Domestic Product Market Impacts of Politically Motivated Foreign Tariffs

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Abstract: We examine the effects of foreign tariffs on the US product market. Using the recent US whiskey tariffs that were implemented as a result of political strife, we find that, on average, US whiskey producers decrease US product prices following a sharp increase in foreign tariffs. However, in cross-sectional analyses, we find that producers implement strategic product pricing in response to the foreign tariffs, increasing prices in production states (Kentucky and Tennessee) and states with larger whiskey drinking populations. Taken together, these findings suggest that the US product market is significantly impacted by foreign trade restrictions.

Key Words: tariffs; product prices, non-income taxes

Data Availability: data collected from the indicated sources

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1. Introduction

A tariff is a tax that is levied by the government on goods and services. Customarily, tariffs serve as a policy tool to protect domestic producers from foreign trade practices (Amiti, Redding, & Weinstein, 2019; Horst, 1971; Johnson, 2016). However, the past five years have been plagued with high profile trade wars, and countries appear to implement tariffs as a political scheme without fully considering the consequences of restrictive trade policies (Burd, 2023; Caselli, Fracasso, & Schiavo, 2021; Cavallo, Gopinath, Neiman, & Tang, 2021; Fajgelbaum, Goldberg, Kennedy, & Khandelwal., 2020; Flaaen & Pierce, 2020; Huang, Lin, Liu, & Tang, 2023). Accordingly, the relationship between changes in trade policies and outcomes on domestic product markets continues to be an important topic for both researchers and policymakers (Pierce & Schott, 2012). Though researchers have made strides in data methods and identification in regard to examining tariff outcomes in various settings (Amiti, Redding, & Weinstein, 2019; Burd, 2023; Cavallo et al., 2021; Flaaen, Haberkorn, Lewis, Monken, Pierce, Rhodes, & Yi, 2021; Handley, Kamal, & Monarch, 2020; Huang et al., 2023; Pierce & Schott, 2012), the important question pertaining to how *foreign* tariffs impact *US domestic* product markets remains open. This paper uses a unique setting to examine how foreign tariffs, implemented as a retaliatory action in a recent political strife, impact domestic producers.

In 2018, as a retaliatory measure to the US's newly imposed steel and aluminum tariffs, China, Mexico, and the European Union (EU) implemented 25% tariffs and Canada implemented 10% tariffs on US whiskey and bourbon (Reuters, 2019). These tariffs served as a strategic political punch to Kentucky, which is represented by Senator Mitch McConnell, the top Republican in the Senate. Whiskey produced in Kentucky and Tennessee accounts for over 86 percent of whiskey sales in the US, and these tariffs resulted in US whiskey producers getting caught in the political

crossfire (Pomranz, 2022). Brown-Forman, the maker of Jack Daniel's Tennessee Whiskey, estimated that the foreign tariffs would impact the company's financial results by $125 million as their US whiskey exports to the EU declined by almost 30% (Ekblom, 2019; Lucas, 2020). As a result of the added tax, US whiskey exports were estimated to decrease by 20% between 2018 and 2021 (Japhe, 2023). This followed an extended period of industry growth during which Kentucky bourbon exports increased by 98% between 2010 and 2017. The US did not enact retaliatory tariffs on foreign whiskey imports until October 2019.

Our interest lies in understanding US product market responses to foreign export tariffs. The retaliatory foreign tariffs on the US whiskey industry present a robust empirical setting to examine the impact of foreign tariffs on US prices and strategic producer actions. First, these tariffs are quasi-exogenous and uncorrelated with anticipatory effects in either the home country or foreign country. The tariffs were not implemented as an economic tool to protect an industry from foreign business practices, but rather as a ploy in a political dispute. Second, the targeted US whiskey tariffs allow us to examine the impact of foreign tariffs on domestic prices without a parallel change in domestic competition via import tariffs, because the US did not levy retaliatory tariffs on foreign spirit imports until 2019. This is unique compared to the Section 301 tariffs on Chinese imports, which quickly escalated into a trade war with tariffs being applied on both imports and exports. Third, Kentucky Bourbon and US Bourbon and Whiskey are differentiated products. Though previous research has studied *export* prices in response to foreign tariffs, these results 1) apply to undifferentiated commodities (i.e., agricultural products) and 2) do not examine the impact on *domestic* prices (Cavallo et al., 2021; Nti, Kuberka, & Jones, 2019; Sabala & Devadoss, 2019). We expect our results to be generalizable to a range of products with similar

price elasticities (Andreyeva et al., 2010), especially differentiated products in which a consumer portrays taste preferences.[1]

For our primary empirical strategy, we acquire Nielsen Retail Scanner Data, a subscription-based dataset that allows us to analyze granular universal product code (UPC) price level data at the store level, a strategy that would not be possible with consolidated financial data that is not released in the frequency needed. This price data is reported weekly and allows for analysis related to both product sale location and brand. With this detailed dataset, we are able to identify a clear treatment and control group, utilizing whiskey produced in the US as a treatment group and imported foreign whiskey as a control group. This method of identification allows us to compare products facing similar economic conditions.

We begin our analysis by investigating whether increases in foreign tariffs are associated with product price changes for US consumers. Prior literature has shown that foreign taxes impact domestic producers. For example, reductions in foreign income taxes have been found to increase competition and decrease market power for US producers (Kim, Nessa, & Wilson, 2021). Though income taxes represent a significant portion of a producer's bottom line, non-income taxes also attribute to an important aspect of producer tax and operating considerations (Blouin, Robinson, & Seidman, 2018; Drake, Hess, Wilde, & Williams, 2022; Dyreng & Maydew, 2018; Robinson, 2012). We posit that when a foreign country implements a significant *increase* in a tariff (i.e., non-income tax) impacting US goods, this has a significant impact on US producer's domestic product market.

