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U.S.–Canadian Tomato Wars: An Economist Tries to Make Sense Out of Recent Antidumping Suits

John J. VanSickle, Edward A. Evans, and Robert D. Emerson

U.S. growers filed an antidumping case against Canadian growers of greenhouse-grown tomatoes, alleging that U.S. growers were being injured, or threatened with material injury, by imports from Canada. The U.S. Department of Commerce determined that imports of greenhouse-grown tomatoes were being sold in U.S. markets at less than fair market value. The U.S. International Trade Commission determined the “like product” to be all fresh market tomatoes, concluding the domestic industry was not materially injured. Anecdotal evidence used by the Commission Department in determining like product ignores the wealth of knowledge that economics can add. An economic model is proposed for purposes of determining like product

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JEL Classifications: F13, F17, K33, Q17

The U.S.–Canadian trade dispute filed by U.S. greenhouse growers against the Canadian growers of greenhouse-grown fresh tomatoes provides an interesting insight into trade law and dispute resolution and demonstrates the need for incorporating more economic analyses when adjudicating trade disputes. The trade dispute with Canada in the fresh tomato market is preceded by the many cases that have been filed by U.S. growers of fresh tomatoes against Mexico. A review of those petitions provides an interesting and informative backdrop for discussion about the U.S.–Canadian cases and the role of economics in de-

termining the outcomes in these cases. The specific concern of this paper is the extent to which the U.S. International Trade Commission (ITC) makes systematic use of market data in defining the “domestic like product” and the scope of the affected “domestic industry.” In view of the critical part such determinations play in a final determination of whether injury has occurred, it is posited here that an approach more transparent than the one currently employed could be more appropriate in such determinations. A simple, practical, market-based approach that would assist the relevant agencies in drawing conclusions on like product is suggested. The ITC looks for “clear dividing lines among possible like products and disregard minor variations.”¹ We begin our discussion with a brief overview of

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¹ *Torrington Co. v United States*, 747 F. Supp. 744, 748–749 (Ct Intl Trade 1990), *aff’d*, 938 F2d 1278 (Fed Cir 1991).

the legal procedures for adjudicating trade disputes in the United States.

Brief Overview of the General Framework for Adjudicating Trade Disputes in the United States

U.S. trade laws are intended to prevent unfair trade practices by foreign firms by enabling domestic producers to seek protection from imports that allegedly injure specific firms or industries. The three main statutes that offer such protection are the "Safeguard" provisions of Sections 201-3 of the Trade Act of 1974, the "Antidumping" provisions under Section 733(a) of the Tariff Act of 1930, and the "Countervailing Duty" provisions under Section 701 of the Tariff Act of 1930.² Although the analytical procedures are somewhat similar in these cases, the former (Safeguard provisions) upholds a higher injury standard than the latter. An affirmative in a "Safeguard provisions" case requires that the domestic industry must be materially harmed and that the injury is by cause of dumped imports.³ This differs from the injury standard in antidumping and countervailing duty cases that require "harm which is not inconsequential, immaterial or unimportant."⁴ In antidumping and countervailing duty cases, the criteria can be satisfied by simply showing that imports have resulted in a decline of industry capacity. However, in Safeguard cases, the evidence would have to show that there was actual closing of firms or a decline in industry capacity, in addition to other evidence of injury such as declines in prices, employment, wages, or growth or the ability to raise capital for investment.

The two federal agencies with mandates for adjudicating trade disputes in the United States are the ITC and the U.S. Department of Commerce (DOC). Following the filing of a countervailing duty or antidumping petition

with both agencies, the investigation follows a broadly classified two-step process. First, the DOC defines the subject merchandise to be investigated in the case and conducts its own investigation to determine whether an unfair trade practice occurred. For countervailing duty cases, the DOC determines whether imports received countervailable subsidies from the government of the country or any public entity. In antidumping cases, the DOC determines whether the imported product was being sold in the United States at less than fair value (LTFV). The standard measure is to first compare prices for export to home market sales. If export sales prices are less than home market prices, then that represents dumping on the part of the exporters. Home market sales are excluded when determining fair value when the home market sales are below cost of production over an extended period of time and in significant quantities and are not at prices that permit recovery of all costs within a reasonable period of time in the normal course of trade.⁵ If there are not sufficient home market sales above cost of production, then the DOC can turn to the third country test. If the third country test fails the standard of sales above cost of production, the fair value test becomes constructed value, which assesses the cost of production by taking into account the cost of production inputs. The determination of dumping margin in many agricultural cases hinges on the constructed value test.

The second step of the process involves the ITC's investigation to determine whether the domestic industry is materially injured or threatened with material injury by reason of the subject merchandise *as determined by the DOC*. In carrying out this step, the ITC is required to (a) define the domestic like product to the imported product and the scope of the domestic industry and (b) subsequently determine whether injury has been suffered by the domestic industry.

Regarding point a, above, Section 771(4)(A) of the Tariff Act of 1930, as amended, provides guidance by defining the relevant industry as the "producers as a [w]hole of a

² Section 701 provisions apply when subject imports are from a country party to the World Trade Organization. Section 303 is applied to imports from countries not party to the World Trade Organization.

³ 19 U.S.C. §2252(b)(2) (1994).

⁴ *Id.* §1677.

⁵ 19 U.S.C. §1677b(b)(1)-(2).

domestic like product, or those producers whose collective output of a domestic like product constitute a major proportion of the total domestic production of the product.”⁶ It further defines domestic like product as “a product which is like, or in the absence of like, most similar in characteristics and uses with the article subject to an investigation”⁷ The ITC, in applying the statutory standard of “like” or “most similar in characteristics and uses,” does so on a case-by-case basis (ITC 2001, p. 3). Although the ITC does not rely exclusively on any one factor in arriving at its decision, invariably when such determinations are made, the preponderance of the evidence is based on six traditional qualitative factors: physical characteristics and uses; interchangeability; common production facilities, processes, and employees; producer and customer perceptions; and channels of distribution (ITC 2001, p. 5–9). In the instances where prices have been used, they are often presented only as descriptive statistics, such as mean and price differentials, which can often be misleading. Seldom are such determinations based on econometric modeling, which has the added advantage of being able to control for “other factors” and provides a transparent and objective approach to such determination.

