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Fresh Tomatoes from Mexico:

A Critical Analysis of the United States International Trade Commission and the Department of Commerce's Anti-Dumping Ruling

Introduction

On April 1, 1996, eleven groups of tomato growers from various locations across the United States (Florida, California, South Carolina, Georgia, Pennsylvania, Tennessee, and Virginia) petitioned to the Department of Commerce and the International Trade Commission alleging that due to Mexico exporting large quantities of fresh tomatoes—including common round tomatoes, cherry tomatoes, grape tomatoes, plum tomatoes, greenhouse tomatoes, and pear tomatoes—into the United States and selling them at LTFV (less than fair value), domestic tomato producers were unable to compete (USITC Publication 5003, 2019). They specified that, in the winter, for domestically grown tomatoes, the “minimum reference price for a 25 pound box is \$8.30,” while customers reported that they had been able to purchase Mexican grown tomatoes for “approximately four to five dollars per box” (USITC Hearing, 2019). This difference between prices suggested to domestic producers that dumping was taking place. Dumping occurs when a country or company exports a good at a price that is lower in the foreign importing market than in the exporter’s domestic market (Barone, 2021). By flooding the foreign importing market with goods priced drastically low, it often puts the importing nation’s competing firms out of business (Amadeo, 2021). According to the USITC and DOC, dumping is an unfair trade practice and is punishable by anti-dumping duties being applied to pertinent goods.

In this particular case, the petitioners asserted that both the product from the United States and the product from Mexico were identical in “look” and “quality,” suggesting that customers would be equally willing to consume either tomato (USITC Publication 5003, 2019). Thus, they contended that the difference in consumption could be accounted for by the price difference (USITC Publication 5003, 2019). The domestic tomato growers alleged that this discrepancy between prices led to “depressed sales values” and “low operating profits” (USITC Hearing Transcript, 2019) for domestic tomato producers, and cited that from 2005 to 2019 the acres farmed for tomatoes in the United States decreased from 8,400 to 6,500 (a 22.6 percent decrease) and the average number of employees at these farms decreased from 2,400 to 1,600 (a 33.3 percent decrease) (USITC Hearing Transcript, 2019). The domestic growers argued that the decline in acres farmed and people employed was not due to reduced demand for tomatoes, but instead because their share of the tomato market was usurped by Mexican tomato producers: in 1996, the domestic producers supplied 65 percent of tomatoes to the domestic market, and the Mexican producers supplied 32 percent of tomatoes, but by 2018, the domestic producers only supplied 39 percent of tomatoes to the domestic market, and the Mexicans supplied 55 percent of tomatoes (USITC Publication 5003, 2019).

The respondents, who opposed an anti-dumping duty being imposed on Mexican tomato exporters, consisted of both Mexican and American producers. One respondent, Thomas Wilner of Shearman & Sterling, testified that Mexican tomato producers had “spent billions of dollars investing in technology to convert their growing from open field to greenhouses, hot houses, shade houses, protected agriculture,” which contrasted with domestic producers, who still had “90 percent of their production in the open field” (USITC Hearing Transcript, 2019, pg. 16). Wilner proposed that these differences in tomato growing technique resulted in variations in the

types of tomatoes produced domestically and in Mexico. He also argued that these differences were what had caused the reduction in the domestic producers' market share, citing that the market had "shifted away from the open field gas greens to the protected agriculture product" (USITC Hearing Transcript, 2019, pg. 16). Respondent Lance Jungmeyer from the Fresh Produce Association of the Americas also asserted that major domestic tomato producers had "made the business decision to grow, import and distribute Mexican tomatoes" (USITC Hearing Transcript, 2019, pg. 174). Jungmeyer claimed that the domestic producer's decision to engage in the "importation and distribution of Mexican tomatoes" was "one of the only things keeping the FTE marketing companies in the game," and therefore, that the importation of Mexican tomatoes were not harming domestic companies, but actually helping their business (USITC Hearing Transcript, 2019, pg. 169).

Despite the considerable price differential between domestic grown and Mexican grown fresh tomatoes, we do not agree with the USITC and DOC's decision that the low price of Mexican tomatoes resulted from dumping. Instead, the price difference is driven by Mexico's low-skill abundant labor force, which is well suited for agricultural work, their comparative advantage in tomato production, due to widespread utilization of protected growing techniques, their long history of tomato production, which has allowed them to experience economies of scale, and their government's favorable policies, such as allowing the use of effective but dangerous pesticides. First, we provide an overview of tomato production in the United States and Mexico, showing the significance of the industry in each country. Then, we analyze three trade models to determine if the price differential can be explained without dumping. Finally, we explore reasons that the domestic tomato industry could have experienced material injury other

than the lower cost of Mexican tomatoes, looking at various government policies across both the United States and Mexico.