Using a difference-in-differences model we find that, on average, US whiskey producers impacted by the foreign tariffs *decrease* their prices for US consumers, suggesting that an increase

[1] Products with similar US price elasticity estimates include soft drinks and cereal (Andreyeva et al., 2010).

in local supply causes downward price pressure. However, we also provide new evidence that this straightforward relationship appears to be more nuanced than expected. Producers significantly *increase* prices in the primary production states of Kentucky and Tennessee, and the degree of price change varies based on the state-level popularity of whiskey. This evidence aligns with recent literature which finds that consumer preferences for locally produced products can result in less price-elastic demand, and suggests producers make strategic pricing decisions (Jarrett D. Hart, 2019; Zare, Asgari, Woods, & Zheng, 2020). Thus, producers appear to take advantage of demand inelasticity in response to the change in foreign demand upon implementation of the tariffs (Gale, 1955; Härdle, Hildenbrand, & Jerison, 1991; Leszczyc & Rao, 1990).

In additional tests, we confirm that our results are not driven by a change in the foreign whiskey product market by using an alternative control group of rum, vodka, and tequila prices and find similar inferences. Additionally, we provide evidence that our results persist when high price products are excluded from the analysis, alleviating concerns that our results are driven by the significant increase in the prominence of high-end US whiskey over the past few decades. Further, we provide graphical evidence that the parallel trends assumption holds for our difference-in-difference research design. We also consider changes in sales volume, and we provide evidence that, on average, sales volume significantly increased for U.S. producers, implying that they were able to make up a portion of their lost revenues via price changes (Gale, 1955; Härdle et al., 1991). This is not surprising because previous literature has found that alcohol portrays demand elasticity with price, suggesting that increases in alcohol prices due to taxation can serve as a tool to decrease alcohol consumption (Pogue & Sgontz, 1989; Wagenaar et al., 2009). With this in mind, we would expect U.S. producers to experience increases in demand with price decreases.

In our final set of analyses, we use Kantar data to examine whether foreign tariffs impact US producers' domestic marketing decisions. Kantar is an industry leading provider of media-tracking data that systematically monitors and reports details related to producers' advertising spending.[2] We find compelling evidence that while, on average, producers decrease their local advertising spending, they do not decrease their spending in Kentucky and Tennessee. This suggests that producers also exploit demand inelasticity via strategies in marketing (Cohen, Mashruwala, & Zach, 2010; Hanssens, Parsons, & Schultz, 2001; Leszczyc & Rao, 1990).

Considering ongoing political tensions between the US and foreign countries, our study contributes to our understanding of how foreign trade restrictions influence US product markets. Understanding how US producers react to foreign tariffs in their local market provides important evidence to research examining domestic impacts of tariffs and trade-wars (Amiti et al., 2019, 2020; Burd, 2023; Cavallo et al., 2021; Fajgelbaum, Goldberg, Kenndy, & Khandelwal, 2020; Flaaen & Pierce, 2020; Froymovich, Konchitchki, & , Robinson 2023; Horst, 1971; Huang et al., 2023; Kreinin, 1961; Nti et al., 2019; Amiti, Kong, & Weinstein, 2021). Though empirically our setting is limited to US whiskey, the results are generalizable to differentiated products, and provide new evidence on strategic pricing decisions in reaction to tax changes beyond that previously provided regarding tariffs and undifferentiated product price and consumption outcomes (Cavallo et al., 2021; Nti et al., 2019; Sabala & Devadoss, 2019). Although our work suggests that producers on average decrease prices in response to a quasi-exogenous increase in foreign tariffs, impacted producers appear to take advantage of variation in demand elasticities to implement the most advantageous pricing strategies in the face of declining financial performance. These findings should be of interest to policymakers and producers as they seek to trade off the

[2] We access Kantar via Advertising Insights.

costs of heightened political tensions and trade disputes, which continue to remain a significant operating limitation for a number of domestic producers. Though Canada and Mexico revoked their tariffs on US whiskey in 2019, with the EU following suit in 2021, the tariffs continue to be an ongoing obstacle in the industry. As of December 2023, the threatened 50% tariff levied on US whiskey imports by the EU has been suspended until March of 2025 (Gomez, 2023).

2. *Setting and Hypothesis*

2.1 Bourbon and Whiskey Tariffs

A tariff is a tax that is applied by a government on specified classes of goods and services imported from another country. Tariffs primarily serve as a policy tool to 1) protect domestic producers from foreign exporters and 2) raise revenue for the government imposing the tariff on imports. Logistically, when a country implements a tariff, once an item has arrived in customs, an importer remits a tariff payment to the government that is calculated based upon the value of the item (plus freight and insurance) multiplied by the specified tariff rate. Tariff rates are typically applied upon World Trade Organization most favored nation status or trade agreements. Data from the World Bank reports that in 2017, the average applied mean weighted tariff rate on all products across the world was 2.6%. However, recent years have seen an increase in significantly large protectionist tariff rates.

In March 2018, the Trump administration approved controversial 25% tariffs on steel imports and 10% tariffs on aluminum imports, sparking worries over a looming trade war and deteriorating relationships with global allies (Schlesinger, Nicholas, & Radnofsky, 2018). The former President invoked the tariffs under a law allowing presidents to decrease imports deemed a national security threat. The announcement came following a study released by the Department