Following identification of the like product and domestic industry, the ITC sets out to determine injury (point b above). As alluded to earlier, the standard in an injury determination depends on the type of case involved. An affirmative determination by the ITC in an antidumping case only requires a determination that an industry in the United States is materially injured by reason of imports under investigation.⁸ In other words, dumping only needs to be a cause of material injury, and the ITC is strictly forbidden from weighing the effects of causes.⁹ The determination of injury must consider the volume of subject imports, their effect on prices for the domestic like product, and their effect on domestic produc-

ers of the like product, but only in the context of the domestic operations of the producers.

Several tests can be employed to determine whether an industry is materially injured. One is a measure of the effect of imports on the relative health of the industry, which is accomplished by considering the levels and trends of factors that can characterize industry condition. These include: (1) the price of the dumped import relative to domestic product price (price undercutting), (2) increases in volume of the dumped import, (3) price of the U.S. like product (price suppression or depression), (4) domestic output, (5) domestic sales, (6) domestic inventories, (7) domestic market share, (8) growth, (9) total volume of dumped imports, (10) capacity utilization, (11) cash flow, (12) profits, (13) productivity, (14) return on investments, (15) investments, (16) ability to raise capital, (17) employment, and (18) wages.¹⁰

These factors are weighed by the ITC in reaching their conclusion on injury. One method used by the ITC to evaluate injury with these factors is the Commercial Policy Analysis System (COMPAS, Francois and Hall). COMPAS is a set of spreadsheet-based partial equilibrium models that analyze trade-related gain or injury to specific domestic industries and the overall economy. The underlying model structure of COMPAS is an Armington model combining general information about product similarity, industry demand, supply condition, and market shares. The model distinguishes commodities by their country of origin and assumes a single constant elasticity of substitution and homotheticity of preference. The COMPAS model is sensitive to the value of the elasticity of substitution for the products, and as a result, the effects on the industry from estimated dumping margins can be understated (Alston et al.). The Staff Analysis performed by the ITC uses the COMPAS model to estimate injury, not as a definitive analysis, but as guidance in making a final determination.

⁶ 19 U.S.C. §1677(4)(A).

⁷ 19 U.S.C. §1677(10).

⁸ 19 U.S.C. §1673b(a).

⁹ S. Rep. No. 249, 96th Cong., 1st Sess. 74 (1979).

¹⁰ 19 U.S.C. §1677(7) (B)-(C).

Review of Recent Tomato Trade Dispute Cases

U.S.-Mexico Trade Disputes

Trade with Mexico in fresh tomatoes has long been a contentious issue in the United States. Mexico became a major player in the market following the embargo placed on Cuba in 1962 (VanSickle 1996). The removal of Cuba from the U.S. market opened a window of opportunity that Mexican growers and shippers seized. Mexico increased shipments of fresh tomatoes to the United States and eroded Florida's market share to the point where Florida producers filed their first antidumping petition in 1978.¹¹ That petition was withdrawn at the urging of the Carter Administration but was resubmitted the following year when increased imports continued to depress returns to Florida growers.¹² The U.S. Department of Commerce did not identify dumping in that case when it used the third country test as the measure of fair market value (i.e., comparing sales in the United States to sales of Mexican fresh tomatoes in Canada).¹³ Notwithstanding the outcome of that decision, Mexico did shift its policy regarding produce exports, managing their trade over the decade of the 1980s and in the early 1990s by imposing minimum quality standards that had the effect of controlling the volume of produce they shipped to U.S. and Canadian markets (VanSickle 1996, 1,3). Although short periods of depressed markets occurred over this period, the intensity of competition was much less than it had been (Jordan and VanSickle 1995b).

The North American Free Trade Agreement (NAFTA)¹⁴ ushered in a new era for the

produce industry and brought with it more trade disputes that were taken to the ITC and DOC. The three main provisions of NAFTA relating to tomatoes were (1) elimination of tariffs over a 10-year transition period, (2) liberalization of the transportation sector, and (3) removal of barriers to investment. Of these, the investment provisions of NAFTA and policy changes in Mexico concerning land reform and investment have had the greatest effect on Mexico's competitive advantage. U.S. growers have long held an advantage in the U.S. market for fresh produce because of their proximity to the market and because of the rapid development and adoption of new technologies. Investment provisions in NAFTA have given foreign investors more security and resulted in significant investment in the Mexican produce industry.¹⁵ This investment brought with it newer technologies that once were the domain of the U.S. industry and diminished the advantage U.S. growers held in technology. This diminished advantage was argued by Mexico to be one of the main reasons for their increased presence in the U.S. market.

A greater effect on the competitive advantage occurred because of the large peso devaluation beginning in December 1994 (VanSickle 1996, 3). Prior to NAFTA, Mexico macroeconomic policies had lowered inflation in Mexico and brought relative stability to the Mexican peso. The peso became overvalued in the early 1990s because policy makers in Mexico controlled the rate of devaluation. The peso was allowed to float beginning in December 1994 and was devalued from 3.4 new pesos to the U.S. dollar to 6.7 new pesos to the U.S. dollar in March 1995, a devaluation of almost 50%. This led to a surge in U.S. imports of Mexican tomatoes and depressed prices that resulted in a petition that was filed March 1995 with the ITC seeking relief from increased imports of fresh tomatoes under Section 201 of the Trade Act of 1974.¹⁶ A Section 201 petition allows growers to seek relief

¹¹ Certain Fresh Winter Fresh Vegetables from Mexico: Termination of Antidumping Investigation, 44 Fed. Reg. 43,567 (1979).

