” measures, which gauge the extent to which households fare. GDP includes not only households but government, investment, and export activity. The welfare measures are intended to reflect the well-being of the US population. They typically take the form of *equivalent variation* or *compensating variation*, both of which measure the concept of *consumer surplus*, or the difference between what the consumer is willing to pay for a good and what the consumer actually pays. Policies are evaluated in terms of changes in this consumer surplus value, often in percentage terms. Some analyses also consider producer surplus, or the difference between the unit price of the product and the cost of production (typically defined as economic profit).

In our analysis we utilize both approaches. They typically move in the same direction, though there are some exceptions when the issue is more related to investment goods than consumer goods. Note that

the total value of AD duties themselves is not an indicator of either the direct or total impacts of AD policies or enforcement.

IV. Estimation Methodology for Macroeconomic Indicators

A. Direct Effects

AD duties are often characterized as equivalent to tariffs on imports, where a “tariff” is simply a term used in international trade circles in place of the term import tax. As such, AD policies might be considered analogous to correcting one market distortion with another (in the AD case to “level the playing field”). This has caused many analysts to refer to AD policy as a restrictive trade practice despite the fact that it is intended to counterbalance an unfair trade practice. We will examine the separate impacts of dumping and anti-dumping, as well as the net effect.² The Direct Effects of Anti-Dumping policies can be summarized as follows (see also the expanded discussion in relation to welfare effects in Section IV):

The tariff reduces the demand for the import and causes some shift to the domestic production of the same good, which has 2 basic components:

- a. substitution effect toward demand for the domestic import counterpart. Also, a reduction in quantity demanded of the imported good.
- b. income effect associated with the overall reduction in the demand for the good (combined import and domestic) because of its now higher price (in terms of a weighted average of import and domestic prices).

The question arises as to the relative size of these two effects. The substitution effect would expand overall U.S. production directly and indirectly. However, the income effect reflects the decreased purchasing power stemming from the price increase and would lead to an overall dampening of U.S. production and consumption. Blonigen and Prusa (2003; p. 237) suggest, however, that this economic gain is illusory. They state that “presumably workers displaced from import-competing sectors are not lost to the economy that will ultimately relocate industries that are more competitive.” There are two problems with this observation. First, it implicitly assumes that markets can absorb the unemployed labor—this corresponds to the “neoclassical closure rule” in Computable General Equilibrium (CGE) modeling, the most widely used approach to estimating the macroeconomic and competitiveness effects of AD policies (see, e.g., Gallaway et al., 1999). However, in a context in which demand is lagging, their

² We know from the literature in other contexts that the corrective mechanism does not always have the intended effects. The classic example is placing a pollution tax on the output of a monopoly. While for a competitive firm this causes the producer to cut back output to the socially optimal level, if the producer is monopolist, the pollution tax further induces the monopolist to restrict its output to garner a higher price in the market. This could either mitigate or exacerbate the dead-weight loss depending on whether the monopolist’s private profit maximizing price was above or below the socially optimal price level accounting for the negative externality of the pollution.

employment is not guaranteed. This situation can be effectively modeled by the counterpart “Keynesian closure rule,” which allows for an “under-employment” equilibrium. Second, there could be an asymmetry between the jobs gained and jobs lost situation. If we use as our base, the absence of AD policies, then our simulations involve adding them and thereby likely stimulating US production on net. Under a full employment economy, this gain would have to come at the expense of other sectors from which workers would have to be drawn. On the other hand, under conditions of less than full employment, the job gains can reasonably be considered to be forthcoming.

How might one model these effects?

Using a production function for the commodity, one could increase the price of the import to determine its effect on the good it is used to produce (taking into consideration that it is likely only be a portion of all of the imports of that commodity, so that a weighted average import price must be calculated). However, if the good is used by a large number of sectors, this could be especially cumbersome to perform separately. The total economy-wide effects (including effects on each sector but with indirect, or general equilibrium, effects factored in) would be the straightforward results from a CGE simulation (see below) and would subsume the direct effects. Note that the analysis should be symmetric. We could examine the benefits of removing AD policies by reducing weighted average prices of current goods to calculate a competitive equilibrium. The differences between model base year values and the competitive values should be equivalent to those in modeling the imputed tariff itself.

2. Analyzing the direct effects of CBP enforcement of anti-dumping

This would change the tenor of the analysis. Here the focus is not so much on the price change directly through any tariff, but rather on the U.S. production displaced by the anti-competitive practices.

Data on CBP detections of violations could be used to determine the extent of displaced US domestically produced counterparts. The impacts can be modeled by a reduction in the imports of the good violating AD rules and the substitution of the domestic counterpart. Ironically, this shift is modeled by some CGE analysts by using a device known as the “phantom tax”, which raises the price of a good whose output one wishes to decrease, or, if substitution elasticities are correctly specified, also increases the output of domestic production. Interestingly, there is often an implicit assumption that the two goods are substitutes on a one-for-one basis when viewed in terms of quantities alone. However, this is tantamount to assuming an infinite elasticity of substitution between imports and domestic substitutes, which is counter to the standard Armington assumption (of imperfect substitution between imports and domestic goods of the same type, due primarily to actual or perceived quality differences) in most CGE modeling.