of Commerce stating that metal imports impacted the US's ability to produce weapons, tanks, and aircrafts for national security (Schlesinger et al., 2018). The EU, Canada, Mexico, Australia, Argentina, Brazil, and South Korea were temporarily exempt from the steel and aluminum tariffs, with the primary target being China. However, in May 2018, the administration announced it would further implement tariffs on steel and aluminum imports from Canada, Mexico, and the EU, with the EU immediately calling for countermeasures (Pramuk, 2018). Shortly after, on June 5, 2018, Mexico announced 25% tariffs on US whiskey , steel, fresh cheese, and other agricultural products (Reuters, 2018). On June 22, 2018, the EU imposed a 25% tariff on US whiskey, boats, motorcycles, and peanut butter (among other products) with Canada following on July 1, 2018, levying a 10% tariff on US whiskey, beef, and agricultural products (Daniels, 2018). Finally, on July 6, 2018, China imposed a 25% tariffs on US whiskey; this tax went into effect after years of significant growth including a 1,200 percent increase in US liquor exported to China between 2011 and 2017, with most of that liquor being US whiskey. It is important to note that the US did not levy retaliatory tariffs on foreign liquor imports until October 2019. The 25% EU tariffs were suspended in 2021 as a result of an agreement between the US and the EU to put the tariffs on hold until 2024, but were threatened to be reinstated at a 50% rate beginning January 1, 2024 (Peterson & Mackrael, 2023). In December 2023, the US and EU came to an agreement to extend the suspension of 50% tariffs on US whiskey until March 31, 2025 (Gomez, 2023),

2.2 US Whiskey Background

US whiskey is a unique spirit that accounted for $1.1 billion of the $1.6 billion total US spirits sold overseas in 2017 (Reuters, 2019). More specifically, Kentucky Bourbon and Tennessee Whiskey are world renowned alcoholic spirits. These two unique products make up 86% of US whiskey sales in our sample. Per a US senate concurrent resolution passed in May of 1964,

"Bourbon whiskey" is a "distinctive product of the United States," (S. Con. Res. 19, 1964). Kentucky Bourbon must be produced, distilled, and aged in new, charred oak containers in the state of Kentucky for no less than one year. Bourbon can be produced outside of Kentucky, but in that case cannot be labeled as Kentucky Bourbon. Across the state line, bourbon makers prefer to call their spirit Tennessee Whiskey. Tennessee Whiskey must be produced following the "Lincoln County Process," requiring fresh whiskey be charcoal filtered or steeped before aging in barrels (TN Code Section 57-2-106, 2021).

US whiskey produced outside of Kentucky and Tennessee has also seen significant growth in recent years, resulting in a $5.1 billion dollar industry (Goodking, 2023). US whiskey, especially Kentucky Bourbon and Tennessee Whiskey, are uniquely US products produced by both corporations and small batch distillers that employ domestic workers, purchase equipment and grain products from US producers and farmers and support the economy in the Southeast and across the US.[3]

2.3 Prior Literature and Hypothesis Development

Tariffs represent an important topic of interest in research. In the accounting and finance literature, studies typically exploit significant import tariff reductions as a setting to examine exogenous changes in competition on CEO pay, innovation, and disclosure related outcomes (Carter, Choi, & Sedatole, 2021; Glaeser & Landsman, 2021; Huang, Jennings, & Yu, 2017). Tariffs have been more commonly studied in economics literature. Traditional tariff theory conjectures that the impact of tariffs on the domestic economy and prices depends upon the elasticity of foreign export supply and demand (Bickerdike, 1906; Horst, 1971; Johnson, 1953, 1965). In general, home country import tariffs are levied to drive down demand for foreign

[3] Brown-Forman announced their commitment to purchasing grain from local farmers in 2023 (Brown-Forman, 2023).

products and increase revenue for domestic producers (Amiti et al., 2019) Facing an increase in prices of foreign imports due to a tariff, home country consumers increase their demand for products produced domestically, while in turn foreign producers should be forced to drive down their prices, thus transferring the foreign producer surplus to the home country in the form of tariff revenue (Amiti et al., 2019) The total home country gain depends whether the foreign country imposes a retaliatory tariff, though achieving this gain is possible even with retaliation (Johnson, 1953; Syropoulos, 2002).

Numerous studies have examined the impact of import tariffs on goods prices, competition, production, employment, supply chain networks, and import/ export variation (Amiti et al., 2019, 2020; Cavallo et al., 2021; Fajgelbaum et al., 2020; Flaaen & Pierce, 2020; Frésard & Valta, 2016; Hombert & Matray, 2018; Huang et al., 2023; Kreinin, 1961; Pierce & Schott, 2012b). Recent literature examining the US-China trade war documents mixed evidence regarding the impact of *import* tariffs on US domestic prices, suggesting that producers either pass tariff incidence onto consumers, or decrease profit margins to remain competitive (Amiti et al., 2019, 2020; Burd, 2023; Cavallo et al., 2021; Fajgelbaum et al., 2020). Cavallo et al., 2021 provides further evidence that US exporters *decrease* undifferentiated goods ex-tariff export prices in response to retaliatory tariffs levied by China on US goods. Nti et al., 2019 and Sabala & Devadoss, 2019 find that undifferentiated products impacted by the China retaliatory tariffs (pork and soybeans, respectively) experience declines in export volumes and ex-tariff prices. Despite significant attention focused on US import tariffs and ex-tariff export prices, there is limited direct empirical evidence about how *foreign* tariffs impact *US* product markets. Our study intends to fill this gap in the literature.

On the one hand, conventional tariff theory would suggest that US products impacted by foreign tariffs should decrease in price due to (1) an increase in domestic supply and (2) downward price pressure by the foreign government imposing the tariff. Prior research has shown liquor to have a negative price elasticity (Wagenaar et al., 2009). Such would suggest that in an effort to increase domestic sales, US brands would *decrease* their price in order to increase demand. However, producers make strategic pricing decisions in the face of suboptimal market conditions and may increase prices to recover revenue lost by the swift decrease in exports (Piercy, Cravens, & Lane, 2010). We state our general hypothesis as follows:

H1: US whiskey producers impacted by foreign tariffs decrease their domestic product prices.