Overview of Tomato Production in the United States and Mexico

In 2019, the United States was the 8th largest exporter of tomatoes in the world, accounting for 3.2 percent of worldwide tomato exports (Workman, 2020). Although the United States still plays an important role in the global market for tomatoes, since 2000, the production of tomatoes in the United States has been on the decline; the total production of fresh tomatoes dropped from “3.9 billion pounds in 2000 to 2.7 billion pounds in 2015,” a decline of over 30 percent (Guan, Biswas, Wu, 2018). According to the University of Georgia’s Commercial Tomato Production Handbook, due to their consistently mild climates, Florida and California are well suited for tomato production, and therefore they lead the United States in the quantity of tomatoes produced (Guan, Biswas, Wu 2018). However, in other states that are major producers of tomatoes, such as Georgia, Indiana, and South Carolina, low temperatures make outdoor tomato production impossible during the winter months (Kelley, Boyhan, 2017). These undesirable weather conditions result in a high demand for greenhouse facilities, specifically in those states (Guan, Biswas, Wu, 2018). Due to the sensitivity of tomatoes to environmental factors such as temperature and soil quality, maintaining high standards for tomatoes is a labor intensive pursuit (University of Georgia Extension, 2017).

The economic impact of tomato exports from Mexico is significant: Mexico was the world’s largest exporter of tomatoes in 2019. Tomatoes account for 99.7 percent of Mexican vegetable exports, which, in 2019, equated to a total value of two billion USD (University of Georgia Extension, 2017). In addition to the large quantity of tomatoes that are exported from

Mexico, the rate at which Mexico's exportation of tomatoes has increased is also significant (Osoyo, 2021). As noted in the United States Department of Agriculture's annual report on tomatoes, when the North American Free Trade Agreement (NAFTA) was created in 1995, Mexican tomato exports were "valued at a mere \$406 million," indicating that the value of Mexico's tomato exports increased by nearly 393 percent in the 25 years following the adoption of NAFTA (USDA, 2021). To generate this level of production, Mexican farmers produce tomatoes year round, shifting which state produces the most tomatoes depending on the time of year as a way to adapt to seasonal weather variations (Guan, Biswas, Wu, 2018). Similarly, Mexican tomato growers have invested in technologies such as "drip irrigation systems, insect/anti-aphid protection, and systems to control light and air," advancements that help ensure that the greatest possible proportion of grown tomatoes are suitable for exportation (USDA, 2021). Furthermore, relative to the United States, Mexico is a low-skill labor abundant country, which prepares them for success in growing tomatoes, a low-skill labor intensive good (USDA, 2021).

Explanations for Price Difference Other Than Dumping

Heckscher-Ohlin Model

The first trade model that we consider to explain the price differential is the Heckscher-Ohlin model. This model predicts the pattern of trade between two countries based on differences between the factor endowments of those countries. If it is less expensive to produce tomatoes in one country relative to the other, and if this production cost difference is due to a difference in factor endowments, then the Heckscher-Ohlin model predicts the country which is relatively more abundant in a particular factor will more cheaply produce—and thus export—the

good whose production is intensive in that factor. In the following section, we explore three differences in factor endowments to see if any could explain the difference in price of tomatoes.

Climate

The first factor endowment that we consider between the United States and Mexico is the climate of each country. Tomatoes require a particular environment in which to grow, and ideally, tomatoes should be grown in environments with temperatures ranging from 70-85 degrees Fahrenheit during the day and no lower than 65 degrees Fahrenheit at night (University of Georgia Extension, 2017). A consistently mild, sunny climate with minimal, evenly-distributed rain is ideal for tomato growth.