¹² Certain Fresh Winter Fresh Vegetables from Mexico: Antidumping Proceeding Notice and Tentative Determination of Sales at Not Less Than Fair Value, 44 Fed. Reg. 63,588 (1979).

¹³ Certain Fresh Winter Fresh Vegetables from Mexico: Final Determination of Sales at Not Less Than Fair Market Value, 45 Fed. Reg. 20,512 (1980).

¹⁴ North American Free Trade Agreement, Dec. 17, 1992, Can.-Mex.-U.S., 32 I.L.M.289.

¹⁵ NAFTA, *supra* note 14, pt. 3, ch. 11 (Investment).

¹⁶ Fresh Winter Tomatoes, 60 Fed. Reg. 16,883 (1995); see 19 U.S.C. §2251(d) (1994).

from increased imports that cause serious injury to the U.S. industry.¹⁷ The producers also sought provisional relief under Section 202(d) of the Act, which provides for provisional relief for growers of perishable agricultural products pending the completion of a full 180-day ITC investigation and the 60-day Presidential review period.¹⁸ An affirmative in provisional relief requires the ITC to find two conditions present: (1) on the basis of available information, increased imports of the subject article are a substantial cause of serious injury or threat thereof to the domestic industry, and (2) the serious injury is likely to be difficult to repair or cannot be timely prevented by final relief determined after a full 180-day ITC investigation.¹⁹

The ITC ruled in the negative in the provisional phase of the 1995 petition because of the way the industry was defined.²⁰ The petitioners sought relief for the winter fresh tomato industry, defined as those tomatoes marketed in the January to April market window. The ITC refused to recognize a seasonal industry, indicating that the case had to be decided on the U.S. industry that included all domestic production grown throughout the entire year.²¹ Petitioners withdrew the Section 201 petition following the outcome of the provisional relief phase, feeling the outcome of the provisional relief phase made it difficult to win an affirmative in the final determination of the Section 201 petition.²²

Imports increased again in the 1995-1996 season, and prices were again depressed. A Section 201 petition was filed with the ITC,²³ and an antidumping petition was filed with the U.S. Department of Commerce.²⁴ These petitions sought relief for the U.S. bell pepper and

fresh tomato industries, accepting the definition of a U.S. industry as defined by the ITC in the 1995 *Fresh Winter Tomatoes* case.²⁵ The petitions alleged that serious injury had been incurred by the U.S. bell pepper and tomato industries and the injury was caused by increased imports.²⁶

Mexican producers countered those petitions with claims that, although serious injury might have occurred to U.S. growers, injury was mainly in Florida and was caused by weather problems in Florida. They also contended that changes in market shares were a result of increased demand for Mexico's "higher quality tomatoes" and Florida's reluctance to improve their product quality with improved technology (VanSickle 1996, p. 5). The ITC decided in the negative in the Section 201 petition by a 4-1 vote in July 1996, indicating that increased imports were not causing serious injury to U.S. producers.²⁷ The petitioners chose to move forward on the antidumping petition on fresh tomatoes following the ITC negative determination on the Section 201 case because the standard for judging injury in an antidumping case is lower than that in a Section 201 case.

The Department of Commerce investigation in the antidumping case resulted in a preliminary determination in October 1996 that fresh tomatoes from Mexico were being, or were likely to be, sold in the United States at LTFV.²⁸ The DOC estimated dumping margins to average 17.5%. The case was stopped later in October 1996 when the DOC negotiated a suspension agreement with Mexican growers representing more than 88% of their volume.²⁹ The agreement established a floor price of 20.68 cents per pound for imported Mexican

¹⁷ 19 U.S.C. §2251.

¹⁸ *Id.* §2252(d).

¹⁹ *Id.* §2252(d)(1)(C.).

²⁰ *Fresh Winter Tomatoes*, ITC Pub. 2881, Inv. No. TA-201-64 (Apr. 1995) (prov.).

²¹ *Id.* at I-8 to I-14.

²² *Fresh Winter Tomatoes*, 60 Fed. Reg. 25,248 (1995) (termination).

²³ *Fresh Tomatoes and Bell Peppers*, 61 Fed. Reg. 13,875 (1996).

²⁴ *Fresh Tomatoes from Mexico*, 61 Fed. Reg. 15968 (1996).

²⁵ *Fresh Tomatoes and Bell Peppers*, 61 Fed. Reg. at 13,875.

²⁶ *Id.*; *Fresh Tomatoes and Bell Peppers*, 61 Fed. Reg. at 15,968.

²⁷ *Fresh Tomatoes and Bell Peppers*, ITC Pub. 2985, Inv. No. TA-201-66, at I-5, I-19.

²⁸ Notice of Preliminary Determination of Sales at Less Than Fair Value and Postponement of Final Determination: *Fresh Tomatoes from Mexico*, 61 Fed. Reg. 56,608 (1996).

²⁹ Suspension: *Fresh Tomatoes from Mexico*, 61 Fed. Reg. at 56,618-19.

fresh tomatoes and put the antidumping case on hold.³⁰ VanSickle (1997) noted that this agreement was to the benefit of growers and consumers in both Mexico and the United States.

U.S.–Canadian Trade in Greenhouse Tomatoes

On March 28, 2001, a group of six U.S. greenhouse growers of fresh tomatoes filed an antidumping petition³¹ with the ITC and the DOC, alleging that U.S. growers of greenhouse tomatoes were being injured, or threatened with material injury, by reason of imports of greenhouse tomatoes from Canada (ITC 2001).