To test this hypothesis, we take advantage of the recent targeted political tariffs impacting the US whiskey industry. With this setting, we can observe a situation in which a US product market faces a quasi-exogenous and significant increase in an export tariff without a change in domestic competition, as happens with import tariffs.

3. *Research Design*

3.1 Data and Sample Selection

3.1.1 Nielsen Retail Scanner Data

To obtain US whiskey retail price data, we use the Nielsen Retail Scanner Data from Kilts Center for marketing at the Chicago Booth School of Business. Nielsen Retail Scanner Data covers a wide variety of products, but we limit our primary sample to U.S. whiskey sales. The data includes weekly product, price, volume, and store-level information for 105 retailers, 10,636 participating stores, and 4,126 unique universal product codes (UPCs). We acquire UPC-level data

for US and foreign whiskey brands from the raw dataset and identify production locations.[4] From conversations with professionals in the liquor industry and our own research, liquor prices are typically set at manufacturers' suggested retail price (MSRP).[5] In locations in which alcoholic beverage sales are controlled by the state, Alcoholic Beverage Control sets a markup formula. Neither Tennessee nor Kentucky has state run liquor stores, and do not implement maximum price ceilings on sales.

3.2 Empirical Strategy

To identify the effect of foreign tariffs on US domestic prices, our primary analysis uses a differences-in-differences research design in which US whiskey is the treatment group, and imported (i.e., non-US produced) whiskey is the control group. Our primary specification is as follows:

$$Price = \alpha + \beta_1\, US\ Whiskey \times Post\ Change + \beta_2 Post\ Change + Month\ Fixed\ Effects + UPC\ Fixed\ Effects + Store\ Fixed\ Effects$$

Price is the unit level purchase price of the product sold. *Post Change* is an indicator variable equal to one for time periods (i.e., weeks) after June 22, 2018, and zero otherwise. We use this variable with month fixed effects to control for time because the first tariffs went into effect mid-month, meaning that month indicators do not perfectly align with the post period. *US Whiskey* is an indicator variable equal to one if the product sold is US whiskey, and zero otherwise. We do not include *US Whiskey* as an indicator because UPC fixed effects are included; UPCs do not change, so these fixed effect indicators control for production location. UPC fixed effects also control for any product-specific idiosyncrasies including product size. All regressions use robust standard

[4] Brands' production locations were collected by a research assistant.

[5] Standard markup formulas are used in states in which alcoholic beverage sales are controlled by the state. These states include Alabama, Idaho, Iowa, Maine, Michigan, Mississippi, Montana, New Hampshire, North Carolina, Ohio, Oregon, Pennsylvania, Utah, Vermont, Virginia, West Virginia, and Wyoming.

errors that are clustered by UPC. Our main variable of interest is *US Whiskey x Post Change*, which captures the change in US whiskey prices relative to imported whiskey prices after the US whiskey tariffs were implemented, controlling for time, product, and store effects.

3.3 Summary Statistics

In Table 1 we present descriptive statistics for our sample. Panel A displays descriptive statistics for our treatment group, US whiskey sales; and Panel B presents descriptive statistics for our control group, imported whiskey sales. The data are reported at the store-week level. The average price of US whiskey products sold is $22.21 and the average price of imported whiskey is $23.93. The average number of units sold per store-week at the UPC product level is 3.47 for the US whiskey sample and 5.06 for the imported sample.

4. Results

4.1 Main Result

Table 2 presents the results of our primary differences-in-differences analysis in which imported whiskey serves as our control group and we compare the price of US whiskey to imported whiskey following the implementation of foreign tariffs on US whiskey exports. Our coefficient of interest is the interaction of *US Whiskey* and *PostChange*. We find that the coefficient of interest is negative and significant ($p<0.05$), which supports our hypothesis by providing evidence that US whiskey prices decreased for domestic consumers following an increase in foreign tariffs.

Though our *PostChange* standalone indicator variable is negative and significant, this should not be interpreted as a decrease in the selling price of whiskey imported to the US. This indicator variable is included because the foreign tariffs on US whiskey were implemented mid-month, which means *PostChange* only controls for the final week of June for the control group.

This means that the coefficient on *PostChange* can only be interpreted in conjunction with month fixed effect indicators and the regression intercept. This variable is not independently informative but is a necessary control.

Our dependent variable is product price per store-week, meaning that our coefficient of interest on the interaction term can be interpreted as the decrease in price of US whiskey in the post period relative to imported whiskey. This coefficient is equal to -0.106, which corresponds to a 10-cent average decrease in the price of US whiskey relative to imported whiskey.

4.1.1 Parallel Trends Analysis

A key identifying assumption in our differences-in-differences analysis is that, prior to the foreign tariffs on US whiskey, treated whiskey (US producers) exhibits parallel trends in price (the outcome variable) compared to imported whiskey. Though there may be differences in treated and control observations, the parallel trends assumption requires that these differences remain constant in the pre-treatment period, only changing upon implementation of tariffs on US whiskey by foreign countries (i.e., pre-period differences would remain constant in the post-period absent treatment). We follow prior literature and re-estimate equation (1), replacing *USWhiskey x PostChange* with a separate indicator variable for each calendar month in 2018 (i.e., *USWhiskey x Month1*, *USWhiskey X Month2*, etc.) (i.e., De Simone, Lester, & Markle, 2020). We graph the coefficients on these interaction terms with a 90% confidence interval in Figure 1. Figure 1 demonstrates that the parallel trends assumption holds in the pre-period, but consistent with our hypothesis, there is a significant decrease in the price charged by US whiskey producers for whiskey sold domestically in the post period.