B. Indirect Effects

Indirect effects are of several varieties, ranging from ordinary general equilibrium effects to strategic effects to perverse incentive effects. Our CGE approach will emulate that of Dixon et al. (2003) in terms of methods and assumptions relating to AD policies, treating them as tariffs. However, rather than use

the 50-state USAGE-ITC Model, we will use the GTAP Model. We will also modify the methodology, such as using both short-run (Keynesian) and long-run (Neoclassical) closure rules

1. Ordinary general equilibrium effects refer to upstream and downstream supply-chain effects in markets in which the good in question is indirectly rather than directly involved. They can be calculated by straightforward application of CGE modeling. Ordinary general equilibrium effects might also include changes in the terms of trade, or exchange rate, which also affect the outcome. However, these relative price changes are not likely to be significant for individual anti-dumping cases, nor, for the sum total of cases in most individual markets, if they represent a small portion of the total market.

The indirect effects are important. Fischer and Mirman (1994) point out the fact that consumers and downstream producers (not the direct competitors but the customers of producers that use the imported goods as inputs “lobby for more lenient enforcement” because dumping lowers the cost of production in those sectors using the dumped goods as intermediate inputs.

2. Perverse incentive effects are best exemplified by the fact that an importer to the US facing AD duties might simply raise its price in order to avoid the penalties. In doing so, it obtains more revenue and effectively captures the tariff duties (Gallaway et al., 2009, estimate this effect might be as much as 10 times larger than the ordinary negative distortionary effects of AD policies). This does have the effect of increasing domestic production of the good through the substitution effect, but also lowers overall U.S. production directly and indirectly by decreasing purchasing power. Note that foreign firms also lower the duty by reducing their home market price of the good, though this is more rare than raising its price in the US market (Gallaway et al., 1999). Various strategic effects relating to expectations of AD policies in relation to importer pricing policies are beyond the scope of this study. Note that these behaviors relate not only to pricing, but to product quality and quantity strategies. Also, domestic firms who seek AD protection might engage in strategic behavior. For example, a domestic firm might begin employee layoffs, hoping to gain attention to injury from dumping practices.

V. Estimation Methodology for Welfare Analysis

Welfare measures are the most frequently used approach to analyzing policy impacts on individual markets. They emanate from the sound principles of benefit-cost analysis (see, e.g., Boardman et al., 2001) and focus on net effects in 2 major ways:

- a. Real resource costs, while netting out transfer payments such as taxes paid by one entity to another within a country.
- b. Netting out expenditures from value received (measured by consumer surplus) and netting out revenue received and production costs (measured by producer surplus or economic profit). The surplus changes represent the “dead-weight” loss from policy, or the unambiguous change, net of all offsetting factors.

Carbaugh and Wassink (1992) provide a basic illustration of the application of welfare analysis to AD policies, making an important distinction between final (consumer) goods and intermediate goods (those used to produce other intermediate or final products).³ In the case of final goods, the outcome of an AD duty is:

- F1. An increased price of the good to consumers in the importing country, say, the US; this decreases the excess demand for the good in the country by the amount of the duty
- F2. US competitors then receive a higher price for the good as well
- F3. The overall higher-price results in a decrease in demand for the final good and a loss of consumer surplus to drop in demand in the US
- F4. The US government collects fees from the exporter in addition to AD duties from domestic firms
- F5. Terms of trade effects result from slight fall in the exporting country's price

The question is whether the loss from F3 is higher, lower, or equal to the combined effects from F4 and F5.⁴

The case of the intermediate good, the situation is more complicated. The basic considerations are:

- I1. AD duties raise the price of the import good and cause a shift downward of US demand and hence a loss of consumer surplus
- I2. A welfare gain on the reduction of price of the quantity of the good that continues to be imported (associated with the demand shift)

The net welfare change depends on the relative size of these two effects.⁵

Interestingly, the analysis then shifts to a discussion of impacts on the production and competitiveness of the users of the important good, essentially a first round of indirect effects. Here Carbaugh and Wassink distinguish between 3 types of consumers of the imported good:

- I3a. US firms that compete with imported final goods suffer a decreasing market share because of the increase in production costs (and the inability to pass along this cost increase to their own consumers because of the competition)
- I3b. US firms who compete in foreign markets have the same outcome as I3a

³ In 2012, the majority of AD cases pertain to final goods (GAO, 2012).

⁴ See also the discussion of impacts on the exporting country in Carbaugh and Wassink (1992), and their conclusion that the AD duty on final goods will lead to a net welfare loss globally.

⁵ Again, Carbaugh and Wassink note the result is a welfare loss, since the gross gain to the US from I2 is simply a transfer payment from the exporter.