In this case, the first issue to surface was the domestic like product issue. The statutory standard for like product is “like” or “most similar in characteristics and uses” and is determined on a case-by-case basis. The DOC and ITC can make separate determinations on like product. The DOC determines the subject merchandise to be investigated in the case (in this instance, greenhouse-grown tomatoes from Canada), and then the ITC determines what domestic products are like the imported merchandise. The DOC accepted the definition of product as greenhouse-grown tomatoes from Canada and the ITC used that definition in the preliminary ruling in determining that there was reasonable indication that the domestic industry was materially injured by reason of imports from Canada of greenhouse-grown tomatoes that were alleged to be sold in the United States at LTFV (ITC 2001, p. 2). A negative ruling at this stage would have required the ITC to determine that “(1) the record as a whole contains clear and convinc-

ing evidence that there is no material injury or threat of such injury; and (2) no likelihood exists that contrary evidence will arise in a final investigation” (ITC 2001, p. 3). In essence, a negative would require that clear and convincing evidence indicates lack of injury and that no other evidence is likely to surface contrary to that outcome.

Given this preliminary outcome at the ITC, the DOC and ITC launched separate investigations in the case to determine its merit. The DOC launched its investigation to determine whether the subject merchandise, imported greenhouse tomatoes from Canada, were being sold in the U.S. market at LTFV. At the same time, the ITC launched its investigation to determine whether the domestic industry of the like product was being injured.

Because this was an antidumping case brought by U.S. producers, the responsibility of the DOC was to determine whether the imported product was being sold in the United States at LTFV. The DOC used the constructed value approach for fair market value and estimated dumping margins ranging from 0 to 18.04% with an average for all others of 16.53% on imports of Canadian greenhouse tomatoes in the period of investigation.³² These results indicate that sales of greenhouse tomatoes from Canada averaged 16.53% below the constructed value cost of production.

In its preliminary assessment, the ITC determined the domestic like product to be greenhouse tomatoes, but reserved the right to re-examine this question during the final phase of the investigation. The ITC collected data for analysis of the facts related to injury in the case from publicly reported sources and from data submitted in response to the ITC questionnaires. Table 1 summarizes the data put forth by the ITC in consideration of the condition of the industry given the period of investigation of 1998–2000. The evidence indicates that the U.S. market for greenhouse-grown tomatoes had grown significantly over this period, from 401 million pounds in 1998 to 511 million pounds in 2000, a 27.5% in-

³⁰ Id. At 56,619.

³¹ A petition is required to be joined by producers who represent 25% of the total production of the domestic like product and 50% of the total domestic like product produced by that portion of the industry expressing support for the petition. If the petition does not establish support of more than 50% of the domestic like product, then the DOC must poll the industry or rely on other information to determine whether the required support exists. 19 U.S.C. §1671a(c)(4)(A) and (D) and §1673a(c)(4)(A) and (D).

³² Amended Canadian Greenhouse Tomato Dumping Margins, 67 Fed. Reg. at 15,528 (2002).

Table 1. Conditions in the Greenhouse-Grown Tomatoes Industry, 1998–2000

Item	1998	1999	2000
U.S. Consumption			
Quantity	401,452	458,844	511,871
U.S. Share	34.6	35.5	35.0
Canada Share	33.9	38.2	43.7
Other Imports Share	31.5	26.2	21.3
U.S. Imports from Canada			
Quantity	136,087	175,384	223,525
Value	102,897	121,801	163,878
Unit Value	0.76	0.69	.073
U.S. Producers			
Production			
Quantity	144,982	172,620	183,474
U.S. Shipments			
Quantity	138,813	163,059	179,068
Value	114,782	119,040	139,152
Unit Value	1.07	0.93	0.89

Notes: Quantities reported in 1,000 pounds; values reported in \$1,000. Unit values reported in dollars per pound.

Source: U.S. International Trade Commission, 2001, table III-2, p. III-3 and table IV-1, p. IV-2.

crease. The U.S. share of the market remained flat at 35%, while the share of the market controlled by Canada grew from 33.9% to 43.7%. The share of other import supplies appeared to have suffered the most from the increase in market share by Canada, with other import shares declining from 31.5% to 21.3%, although the quantity of other sources of imports remained flat at near 130 million pounds.

The quantity of imports from Canada of greenhouse-grown tomatoes increased from 136 million pounds in 1998 to 223.5 million pounds in 2000. The unit value on these imports decreased from 76 cents per pound in 1998 to 69 cents per pound in 1999. Unit values increased in 2000 to 73 cents per pound.

U.S. sales increased in volume over this same period, but far less than the increase in Canadian quantities, from 144.9 million pounds to 183.4 million pounds in 2000. Unit values for U.S. production declined from 83 cents per pound in 1998 to 73 cents per pound in 1999, recovering to 78 cents per pound in 2000. The number of workers and the total number of hours worked increased over this period for U.S. workers. Operating income for

firms responding to the ITC questionnaire, however, declined from a profit of \$2.9 million in 1998 to a loss of \$11 million in 2000. The ITC reported that profitability declined over the period of the investigation with 2 of 10 producers reporting losses in 1998, 8 of 11 reporting losses in 1999, and 8 of 14 reporting losses in 2000 (ITC 2002, p. 39).

In its final ruling, the ITC determined from the record they were able to assemble that an industry in the United States was not materially injured or threatened with material injury, and the establishment of an industry in the United States was not materially retarded by reason of imports of greenhouse tomatoes from Canada sold in the United States at LTFV.³³

The opinion of the Commissioners deciding this case revolved around the definition of the domestic like product and industry. Petitioners argued that the domestic like product in this case should consist of tomatoes grown

³³ The ITC voted 4-1 in the negative with Commissioner Lynn Bragg being the dissenting member (ITC 2002, p. 3).

in greenhouses only. Respondents to the petition argued that the domestic like product consists of all tomatoes grown for the fresh market, whether grown in greenhouses or in the field. In its evaluation of like product, the ITC considered physical characteristics and uses; interchangeability; channels of distribution; common production facilities, processes, and employees; and price. In considering these factors, the Commissioners deciding this case concluded, "Except with regard to manufacturing facilities, processes, and employees, there is substantial overlap between greenhouse and field tomatoes with respect to the like product factors" (ITC 2002, p. 9). The ITC reversed its earlier definition of the domestic like product as being only greenhouse tomatoes and expanded the scope to include all fresh tomatoes whether grown in greenhouse or in fields.