4.2 Cross-Sectional Analysis

In our next analysis, we seek to further understand strategic domestic pricing in the face of weakened demand and financial performance due to foreign tariffs. We do so in several ways. First, we examine whether producers implement different pricing decisions in the primary US whiskey production states of Kentucky and Tennessee. Zare et al. (2020) uses Nielsen scanner data to provide evidence that demand for local craft soda produced in Kentucky is less price responsive compared to outside markets. Additionally, Jarrett D. Hart (2019) suggests that demand for locally produced craft beer is also comparatively less price-elastic. As such, because Kentucky Bourbon and Tennessee Whiskey are unique locally produced products, we assume Kentucky and Tennessee whiskey consumers have less elastic demand and higher switching costs in their whiskey preferences. To provide evidence on this, we identify US whiskey that is sold in Kentucky or Tennessee and create an indicator variable for these product sales (*KY-TNSale*). We then interact our indicator with *USWhiskey x PostChange* to create a triple interaction that measures the additional impact that the foreign tariffs had on US whiskey sold in Kentucky and Tennessee in addition to the impact on domestic sales in general.

Table 3 presents the results of this test. Column (1) reports the results for our full sample, and Column (2) limits the sample to only whiskey sold in Kentucky and Tennessee during our sample period. In Column (1), the coefficient on *USWhiskey x PostChange* is negative and significant ($p<0.05$), demonstrating that states other than Tennessee and Kentucky that are included in the sample experienced an on average decrease in the price of US whiskey sold domestically relative to imported whiskey sold domestically. However, the coefficient on *USWhiskey x PostChange x KY-TNSale* is positive and significant and larger in magnitude. The coefficient of interest on our triple interaction is estimated to be 0.174, indicating that US whiskey

sold in the post period in Kentucky and Tennessee increased in price by 17-cents relative to the US whiskey sold in the post period in all other states included in the sample.

In column (2), our interaction term of interest is *USWhiskey x PostChange* because our sample is limited to only US and imported whiskey sold in Kentucky and Tennessee during the sample period, which decreases our observations from 24.8 million to 841,133. The coefficient of interest on our interaction term is positive and significant (0.121, $p<0.05$). This result provides evidence that US whiskey sold in Kentucky and Tennessee increased in price by 12-cents compared to imported whiskey sold in Kentucky and Tennessee. Taken together, these results show that, though whiskey producers decreased their domestic prices overall, they chose to increase their prices in Kentucky and Tennessee, whose consumers may have less elastic demand and higher switching costs. This indicates that domestic producers make strategic pricing decisions when impacted by foreign tariffs, with varying outcomes for US consumers.

Next, we consider cross-sectional differences based on whiskey popularity across different states. We create an indicator variable called *High/LowPop*. In column 1 (2) this variable is coded as one for store-weeks in the ten states with the highest (lowest) per-capita whiskey sales in the US, and zero otherwise.[6] If consumers in high (low) whiskey popularity states have less (more) elastic demand, then we would expect US whiskey producers to implement price increases (decreases) in order to improve overall financial performance.

The results of this test are reported in Table 4. Column 1 reports that the basic interaction of *USWhiskey x PostChange* is negative and significant ($p<0.05$), this is consistent with our primary finding, that in general US whiskey prices decreased relative to imported whiskey prices

[6] Our high whiskey popularity states are Alaska, Arkansas, Colorado, District of Columbia, Kentucky, Louisiana, Missouri, Tennessee, Virgina, and Wyoming. Our low whiskey popularity states are Connecticut, Massachusetts, Minnesota, New Jersey, New York, North Dakota, Rhode Island, South Dakota, Utah, and Washington.

across the US following the foreign tariff. However, triple interaction of *USWhiskey* × *PostChange* ×*High/LowPop* is positive and significant, showing states with the highest level of whiskey popularity experienced no change in their whiskey prices. Column 2 follows the same model, but with *High/LowPop* indicating states with the lowest per-capita whiskey popularity. This column still reports a negative coefficient for *USWhiskey x PostChange*, but also a negative coefficient on *USWhiskey* × *PostChange* ×*High/LowPop*. This provides evidence that US whiskey producers decreased prices the most in areas of the US with the highest degree of demand elasticity.

4.3 Robustness Tests

We perform two robustness tests to ensure our results are driven by changes in our treatment group. We consider foreign whiskey to be a high-quality control group. However, to alleviate concerns that our results could be driven by changes in foreign product markets after implementation of the tariffs, we consider an alternate control group. Our alternate control group consists of rum, vodka, and tequila prices. The results of this test are reported in Table 5, Column 1: Alternate Control. Similar to our main result in both significance and magnitude, the coefficient reported on our interaction of interest, *USWhiskey x PostChange* is negative and significant ($p<0.05$) showing an estimated coefficient equal to -0.097.

According to the Distilled Spirits Council of the United States, between 2014 and 2019, sales of super-premium bourbon ($50 dollars or more) increased by 135%. Much of this increase was driven by small craft brands which are generally considered boutique and cost more than mainstream brands such as Jack Daniel's or Maker's Mark. As such, to ensure our results are not specific to high price US whiskey products or driven by the growth in the US whiskey industry over the past decade, we limit our sample to only those products with a sales price of $50 dollars or less. Table 5, Column 2: High Price Cut presents the results of this analysis. We again confirm

that our results are not sensitive to high price products, as our interaction coefficient of interest reported on *USWhiskey x PostChange* is negative and significant ($p<0.05$) with an estimated value of -0.081. Taken together, both tests provide evidence that our main result is robust to various control groups and sample specifications and is not driven by changes in our control group.

5. *Additional Analyses*

5.1 Sales Volume

Our first additional analysis builds on the primary finding that our domestic whiskey producers impacted by the foreign tariffs decrease prices for US consumers. Seminal economic theory would suggest that demand increases as price decreases (Gale, 1955; Härdle et al., 1991). As such, we confirm this theory by examining whether sales volume of US whiskey among US consumers increased upon implementation of price decreases by US whiskey producers. Our results are reported in Table 6, Column 1, in which our outcome variable is the natural log of the number of units sold for our treatment and control groups. Our coefficient of interest reported on the interaction term *USWhiskey x PostChange* is positive and significant ($p<0.01$), showing an estimated coefficient equal to 0.021. This result demonstrates that by decreasing prices, US whiskey producers may be able to extract more profits via increased sales volume in a strategic effort to moderate declining performance.