Although both the southern United States and the majority of Mexico experience sufficiently mild climates compared to other areas of the world, neither country has a naturally faultless climate for tomato growth. In states such as Florida and California of the United States, prolonged sunshine yields suitable conditions throughout much of the year. Other states, however, such as Georgia, Tennessee, and South Carolina, do not have climates that are mild enough for year-round tomato production. Despite having enough sun and favorable temperatures, rainfall amounts are high in all of these states besides California, leaving crops susceptible to mold and growth of other harmful organic matter (Estabrook, 2011). Mexico has a similar climate to that of the southern United States. The dry season stretches from November to May, bringing sun and mild temperatures. The rainy season lasts from June to October (Live and Invest Overseas). While temperatures do not fluctuate between the dry and rainy seasons, dramatic differences in rainfall and sun amounts do not provide a steady environment for tomato growth and production. Because the climates of the two countries are extremely similar, it is

unlikely that a difference in climates can explain a difference in production costs, and thus prices, for tomatoes between the United States and Mexico.

Soil

The second factor endowment that we consider is each country's soil. As much as climate impacts the growth of tomato plants, the ground in which the plants grow is just as crucial for providing necessary nutrients and support. According to the *Commercial Tomato Production Handbook* from the University of Georgia Extension, fresh tomatoes "grow optimally in deep, medium textured sandy loam or loamy, fertile, well-drained soils."

Similarly to climate, there are no large distinctions in the soil of the United States and Mexico that could explain the difference in costs of production, and thus price. In Florida, the state in which the main petitioners are located for this case, the soil has no nitrogen and cannot sufficiently hold moisture (Estabrook, 2011). To provide nutrients for the growing tomato plants, the soil must be heavily fertilized. The soil itself in Florida is mostly sand, "no more nutrient rich than the stuff vacationers like to wiggle their toes into on the beaches of Daytona and St. Pete" (Estabrook, 2017) and cannot provide a suitable growing environment for tomatoes without arduous modifications. Mexican soils tend to be too mountainous and arid for crops; only one-fifth of the land can actually be made arable (Johnson, 2009). 65 percent of the soils are shallow and have a low crop yield, and 25 percent of farmable land must be sustained through regular irrigation (Améndola et. al. 2012). As a result, neither the United States nor Mexico have a comparative advantage in terms of local soils that could lead to the price difference observed between tomatoes grown in each country.

Labor

The third and final factor endowment that we consider is labor. It is this factor endowment that provides us with key insights that indicate the reason for a difference in prices between tomatoes produced in the United States and in Mexico. Tomato production is a labor-intensive industry—much of the production and harvesting is still fully completed by hand. While each stage of the harvesting process requires highly specialized labor, most of this labor is low-skilled.

Mexico is abundant in low-skilled labor relative to the United States. This abundance stems from a high population growth rate in the mid-1970s. Individuals born in these years reached working age through the late 1990s, leading to a substantial increase in the workforce (OECD Skills Strategy Diagnostic Report, 2017). The Heckscher-Ohlin Theorem of the Heckscher-Ohlin model states that the country that is abundant in a factor can more cheaply produce the goods whose production is intensive in that factor. Because Mexico is more abundant in low-skilled labor than the United States and tomato production is a low-skilled labor-intensive industry, Mexico can effectively produce fresh tomatoes at a lower cost than the United States. With laborers comes the requirement to pay wages. Mexico, in addition to having more laborers than the United States, also has lower wages. Of the Organisation for Economic Co-operation and Development (OECD) countries, Mexico has the lowest annual average wage, nearly four times lower than the average wage of the United States, a trend that has held constant for the last 20 years (OECD, 2019).

There are two additional factors related to labor that could explain the lower cost of production of tomatoes in Mexico. The first is that of the OECD countries, “[w]orkers in Mexico work the longest hours...around 27 percent higher than the OECD average...25 percent higher

than the United States” (OECD, 2019). Working longer hours could increase productivity overall, leading to a larger amount of tomatoes produced, driving down the price that the tomatoes are sold for in global markets. The second factor is the mobility of the Mexican labor force. Due to the lack of required skills in order to complete agricultural jobs, many Mexican workers are able to move around and work at different tomato farms depending on the season and demand for workers across these farms (OECD, 2019). Laborers are able to go where they are needed the most by tomato producers, increasing production overall.

Through our analysis of the Heckscher-Ohlin model and differences in factor endowments between the United States and Mexico, we have shown that differences in labor forces between the two countries provide an alternative explanation for the differences in price besides the dumping claims brought by the case petitioners.

Ricardian Model

The second trade model that we consider is the Ricardian model. The Ricardian model predicts that the pattern of trade between two countries is the result of differences in technological productivity between two countries. The country with better technology can more efficiently produce a good, lowering the production costs associated with that good. With lower costs of production comes the ability to sell goods at a lower price point. For tomato production, relevant technologies include greenhouses and soil additives. The differences in tomato production technology between the United States and Mexico can help account for the lower price of fresh tomatoes from Mexico.