Commissioner Lynn Bragg dissented from the majority view, first arguing that the domestic like product included only greenhouse-grown tomatoes (ITC 2002, p. 34). Bragg's argument noted that three-quarters of purchasers confirmed that greenhouse and field-grown tomatoes are not interchangeable. She also noted the distinct production facilities, processes, and employees; unique channels of distribution; different characteristics and uses; producer and consumer perceptions indicating no interchangeability; and premium prices for greenhouse tomatoes.

The final view by the ITC of whether or not injury had occurred was driven by the determination on domestic like product. Imports of Canadian greenhouse-grown tomatoes represented only 4.6% of the U.S. market for all fresh market tomatoes in calendar year 2000, whereas greenhouse-grown tomatoes from Canada represented 43.7% of the U.S. market for greenhouse-grown tomatoes. The majority in this case ruled that the volume and the increase in volume of subject imports were not significant in absolute terms or relative to total fresh tomato production or consumption in the United States and, therefore had no significant adverse effect on the domestic fresh tomato industry. Commissioner Bragg's more narrow definition of the industry found the volume

and increase in volume to be significant, causing "significant price suppression and depression in the U.S. market even as apparent U.S. consumption of greenhouse tomatoes increased dramatically" (ITC 2002, p. 38).

Making Sense of It All?

U.S. antidumping law is intended to ensure fair trade by offsetting market distortions caused by foreign governments or foreign producers. Specifically, it targets price discrimination and sales below cost of production, imposing extra duties on goods from a particular country or group of countries if two conditions are met. First, it must be demonstrated that the subject merchandise is being sold in the U.S. market at LTFV. Second, the imports in question must be causing, or threatening to cause, material injury to domestic producers of a like product. The laws have been criticized because "in actual practice, the methods of determining dumping under the law fail, repeatedly and at multiple levels, to distinguish between normal commercial pricing practices and those that reflect government-caused market distortions" (Lindsey, p. 19). It might be easy to criticize the definition of dumping when considering agricultural products, given the seasonal and cyclical nature of the industries. It is not infrequent that producers sell their product at prices below the cost of production, but the expectation over the product cycle is that those losses will be offset by profits realized at different points of the market season or cycle. Without that expectation, no form of economic model can justify the practice.

A common measure of dumping used in agricultural cases is the constructed value cost of production measure. This is used after the DOC investigators determine that home market sales over the period of investigation are in sufficient volume below cost of production that recovery of all costs cannot be achieved within a reasonable time frame. It seems only reasonable that producers will rationally make production decisions on the premise that they will return a normal profit over the long run. What might keep those

producers from making these decisions is poorly managed government programs that mislead producers into making poor production decisions or poor management on the part of producers who control a significant portion of the industry. These laws allow domestic producers to seek relief from these poor decisions. It does not protect producers who are at a competitive disadvantage. Foreign producers who hold a competitive advantage in a product will be allowed to take additional market share without redress from the antidumping laws.

The greenhouse tomatoes from Canada case either was not as complicated as the ITC made it when determining the like product issue or was more complicated than the DOC made it in determining the subject merchandise. The criticism in this investigation comes by way of the analysis used to judge like product, which ultimately drove the decision on injury. The ITC used anecdotal evidence on physical characteristics and uses; interchangeability; channels of distribution; common production facilities, processes, and employees; and price. During the final hearing with the ITC, respondents supplied greenhouse-grown tomatoes and high-quality field-grown tomatoes as visual evidence that the two were like products.

Field-grown and greenhouse-grown tomatoes are similar in their outward appearance. Properly handled field-grown tomatoes can be visually attractive, appearing very similar to greenhouse-grown tomatoes. In the 1996 antidumping petition filed by U.S. growers against Mexican fresh tomatoes, Mexican respondents argued that vine-ripened tomatoes were distinctly different from mature green tomatoes. Mexico was primarily a shipper of vine-ripened tomatoes, and Florida was primarily a shipper of mature green tomatoes. The respondents centered their argument on pricing, consumer preference, and market channels. Evidence provided by respondents in that case indicated that vine-ripened tomatoes received higher prices than mature green tomatoes, consumers preferred vine-ripened tomatoes, and the retail market was controlled more by vine-ripened

tomatoes, whereas the food service sector was controlled more by mature green tomatoes. Petitioners in that case countered with arguments³⁴ that (1) outward appearance demonstrates the likeness in product (displaying vine-ripened and properly handled mature green tomatoes before the Commissioners); (2) there is significant overlap in production practices and in markets, with mature green tomatoes competing vigorously with vine-ripened tomatoes in the retail market; and (3) studies show no consistent consumer preference for one over the other. Petitioners also provided the study by Jordan and VanSickle (1995a) that demonstrated market integration between mature green and vine-ripened tomatoes (Jordan and VanSickle 1995a).

The arguments in the U.S.–Canada case were similar, except the petitioners were trying to limit the scope of the like product to a narrower definition of greenhouse tomatoes, whereas respondents were trying to expand the definition to include all fresh market tomatoes. The ITC recognized the differences in production practices between field-grown and greenhouse-grown tomatoes but believed the products to be interchangeable, even though retail members of the trade testified to the contrary.