5.2 Advertising Spending

Our second additional analysis builds on traditional marketing studies documenting the effects of marketing on sales and profits (Hanssens, Parsons, & Schultz, 2001). In the face of decreased demand and declining financial performance, our treated producers may (1) increase advertising spending to increase domestic sales (Hanssens et al., 2001) or (2) decrease advertising

spending to avoid losses or meet benchmarks (Cohen et al., 2010). To answer this question, we use Kantar Advertising Insights data, which provides detailed advertising spending data for our sample on a national and local level. Our results are reported in Table 7.[7] Our outcome variable of interest is *AdSpending*, measured as the monthly local advertising spending for our sample producers. Table 7, Column (1) reports our primary interaction of interest using a Poisson pseudo-maximum likelihood (PPML) fixed effects estimator. We report a negative and significant coefficient on *USWhiskey x PostChange*, indicating that overall, our treated producers decrease local advertising spending compared to control producers in the post-period. This result documents that producers may decrease expenses that are less likely to impact operating performance (Roychowdhury, 2006).

Next, we build on our cross-sectional findings by investigating whether producers change advertising spending in those markets with less elastic demand. To answer this question, we identify advertising spending in Kentucky and Tennessee. We then interact this indicator with *USWhiskey x PostChange* to create a triple interaction that measures the additional impact that the foreign tariffs had on advertising spending in Kentucky and Tennessee (our least price-elastic states) in addition to the impact on all local advertising spending in general. Table 7, Column (2) presents the results of this test. The coefficient on our variables of interest must be added to be correctly interpreted. In this case, when the coefficient reported on *USWhiskey x PostChange* is added to the coefficient reported for *USWhiskey x PostChange x KY-TNSale*, we find no significant effect, indicating that US whiskey producers did not decrease their advertising spending in Kentucky and Tennessee as they did in all other states. This result suggests that producers make strategic performance and spending decisions in markets that may have less elastic demand.

[7] Our sample for this test is small due to data limitations, with 6,768 observations.

6. *Conclusion*

Though there is a vast literature studying the impact of import tariffs on domestic markets, thus far limited empirical evidence exists on the impact of foreign tariffs on domestic markets. In this study, we take advantage of a setting that allows us to examine the impact of foreign tariffs on domestic prices and sales volume *without* a parallel change in domestic competition. Specifically, we use the recent politically motivated tariffs on US whiskey because these represent a tariff that is exogenous in implementation, significant in amount, and substantially impacted US producers foreign export demand. We are able to examine this impact without a change in domestic competition due to the fact that retaliatory tariffs on foreign whiskey were not enacted during our sample period.

Our results suggest that overall, producers respond to significant and exogenous foreign export tariffs by decreasing prices in local markets, which in turn increases sales volume. However, this pricing decision appears to be strategic, as producers increase prices in states where whiskey is most popular, and in Kentucky and Tennessee, the two states in which the majority of US whiskey is locally produced and thus demand might be less elastic. Our results are robust to both choice of control group and dropping high price US whiskeys. Additionally, we provide evidence that US whiskey producers decreased advertising spending on average, but not in Kentucky or Tennessee where local production may drive less elastic demand.

Overall, our study contributes to a growing literature on trade policy and provides relevant and timely information for producers, practitioners, and policymakers regarding the impact of trade policies, especially those that are politically motivated, on US domestic outcomes. In this case, tariffs erected to protect some US industries (i.e., steel and aluminum) can backfire and hurt

domestic producers including homegrown small businesses. Concurrently, we provide new evidence that foreign tariff impacts may not be generalizable across all domestic markets, with strategic pricing decisions driving variation in outcomes. Though our setting is limited to US whiskey, we believe our results can be applied more generally to differentiated product markets that are impacted by significant increases in foreign tariffs.

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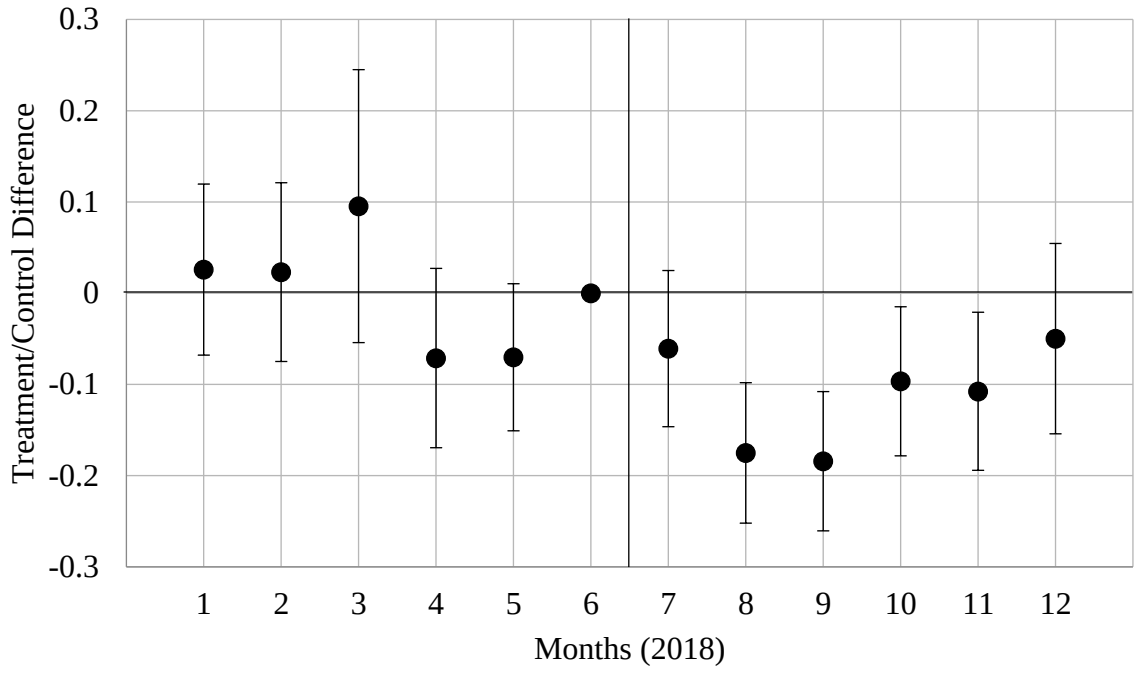
Figure 1
Event Study Differences-in-Differences Analysis