In the United States, much of tomato production is still done in the open field, but in states with less ideal climates for growing tomatoes, greenhouses and other protected-culture

technologies are commonly used to help extend the growing season and make production more viable (USDA, 2019). These greenhouses are concentrated in Nebraska, Minnesota, New York, and other states that are not traditional market leaders in tomato production (USDA, 2019). In some states without easy access greenhouses, like Georgia, producers must rely on growers with greenhouses to produce their transplants (University of Georgia Extension, 2017). The scarcity of greenhouses across the United States makes it difficult for farmers to be able to maintain year-long production. In lieu of greenhouses, plastic mulch is widely used in the production of tomatoes in the Southeast region of the United States, and its benefits include promoting early crops, reducing weeds, and maintaining the soils' moisture (University of Georgia Extension, 2017). Plastic mulch is often used in conjunction with drip irrigation, a type of micro-irrigation that is designed to conserve soil nutrients and to minimize waste by delivering water directly to the plant roots (Green Thumb, 2020). While plastic mulch enhances tomato yields, it costs tomato growers additional expense, as they have to pay yearly for new mulch, as well as the disposal of old mulch.

In Mexico, high-tech greenhouses, shade houses, and tunnel cultivation systems are commonly used to increase the supply of tomatoes, as they allow the climate to be strictly controlled (USDA, 2016). These technologies increase yields, save significant amounts of water, and reduce the use of pesticides, cutting down on other costs that tomato producers have to pay (Pavlovich-Kochi, 2019).

Mexico's abundance of subsidized, highly developed greenhouses promote longer growing seasons and higher yields (Guan, Biswas, Wu, 2018). The United States' lack of widespread access to such technologies are due to the fact that the United States government only subsidizes five crops (corn, soybeans, wheat, cotton, and rice) all of which are not grown in

greenhouses (Amadeo, 2020). Additionally, the United States' costly investments in plastic mulch lead to higher production costs than those faced by Mexican tomato producers. Through this analysis of differences in technology, based on the Ricardian model, Mexico is better suited to the production and exportation of tomatoes.

New Trade Theory: Economics of Scale

The third model we consider is New Trade Theory, and the possibility that tomato production is impacted by external economies of scale. The models of New Trade Theory suggest that differences between countries are not the only thing that drives trade. For example, knowledge spillovers, specialized suppliers, and historical accidents are a few mechanisms by which one country could gain an advantage in production over another, potentially resulting in external economies of scale. Mexico's early entrance into the tomato market, when compared to the United States, gave Mexico the opportunity to benefit from external economies of scale. While tomatoes were domesticated and cultivated in Mexico by 500 BC, it was not until the mid-1800s that limited numbers of tomatoes began to be produced in the United States, due to Americans' long held belief that tomatoes were poisonous (University of Georgia Extension, 2017). This historical accident allowed Mexico to gain footing in the global tomato market much earlier than the United States, and more quickly perfect the process of tomato production, leading to Mexico's comparatively higher productivity and lower costs of production. For example, in 2020, 3.33 million tons of tomatoes were produced in Mexico, and 11.3 million tons were produced in the United States (Karst, 2020). Considering that the United States is five times larger than Mexico, when controlling for size, Mexico produced more tomatoes relative to the United States. This suggests that Mexico has reached external economies of scale, thereby

allowing them to have lower production costs and sell their tomatoes at a lower price than the United States.

Explanations for Material Injury Other Than Dumping

Government Policies

While the petitioners in this case claim that their incurred material injury is a direct result of the lower prices of Mexican produced tomatoes, there may be other potential explanations for the material injury that domestic tomato producers faced. While these alternative explanations may in turn affect the price of tomatoes in both countries, they do not fall into the main trade models analyzed in the previous sections. This next section explores various government policies in the United States and Mexico that could account for the domestic tomato producers' loss of market share around the time of the filing of this case.