Testing for Like Product

The foregoing analysis suggests the strong possibility for a different outcome had the definition of the “domestic like product” been greenhouse tomatoes instead of all tomatoes. It further suggests the need for a more objective and transparent approach to be used by the ITC in such determinations. The approach developed below follows from early work done on the integration of spatial markets (Lele; Ravallion). Rather than addressing *spatial* closeness of markets, market integration in the present context is addressed from the perspective of closeness of *characteristics* of commodities as evaluated by the market-

³⁴ Fresh Tomatoes from Mexico. ITC Pub. 2967, Inv. No. 731-TA-747 (prelim) (May 1996) at 6 to 11.

place. The basis of the determination of "like product" centers on the economic principle that if two or more goods are perfectly homogeneous, then all of their prices must move together perfectly. If a market consists of "like goods," the prices of these goods would also move together, although not perfectly. If the prices of goods in a market move independently, then the goods cannot be "like goods."

Jordan and VanSickle (1995a) used this approach to determine whether Florida and Mexican fresh tomatoes were integrated in the same market. They concluded from their study that Florida and Mexico were in fact integrated in the same market. Mexico was primarily a shipper of vine-ripened tomatoes and Florida was primarily a shipper of mature green tomatoes. Within the context of trade disputes, the conclusion reached by the authors suggested that the two products could be considered as "like product."

The specification used by Jordan and VanSickle (1995a) to determine whether two commodities, a and b, could be classified as "like products" in the same market was

$$(1) \quad P_t^a = \delta_{10} + \sum_{i=1}^l \beta_{1i} P_{t-i}^a + \sum_{i=0}^l \gamma_{1i} P_{t-i}^b + \sum_{i=1}^l \alpha_{1i} Q_{t-i}^a + \varepsilon_{1t}$$

$$P_t^b = \delta_{20} + \sum_{i=1}^l \beta_{2i} P_{t-i}^b + \sum_{i=0}^l \gamma_{2i} P_{t-i}^a + \sum_{i=1}^l \alpha_{2i} Q_{t-i}^b + \varepsilon_{2t}$$

where P_t^a and Q_t^a represent the price and quantity of commodity a in time period t , and likewise P_t^b and Q_t^b represent the price and quantity of commodity b in time period t . The length of the lags used in the analysis (assumed here to be l periods) can be determined through a series of statistical tests. The disturbances of the equations are assumed to have the following properties:

$$(2) \quad E[\varepsilon_{1t}] = E[\varepsilon_{2t}] = 0$$

$$E[\varepsilon_{it}\varepsilon_{js}] = 0 \quad \text{for } t \neq s, \quad \text{and}$$

$$\text{for } i, j = 1, 2$$

$$E[\varepsilon_{it}\varepsilon_{jt}] = \sigma_{ij}$$

It is readily seen that the parameters of each equation are identified. The above system can be estimated by any simultaneous equations estimator. However, given the cross-equation hypothesis tests to be examined, three-stage least-squares is a convenient estimation procedure with desirable properties. The following tests are conducted to determine whether the markets for commodities a and b are integrated (the commodities are "like product") or, if not, the extent to which the markets are separated (market segmentation). The null hypothesis is that the market is not integrated (i.e., it is segmented), whereas the alternative hypothesis is that it is integrated:

$$(3) \quad H_0: \quad \gamma_{1i} = \gamma_{2i} = 0 \quad i = 0, \dots, l$$

Hence, rejecting the null hypothesis in the above test implies that the products are integrated in the market and can be considered to be "like products."

A more general approach can be specified for an arbitrary number of commodities. In the presence of more than two commodities, however, the system is most easily seen in matrix form. Generalizing to n commodities, the equations can be written as:

$$(4) \quad \mathbf{Y}\Gamma + \mathbf{X}\mathbf{B} = \mathbf{E},$$

with the following definitions:³⁵

$$(5) \quad \mathbf{Y} = \begin{bmatrix} P_{11} & P_{21} & \cdots & P_{n1} \\ P_{12} & P_{22} & \cdots & P_{n2} \\ \vdots & \vdots & \ddots & \vdots \\ P_{1T} & P_{2T} & \cdots & P_{nT} \end{bmatrix}$$

$$\mathbf{X} = [1 \quad P_{-1} \quad \cdots \quad P_{-l} \quad Q_{-1} \quad \cdots \quad Q_{-l}]$$

$$\mathbf{P}_{-1} = \begin{bmatrix} P_{10} & P_{20} & \cdots & P_{n0} \\ P_{11} & P_{21} & \cdots & P_{n1} \\ \vdots & \vdots & \ddots & \vdots \\ P_{1,T-1} & P_{2,T-1} & \cdots & P_{n,T-1} \end{bmatrix}$$

³⁵ $\mathbf{1}$ is a T -element column of ones.

$$\mathbf{P}_{-l} = \begin{bmatrix} P_{1,1-l} & P_{2,1-l} & \cdots & P_{n,1-l} \\ P_{1,2-l} & P_{2,2-l} & \cdots & P_{n,2-l} \\ \vdots & \vdots & \ddots & \vdots \\ P_{1,T-l} & P_{2,T-l} & \cdots & P_{n,T-l} \end{bmatrix}$$

$$\mathbf{Q}_{-l} = \begin{bmatrix} Q_{10} & Q_{20} & \cdots & Q_{n0} \\ Q_{11} & Q_{21} & \cdots & Q_{n1} \\ \vdots & \vdots & \ddots & \vdots \\ Q_{1,T-1} & Q_{2,T-1} & \cdots & Q_{n,T-1} \end{bmatrix}$$

$$\mathbf{Q}_{-l} = \begin{bmatrix} Q_{1,1-l} & Q_{2,1-l} & \cdots & Q_{n,1-l} \\ Q_{1,2-l} & Q_{2,2-l} & \cdots & Q_{n,2-l} \\ \vdots & \vdots & \ddots & \vdots \\ Q_{1,T-l} & Q_{2,T-l} & \cdots & Q_{n,T-l} \end{bmatrix}$$