13c. US firms that do not compete with foreign producers of their output can pass along the higher cost to their customers

The analysis is exemplified by the example of a steel bearing AD case where many American equipment manufacturers, who use steel bearings as a major component, objected to the petition by an American bearing producer. Carbaugh and Wassink also note the strategic effects of price increases on bearings by foreign exporters and US markets along the lines discussed in Section II.

Note that these welfare effects, especially supply-chain effects, are estimated as part of the normal workings of a CGE model, which calculates only an overall net welfare change, in addition to calculating macro indicators such as changes in GDP and employment. When partial equilibrium impacts are not needed, the CGE approach is much less demanding of research resources and time. The supply and demand functions necessary to perform the analysis are embedded in the model and need not be extracted and applied separately sector by sector.

VI. Modeling Needs

A. CGE Modeling

Many analyses of policies and rules utilize partial equilibrium (PE) approaches, which focus on a single market. The prime example is standard benefit-cost analysis. However, many analysts have noted the limitations of PE approaches in failing to take into account standard indirect, or, in this case, general equilibrium (GE), effects of the price and quantity interactions of markets (see, e.g., Kokoski and Smith, 1987; Rose, 2015). Moreover, several of the other indirect effects peculiar to AD policies noted above can only be adequately addressed by GE models.

CGE Models represent the multi-market interactions of producers and consumers in response to price signals and external shocks, and within the limits of available capital, labor, and natural resources. Essentially, CGE models depict the economy as a set of interrelated supply chains. They are the most frequently used models to analyze both international trade and tax policy (Dixon, 2013). The strength of these models is their multi-sector detail, focus on interdependencies, full accounting of all inputs (including intermediate goods and not just primary factors production), behavioral content, reflection of the actions of prices and markets, non-linearities, and incorporation of explicit constraints.

- preferable to have a highly disaggregated model to align with specific HTS product categories
- preferable to use the latest elasticities of substitution between imports and domestically produced goods of the same type (we will compare GTAP and US ITC CGE Model parameter values)

Because CGE provides a clear linkage between the microeconomic structure and the macroeconomic environment, the model can be used to describe the interrelationship among multiple industrial sectors and markets. More importantly, it can be used to assess both direct and indirect effects from the change of public policy on various economic variables such as output, employment, prices, income and welfare.

The Global Trade Analysis Project (GTAP) Model will be adopted in this analysis. The model consists of 129 country economies, each of which is comprised of 57 industry commodity groupings, and incorporates the import/export trade linkages between them. The economic impact of AD enforcement will be assessed in a multiregional CGE framework, including other countries into regional groupings relating to the issue at hand – delineating countries or regions that are responsible for the most AD violations. (We also modify the model to take into account special features of the problem at hand based on the USITC CGE model.)

An “uncondensed” version of the GTAP model will be adopted as it includes more tax and productivity parameters than the default, condensed version. The discussion below builds on the research team’s recent experience with the GTAP Model (Avetisyan et al., 2015).

The model consists of four sets of institutions: production, household, government, and foreign trade. Each institution interacts with others while maximizing its utility or profit under budget constraints.

The production structure is an overall constant elasticity of substitution (CES) form for aggregate factors of production, whereas fixed coefficient relationships are used for intermediate inputs. Value added from primary factors, together with intermediate inputs, generate the final output. The model specifies that goods produced in different countries are imperfect substitutes. Sectoral output is modeled through a constant elasticity of transformation (CET) aggregation of total supply to all export markets and supply to the domestic market by following the approach of Lewis et al. (2001). Allocation between exports and domestic markets occurs in order to maximize revenue from total sales.

Household consumption in the GTAP model is represented by constant-difference of elasticities (CDE) functional form, whereas the household’s preferences over consumption, government spending and saving are characterized by a Cobb-Douglas relationship. All the elasticity parameters will be based on the most recent estimates collected from the literature.

International trade and transport in the model are represented by merchandise goods and “margin” services (shipping services, or transport costs), respectively. The rest of the world is treated like any other region in the model with explicit production, consumption, and trade behavior.

The economic effects of AD enforcement will be measured in terms of percent change in ad valorem tariff following the approach by Gallaway et al. (1999). The welfare effects will be measured using equivalent variation (EV), consistent with the literature (de Melo and Tarr, 1990; Francois et al., 1996). In particular, the utility decomposition function of the GTAP model will allow us to measure the influences of AD duties on the U.S. economy in terms of both resource allocation (efficiency) effects (the excess burden of taxes) and endowment effects due to changes in factor supplies (Burfisher, 2011).

B. Data

The following data are needed for each AD order for detected violations (for a number of years to be determined):

CBP Data (per case)

- type of commodity
- country of origin
- type of violation
- value of shipment
- prices, both importer stated and fair market value (the difference being the “AD margin”)
- duties actually collected vs. duties that should have been collected (where applicable)
- strategic price increases in the US market (these can be proxied by the difference between the importer selling price in the preliminary determination in contrast to the final determination of duties)

CBP Data (annual)

- inspection staff
- background conditions

Other Data

- see Background Variables and Behavioral Variables listed in previous Section II

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