The Mexican government has enacted several policies that create favorable conditions for the production of tomatoes. According to the United States Department of Agriculture's Foreign Agricultural Service (USDA-FAS), the protected land holding designated specifically for the growing of tomatoes in Mexico was 34,595 acres in 2012 (Guan, Biswas, Wu, 2018). In addition to preserving certain parcels of land for tomato production, the Mexican government further encourages the farming of tomatoes through the continued enactment of their Strategic Project for Protected Agriculture, a program which, since 2009, has "provided subsidies for various protected production practices, including greenhouses and high tunnels" (Guan, Biswas, Wu, 2018). These subsidies, earmarked for the installation of new agricultural technologies, can cover up to half of the total cost, lessening the financial burden for many farmers, and making it possible for even smaller producers to invest in technology created to increase crop yields (Guan,

Biswas, Wu, 2018). Additionally, Mexico lacks a national system of unemployment benefits, and, as a result, according to the OECD's book, *Higher Education in Mexico: Labour Market Relevance and Outcomes*, those who are unemployed "cannot afford a lengthy search" (OECD, 2019). The incentive to quickly secure a new job results in unemployed workers being unable to spend the time searching for a job that best suits their education and experience levels, and this suggests that more workers will settle for jobs that consistently have openings, like positions in the agricultural industry. Mexico also has lenient labor laws concerning child laborers, and according to a 2019 report published by the Bureau of International Labor Affairs, in Mexico, "3.1 million children between the ages of 5 and 17 engage in child labor," which includes undertaking "dangerous tasks in agriculture including in the production of chile peppers, coffee, sugarcane, and tomatoes" (Bureau of International Labor Affairs, 2019). The availability of underage workers to the Mexican agricultural industry allows tomato producers to keep their labor costs low, because many child laborers are underpaid. Also, because there is an abundance of underage laborers, it enables the producers to have a steady stream of workers, and therefore, not have to invest resources in searching for people willing to work on their farms.

In contrast to Mexico, the United States' tomato industry, specifically the farms based in Florida, has been subject to a host of quality control measures that call for increased diligence throughout the production process (Florida Tomatoes, 2008). The Florida Tomato Committee's Food Safety Program states that Florida has incorporated policies called Good Agricultural Practices (GAPs) and Best Management Practices (BMPs), which specify that there be "mandatory government inspection" of all facilities, and "audit[s] for tomato handling, production and packaging" processes (Florida Tomatoes, 2008). The obligatory nature of these protocols compel Floridian tomato growers to dedicate resources to ensuring that their facilities

are in line with new standards. This additional input cost adds to total costs of production, potentially driving up the prices of Florida grown tomatoes. Florida's tomato producers have also been subject to increased regulation surrounding treatment of and compensation for their employees (Florida Tomatoes, 2008). The Coalition of Immokalee Workers, specifically through their Fair Food Program, have rallied for higher wages for employees of tomato farms, resulting in higher input costs for tomato producers (Florida Tomatoes, 2008). Furthermore, the Florida government's banning of methyl bromide, a fumigant which was utilized on farms to stave off pests that compromised tomato crops, has been positively correlated with a decline in tomato yield (United States Environmental Protection Agency, 2018). Without methyl bromide, Florida farmers have had to rely on less effective pesticides, prompting lower quantities of tomatoes that meet the quality standards being produced (Guan, Biswas, Wu, 2018).

The United States' immigration policies also impact the efficiency of the domestic tomato production process. The Trump Administration imposed regulations surrounding who could immigrate into the United States, making it more difficult for agriculture workers from Mexico to obtain H-2A visas, applicants for which "face fewer barriers, delays and regulations" (Mohan, 2017). Additionally, of the immigrant farm workers who are already in the United States, many are believed to be "lying low in fear of deportation" (Mohan, 2017). Combining the lack of immigrant workers who are available and willing to work farming agriculture with the fact that "non-immigrant Americans are not eager to pick crops" has led to a labor shortage that prevents domestic farmers from cultivating as many crops as they have the potential to (Mohan, 2017). This lack of supply of domestically grown tomatoes leads to an increase in the price of tomatoes, making the Mexican grown tomatoes more appealing to consumers because of their lower price point.

Conclusion

The price differential between domestic grown and Mexican grown fresh tomatoes is not driven by Mexico dumping tomatoes into the United States. Through our analysis of various trade models, we have shown that the price difference most likely resulted from causes other than dumping. Mexico's abundance of low-skilled laborers, superior protected agricultural technologies, and historical advantage due to entering the tomato market before the United States all indicate that Mexico has the potential to produce fresh tomatoes at a lower cost. Combining these low production costs with Mexico's higher productivity allows Mexico to sell fresh tomatoes at a lower price. While we agree that domestic tomato producers experienced material injury, government policies that foster production in Mexico, as well as policies that drive up production costs in the United States, are more likely to cause the material injury experienced by domestic growers rather than the lower price of Mexican tomatoes alone.

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