$$\mathbf{\Gamma} = \begin{bmatrix} 1 & \gamma_{12} & \cdots & \gamma_{1n} \\ \gamma_{21} & 1 & \cdots & \gamma_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ \gamma_{n1} & \gamma_{n2} & \cdots & 1 \end{bmatrix}$$

$$\mathbf{B} = [\mathbf{A}' \quad \mathbf{B}'_1 \quad \cdots \quad \mathbf{B}'_l \quad \Delta'_1 \quad \cdots \quad \Delta'_l]'$$

$$\mathbf{A} = [\alpha_1 \quad \alpha_2 \quad \cdots \quad \alpha_n]$$

$$\mathbf{B}'_1 = \begin{bmatrix} \beta_{111} & \beta_{211} & \cdots & \beta_{n11} \\ \beta_{121} & \beta_{221} & \cdots & \beta_{n21} \\ \vdots & \vdots & \ddots & \vdots \\ \beta_{1n1} & \beta_{2n1} & \cdots & \beta_{nn1} \end{bmatrix}$$

$$\mathbf{B}'_l = \begin{bmatrix} \beta_{11l} & \beta_{21l} & \cdots & \beta_{n1l} \\ \beta_{12l} & \beta_{22l} & \cdots & \beta_{n2l} \\ \vdots & \vdots & \ddots & \vdots \\ \beta_{1nl} & \beta_{2nl} & \cdots & \beta_{nnl} \end{bmatrix}$$

$$\Delta'_1 = \begin{bmatrix} \delta_{111} & 0 & \cdots & 0 \\ 0 & \delta_{221} & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & \delta_{nn1} \end{bmatrix}$$

$$\Delta'_l = \begin{bmatrix} \delta_{11l} & 0 & \cdots & 0 \\ 0 & \delta_{22l} & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & \delta_{nnl} \end{bmatrix}$$

The final matrix, \mathbf{E} , consists of the disturbance terms ε_{it} with $\mathbf{E}[\varepsilon_{it}] = 0$ for all equations $i = 1, \dots, n$ and all observations $t = 1, \dots, T$. The covariance matrix of \mathbf{E} is

$$(6) \quad \text{Var}[\mathbf{E}] = \begin{bmatrix} \sigma_{11} & \sigma_{12} & \cdots & \sigma_{1n} \\ \sigma_{21} & \sigma_{22} & \cdots & \sigma_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ \sigma_{n1} & \sigma_{n2} & \cdots & \sigma_{nn} \end{bmatrix} \otimes \mathbf{I}_T,$$

where \mathbf{I}_T is the T th-order identity matrix.³⁶

The earlier two equations specification is clearly a special case of this general specification. The $\mathbf{\Gamma}$ matrix represents the parameters relating current prices of goods to each other. The \mathbf{B}_1 matrix is the set of parameters for all prices lagged one time period; there are additional \mathbf{B}_l matrices up through \mathbf{B}_l corresponding to the number of lagged prices included in the equations. The Δ s, again with as many parameter matrices as there are lags in the quantity variables, are diagonal matrices since only own lagged quantities are included in each equation.

The specification assumes the variables are stationary. In the absence of stationarity, the most likely scenario is variables integrated of order 1. Then the notion of the price variables moving together over time, of course, would be dealt with in the context of cointegration. However, our experience with this approach for agricultural products has not found nonstationarity of the variables to be an issue. Similarly, we have found only first order lags of the variables to be of interest. In the above specification, that leaves only \mathbf{B}_1 among the \mathbf{B} matrices, and Δ_1 among the Δ matrices.

At first sight, examination of like product issues appears highly problematic with this model, given the many possible combinations. However, in the context of trade disputes involving like product issues, products can generally be separated into two groups of commodities. The question then becomes whether or not commodities in group I are like products with commodities in group II.³⁷ Assume for the moment that only first order

³⁶ The specification assumes no serial correlation that one would want to examine and adjust the specification accordingly.

³⁷ Typically, one of the two groups will consist of only one commodity: the one whose source is charged with dumping.

lags are relevant, as was suggested above. The hypothesis tests for market integration then involve particular elements of the Γ and

B_1 parameter matrices. Partitioning the Γ matrix with m commodities in group I and n commodities in group II,

$$(7) \quad \Gamma = \begin{bmatrix} 1 & \gamma_{12} & \cdots & \gamma_{1m} & \vdots & \gamma_{1,m+1} & \gamma_{1,m+2} & \cdots & \gamma_{1,m+n} \\ \gamma_{21} & 1 & \cdots & \gamma_{2m} & \vdots & \gamma_{2,m+1} & \gamma_{2,m+2} & \cdots & \gamma_{2,m+n} \\ \vdots & \vdots & \ddots & \vdots & \vdots & \vdots & \vdots & \ddots & \vdots \\ \gamma_{m1} & \gamma_{m2} & \cdots & 1 & \vdots & \gamma_{m,m+1} & \gamma_{m,m+2} & \cdots & \gamma_{m,m+n} \\ \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots \\ \gamma_{m+1,1} & \gamma_{m+1,2} & \cdots & \gamma_{m+1,m} & \vdots & 1 & \gamma_{m+1,m+2} & \cdots & \gamma_{m+1,m+n} \\ \gamma_{m+2,1} & \gamma_{m+2,2} & \cdots & \gamma_{m+2,m} & \vdots & \gamma_{m+2,m+1} & 1 & \cdots & \gamma_{m+2,m+n} \\ \vdots & \vdots & \ddots & \vdots & \vdots & \vdots & \vdots & \ddots & \vdots \\ \gamma_{m+n,1} & \gamma_{m+n,2} & \cdots & \gamma_{m+n,m} & \vdots & \gamma_{m+n,m+1} & \gamma_{m+n,m+2} & \cdots & 1 \end{bmatrix}.$$