These figures report results from an event study DiD analysis surrounding implimentation of foregin tariffs on American Whiskey where *Price* is the dependent variable. We estimate regression (1) by including leads and lags of the treatment variable (e.g. *January×USA*, *February×USA*, etc.) rather than a single binary variable and plot the point estimates along with 95 percent confidence intervals.

Table 1

Descriptive Statistics

Panel A: U.S. Sample

Variables	N	Mean	SD	p25	Median	p75
Price	12,854,359	22.21	12.82	13.98	19.99	28.99
Units	12,854,359	3.465	6.756	1.000	2.000	4.000
Post Change	12,854,359	0.559	0.496	0.000	1.000	1.000

Panel B: Imported Sample

Variables	N	Mean	SD	p25	Median	p75
Price	11,927,804	23.93	15.42	13.99	20.96	29.99
Units	11,927,804	5.061	22.021	1.000	2.000	4.000
Post Change	11,927,804	0.553	0.497	0.000	1.000	1.000

This table reports descriptive statistics for key variables used in our main analyses which covers store-week observations during the period January 1, 2018 to December 31, 2018. Panel A reports the descriptive statistics for store-week observations of American Whiskey sales. Panel B reports the descriptive statistics for store-week observations of imported Whiskey sales. *Price* is the sales price of a given product during a given store-week. *Units* is the total number of units sold of a given product during a given store week. *Post Change* is an indicator variable equal to one for weeks that occurred after June 22, 2018, zero otherwise.

Table 2
Main Difference-in-Differences Results

VARIABLES	*Price* (1)
USWhiskey* × *PostChange	**-0.106****
	(-2.28)
PostChange	-0.047*
	(-1.74)
Month Fixed Effects	Yes
UPC Fixed Effects	Yes
Store Fixed Effects	Yes
Constant	23.149***
Observations	24,781,917
Adjusted R-squared	0.953

This table reports the DiD results from equation (1) comparing American Whiskey prices to imported whiskey prices around the implementation of foreign tariffs. *USWhiskey* represents an indicator variable equal to 1 for American Whiskey products, 0 for imported products. *PostChange* represents an indicator variable for store-week observations occurring on or after June 22, 2018. *Price* represents the sales price of a given product during a given store-week. The coefficient on *USA* is subsumed with track fixed effects. Coefficient estimates are reported with robust *t*-statistics in parentheses, where standard errors are clustered by product, and statistical significance is based on two-tailed tests. See Appendix A for remaining variable definitions.

*** p value <0.01, ** p value <0.05, * p value <0.1

Table 3

Cross-Sectional KY/TN Difference-in-Differences Results

VARIABLES	*Price* (1: Full Sample)	*Price* (2: KY-TN Sample)
USWhiskey* × *PostChange	**-0.112****	**0.121****
	(-2.34)	**(2.30)**
USWhiskey* × *PostChange* ×*KY-TNSale	**0.174*****	
	(2.64)	
PostChange	-0.046*	-0.096**
	(-1.66)	(-2.20)
PostChange ×*KY-TNSale*	-0.095**	
	(-2.16)	
USWhiskey ×*KY-TNSale*	-0.833***	
	(-3.69)	
Month Fixed Effects	Yes	Yes
UPC Fixed Effects	Yes	Yes
Store Fixed Effects	Yes	Yes
Constant	23.17***	22.032***
Observations	24,781,917	841,133
Adjusted R-squared	0.953	0.983

This table reports cross-sectional DiD that considers how the impact of foreign tariffs on pricing varied in production states relative to the rest of the U.S. Column 1 reports the results of a triple difference equation in which our interaction of interest, *USWhiskey* × *PostChange*, is further interacted with *KY-TNSale*, an indicator variable equal to 1 if the store-week took place in the states of Kentucky or Tennessee. Column 2 follows equation (1), comparing American Whiskey prices to imported whiskey prices around the implementation of foreign tariffs in a sample that is limited to store-weeks in the states of Kentucky and Tennessee. Coefficient estimates are reported with robust *t*-statistics in parentheses, where standard errors are clustered by product, and statistical significance is based on two-tailed tests.