The corresponding partitioned B_1 matrix is (dropping the third subscript since we are assuming a single lag):

$$(8) \quad B_1 = \begin{bmatrix} \beta_{11} & \beta_{12} & \cdots & \beta_{1m} & \vdots & \beta_{1,m+1} & \beta_{1,m+2} & \cdots & \beta_{1,m+n} \\ \beta_{21} & \beta_{22} & \cdots & \beta_{2m} & \vdots & \beta_{2,m+1} & \beta_{2,m+2} & \cdots & \beta_{2,m+n} \\ \vdots & \vdots & \ddots & \vdots & \vdots & \vdots & \vdots & \ddots & \vdots \\ \beta_{m1} & \beta_{m2} & \cdots & \beta_{mm} & \vdots & \beta_{m,m+1} & \beta_{m,m+2} & \cdots & \beta_{m,m+n} \\ \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots \\ \beta_{m+1,1} & \beta_{m+1,2} & \cdots & \beta_{m+1,m} & \vdots & \beta_{m+1,m+1} & \beta_{m+1,m+2} & \cdots & \beta_{m+1,m+n} \\ \beta_{m+2,1} & \beta_{m+2,2} & \cdots & \beta_{m+2,m} & \vdots & \beta_{m+2,m+1} & \beta_{m+2,m+2} & \cdots & \beta_{m+2,m+n} \\ \vdots & \vdots & \ddots & \vdots & \vdots & \vdots & \vdots & \ddots & \vdots \\ \beta_{m+n,1} & \beta_{m+n,2} & \cdots & \beta_{m+n,m} & \vdots & \beta_{m+n,m+1} & \beta_{m+n,m+2} & \cdots & \beta_{m+n,m+n} \end{bmatrix}.$$

Rejecting the null hypothesis that the elements of the upper right-hand blocks and lower left-hand blocks of Γ and B_1 are jointly zero implies that the markets between commodities in group I are integrated with the commodities in group II. The products in group I could be considered like products with the commodities in group II. Conversely, failure to reject the null hypothesis suggests that there is insufficient evidence to conclude that the commodities in the two groups are like products; their prices move independently, so they are segmented markets. Additional tests could be done to confirm that commodities within each group are integrated with each other. For example, rejecting the null hypothesis that the upper left blocks of Γ and B_1 are jointly zero would confirm that the mar-

kets for commodities within group I are integrated with each other.³⁸ However, the primary interest is presumably the first test between the contested commodity (group II) versus the questioned like products (group I).

Estimation of the above system can be done by any simultaneous equations estimator. Given the cross-equation restrictions to be tested, three-stage least squares is a reasonable choice for an estimator. By inspection, each of the equations in the system is identified via exclusion restrictions on the lagged quantity variables. The hypotheses are all linear and

³⁸ Because this test is conditional on the result of the first test, significance levels of the second and subsequent tests should be adjusted accordingly.

can be conveniently tested with a Wald test in most software packages.

A three-commodity application of the above specification was applied to the U.S.–Canada greenhouse tomato dispute. The group I commodities consisted of two types of field-grown tomatoes (vine ripened and mature greens); the group II commodity was greenhouse tomatoes. The analysis demonstrated unambiguously that the group I (field-grown) and group II (greenhouse) commodities were not integrated with each other. Conversely, the vine-ripened and mature green tomatoes were indeed integrated within the field-grown group.³⁹

Herein lies the inconsistency in market evaluation of like products relative to the ITC determination. The procedure in the earlier U.S.–Mexican case demonstrated that the vine-ripened and mature green tomatoes were indeed an integrated market. The ITC's decision in the case was consistent with this finding. The results for the U.S.–Canada greenhouse tomato case found that the greenhouse tomatoes were *not* integrated with field-grown tomatoes. However, the ITC chose to rule that the relevant market was *all* tomatoes, field-grown and greenhouse, obviously in conflict with the econometric results. The latter procedure has the advantage that the determination of "market" is as evaluated by private transactions in the market place.

Conclusions

The U.S.–Canada greenhouse tomato case does provide an interesting case study for application of trade law related to antidumping petitions filed in the United States. What is provided here is an overview of the process that was followed and the logic that was followed to test economic concepts. This overview points to two weaknesses in the procedures followed by the ITC in determining injury. The first and most obvious is the ap-

proach used to determine like product in these types of cases. The statutes identify those factors that should be considered by the ITC in determining like product but give no guidance on how to weight the various components into a determination or how to pass judgment when it is questioned. Empirical evaluation of the extent of market integration of commodities as illustrated with the above models is an alternative market-based approach that the ITC could utilize. An argument that might be posited against such treatment is the data requirements to conduct such tests. The ITC is given statutory authority, however, to collect data from the industry to help in judging injury. Such data collection could be mandated to include the necessary data to test for like product from all possible products that could be proposed as similar to the subject merchandise.

The second weakness suggested in this review points to the use of the COMPAS model for judging injury. The COMPAS model uses the Armington framework to estimate the effect of dumping on the domestic industry. Alston et al. pointed out the weaknesses in this model and demonstrated how it could lead to false conclusions in judging injury. To its credit, the ITC relies on more than the COMPAS model and encourages petitioners and respondents to submit economic analyses that demonstrate the level of injury to an industry from dumping. The breadth and complexity of cases that come before the ITC make it difficult for them to conduct these analyses internally.

The title of this paper implies that an economist makes sense of the U.S.–Canada tomato trade dispute. What has been accomplished is to provide an overview that might allow some trade economists to understand the process involved in determining the outcome in a trade dispute.

Although the paper might have failed at making sense out of the U.S.–Canada tomato trade dispute, it does raise a number of weaknesses in the decision framework used by the ITC.

³⁹ VanSickle, John J. "Integration and Behavior in the U.S. Market for Fresh Tomatoes." Petitioners Post-Hearing Brief. Greenhouse Tomatoes from Canada, Inv. No. 731-TA-925. March 25, 2002:6.

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