*** *p* value <0.01, ** *p* value <0.05, * *p* value <0.1

Table 4

Cross-Sectional Popularity Difference-in-Differences Results

VARIABLES	*Price* (1: High Popularity)	*Price* (2: Low Popularity)
USWhiskey* × *PostChange	**-0.12****	**-0.093***
	(-2.4)	**(-1.93)**
USWhiskey* × *PostChange* ×*High/LowPop	**0.113***	**-0.137***
	(1.95)	**(-1.75)**
PostChange	-0.047*	-0.04
	(-1.66)	(-1.41)
PostChange × *High/LowPop*	0.004	0.047
	(0.11)	(-1.05)
USWhiskey × *High/LowPop*	-0.926***	0.056
	(-4.62)	(0.23)
Month Fixed Effects	Yes	Yes
UPC Fixed Effects	Yes	Yes
Store Fixed Effects	Yes	Yes
Constant	23.206***	23.146***
Observations	24,781,917	24,781,917
Adjusted R-squared	0.953	0.953

This table reports cross-sectional DiD that considers how the impact of foreign tariffs on pricing varied based on the relative popularity of whiskey across States. Column 1 reports the results of a triple difference equation in which our interaction of interest, *USWhiskey* × *PostChange*, is further interacted with *HighPop*, an indicator variable equal to 1 if the store-week took place in a state with high whiskey popularity and 0 otherwise. Column 2 reports the results of a triple difference equation in which our interaction of interest, *USWhiskey* × *PostChange*, is further interacted with *LowPop*, an indicator variable equal to 1 if the store-week took place in a state with low whiskey popularity and 0 otherwise. Coefficient estimates are reported with robust *t*-statistics in parentheses, where standard errors are clustered by product, and statistical significance is based on two-tailed tests.

*** *p* value <0.01, ** *p* value <0.05, * *p* value <0.1

Table 5

Main Difference-in-Differences Results Robustness

VARIABLES	*Price* (1: Alternate Control)	*Price* (2: High Price Cut)
USWhiskey* × *PostChange	**-0.097****	**-0.081****
	(-2.5)	**(-2.00)**
PostChange	-0.041***	-0.048*
	(-3.74)	(-1.89)
Month Fixed Effects	Yes	Yes
UPC Fixed Effects	Yes	Yes
Store Fixed Effects	Yes	Yes
Constant	17.859***	21.123***
Observations	53,333,327	23,572,386
Adjusted R-squared	0.948	0.94

This table reports robustness tests of the main results reported in this study. Column 1 uses the DiD model in equation (1) but compares American Whiskey prices to prices of Vodka, Rum, and Tequilla around the implementation of foreign whiskey tariffs. Column 2 uses the DiD model in equation (1) and follows the primary analysis, but with an alternative sample that drops all produces that are sold for $50 or more. Coefficient estimates are reported with robust *t*-statistics in parentheses, where standard errors are clustered by product, and statistical significance is based on two-tailed tests. See Appendix A for remaining variable definitions.

*** p value <0.01, ** p value <0.05, * p value <0.1

Table 6

Sales Volume Difference-in-Differences Results

VARIABLES	*LnUnitsSold* (1)
USWhiskey* × *PostChange	**0.021*** (3.63)**
PostChange	-0.011*** (-3.21)
Month Fixed Effects	Yes
UPC Fixed Effects	Yes
Store Fixed Effects	Yes
Constant	0.77***
Observations	24,781,917
Adjusted R-squared	0.387

This table reports DiD results using equation (1) to compare the sales volume of American Whiskey to that of imported whiskey around the implementation of foreign tariffs. *LnUnitsSold* represents is the natural log of the number of units sold of a given product in a given store-week. The coefficient on *USA* is subsumed with track fixed effects. Coefficient estimates are reported with robust *t*-statistics in parentheses, where standard errors are clustered by product, and statistical significance is based on two-tailed tests. See Appendix A for remaining variable definitions.

*** *p* value <0.01, ** *p* value <0.05, * *p* value <0.1

Table 7
Advertising Difference-in-Differences Results

VARIABLES	*AdSpending* (1)	*AdSpending* (2)
USWhiskey* × *PostChange	**-1.224****	**-1.297****
	(-1.99)	**(-2.02)**
USWhiskey* × *PostChange* × *KY-TNSale		**1.601****
		(2.09)
PostChange × *KY-TNSale*		-1.046*
		(-1.93)
Month Fixed Effects	Yes	Yes
Brand-State Fixed Effects	Yes	Yes
Constant	8.318***	8.315***
Observations	6,768	6,768
Adjusted R-squared	0.629	0.63

This table reports the DiD results using a Poisson pseudo-maximum likelihood (PPML) fixed effects estimator to compare local advertising spending by American Whiskey brands to local advertising spending by imported whiskey brands around the implementation of foreign tariffs. *USWhiskey* represents an indicator variable equal to 1 for American Whiskey products, 0 for imported products. *PostChange* represents an indicator variable for brand-month-state observations occurring on or after May 2018. *AdSpending* represents the amount of advertising spending that occurred for a given whiskey brand, during a given month, in each state. Column 1 reports basic difference-in-difference results. Column 2 presents a cross-sectional analysis in which the main interaction of interest, *USWhiskey* × *PostChange*, is further interacted with *KY-TNSale*, an indicator variable equal to 1 for brand-month-state observations occurring in Kentucky or Tennessee. Coefficient estimates are reported with robust *t*-statistics in parentheses, where standard errors are clustered by product, and statistical significance is based on two-tailed tests. See Appendix A for remaining variable definitions.

*** p value <0.01, ** p value <0.05, * p value <0.1

Appendix A

Variable Definitions

Variable	Description	Source
Dependent Variables		
Price	The price-per-unit of liquor sold in our sample. This data is reported at the store-week level.	Nielsen
LnUnitsSold	The natural log of the number of units sold. This data is reported at the store-week level.	Nielsen
AdSpending	Dollar value of advertising spending amounts reported at the local level.	Kantar Advertising Insights
Independent Variables		
USWhiskey	An indicator variable equal to one if the product sold is US whiskey, and zero otherwise.	Nielsen
PostChange	An indicator variable equal to one for time periods (i.e., weeks) after June 22, 2018, and zero otherwise.	Nielsen
KY-TNSale	An indicator variable equal to one if the unit of whiskey sold is sold in Kentucky or Tennessee, and zero otherwise.	Nielsen
High/LowPop	An indicator variable equal to one for store-weeks in the ten states with the highest (lowest) per-capita whiskey sales in the US, and zero otherwise. See footnote 3 on page 12 for details.	Nielsen