Buy American: Can Businesses Capitalize on the Calls for Patriotic Spending?

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Buy American:
Can Businesses Capitalize on the Calls for Patriotic Spending?

Thesis submitted in partial fulfillment of Honors

By

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Chapter 1
Literature Review

Introduction

The recent economic downturn has once again aroused patriotic disdain for foreign producers (Gringberg, 2011; Saad, 2009). Frequent arguments for purchasing domestic products include the belief that American-made products create quality jobs, the concept that buying American-made products will solve our economic woes, and the argument that purchasing American products creates reciprocity that ultimately helps the purchaser (MadeInUSA.com, 2009; MadeInUSAForever, 2007).

While patriotic sentiment can encourage the purchase of domestic goods (Shimp & Sharma, 1987; Vida & Reardon, 2008), the higher prices of domestic goods can often be a deterrent to “patriotic spending.” The analysis of these conflicting pressures is the essence of this research. Does a sense of patriotic duty translate into a willingness to pay more for domestic products?

Consumer Ethnocentrism

The CETSCALE, developed by Shimp and Sharma (1987), is the standard tool used to measure the ethnocentric tendencies of consumers. This scale consists of 17 Likert type questions which are used to compute a score that measures the strength of a consumer's tendency to purchase domestic products. The higher score an individual, group, or community receives, the more likely they are to prefer domestically produced products over similar imports. The
developers of the CETSCALE suggest companies use it to help estimate whether to offer domestic or foreign products to specific groups of consumers.

The CETSCALE has been used to measure ethnocentric tendencies in several studies. Kucukemiroglu (1997) analyzed how several character traits were correlated with ethnocentric tendencies. Family concern and community concern were two lifestyle factors that showed a positive correlation with ethnocentrism. Watson and Wright (1999) found that females were more ethnocentric than men, people who only graduated high school were more ethnocentric than college graduates, and higher income translated into less ethnocentric tendencies.

Yoo, Thelen, and Magini (2008) developed a variant of the CETSCALE to measure ethnocentric tendencies for foreign services. This study found that those who had lost a job to offshoring, felt the threat of losing their job, or had a family member whose job was lost to offshoring were more likely to view foreign services negatively.

While many studies make use of the CETSCALE, others use surveys in which participants are asked to choose between almost identical foreign and domestic products. Balbanis and Diamantopoulos (2004) conducted a study in which respondents ranked their preference for identical products from several importers and their home country. Domestic products were preferred over imported goods in 7 out of 8 product categories. A 2009 study used a simple yes or no question to determine whether consumers would only consider purchasing domestic cars (Saad). This study found that the percentage of consumers who would only consider purchasing domestically produced cars increased from 30% in December 2008 to 37% in February of 2009.
In addition to a pro-domestic stance, consumer choice is also affected by anti-foreign sentiment (Vida & Reardon, 2008). In support of these findings, many of the websites that promote “Buy-American” also promote avoiding Chinese products (MadeInUsa, 2009). Vida & Reardon (2008) also found that patriotism and ethnocentrism had more influence on consumption habits than perceived quality of the product. Verlegh (2007) found that perceived product quality is positively influenced by national identification and ethnocentrism. That is to say, consumers perceive domestic products to be of superior quality, and quality then forms the basis for product selection. We could call perceived quality an intervening variable in this case.

In summary, consumer preference for domestic goods, or consumer ethnocentrism, can be affected by gender, educational level, and many lifestyle factors. By knowing what factors contribute to a higher ethnocentric tendency, manufacturers and managers can cater their offerings to the consumer base most likely to be receptive to them.

The Effect of Price

Consumer ethnocentrism, as measured by the CETSCALE and surveys, forms the basis of an initial bias in favor of purchasing domestic products, but the lower price of foreign products can have an opposite effect. Producing abroad often enables companies to produce at lower cost (Farelle, 2004). The lower cost of foreign production gives imported products a price advantage when they are sold alongside domestically produced items. In this situation, the consumer has two opposing forces influencing their decision. On one hand, the more ethnocentric they are, the more they will prefer domestically produced products. On the other
hand, the lower price of imported goods can be a deterrent to the purchase of domestically produced goods.

While significant research has been done in relation to estimating ethnocentric tendencies with the CETSCALE and surveys, fewer studies have analyzed the effect of price on a consumer's decision to buy imports. Cai (2002) found that, when prices are equal, consumers have a tendency to prefer products from more developed countries as opposed to less developed countries. However, Cai also found that by decreasing the price of the good from the less developed nation, consumers began to prefer the product from the less developed nation over the product that they originally favored. Although Cai studied the effect of price on the decision to buy from a less developed or more developed nation, this research shows that price can influence consumers to buy a product from the country that they initially held in less esteem.

Building upon Cai's findings and the CETSCALE research, it is likely that consumers will prefer domestically produced products over imports when the prices are equal. As domestic products become relatively more expensive, it is uncertain whether consumers will purchase the domestic products or the lower cost imports.

Evidence of Current Niche Markets

Some companies have policies in place that seem to suggest that consumers are willing to pay more for domestic products. Although there are differences between products and services (Yoo, Thelen, & Magini, 2008), some service providers have found that it is more profitable to re-shore their call centers to offer domestic services (Scott, 2007). These companies believe that
by paying higher wages to domestic employees, their customer satisfaction and loyalty will increase and that profit will actually be greater despite the increased cost of domestic employees.

In fulfilling the needs of the developing Asian world, the Asian Development Bank intermediates the bidding process between buyers and producers of capital goods. As part of their Domestic Preference Scheme, domestic products receive favorable bidding conditions (Asian Development Bank, 2007). If a domestic bid is the lowest, it automatically wins the contract, but if a bid from a foreign nation is lowest, it then faces a 15% penalty against the bid from the home country. In essence, the Domestic Preference Scheme gives a 15% premium to domestically produced capital goods.

**Socially Responsible Products**

While the CETSCALE is a useful tool, it is not intended to study the effect of price on purchasing behavior; similarly, many surveys generally assume equal prices for foreign and domestic products. Thus, it is necessary to find circumstances in which consumers have the option of choosing between two similar, but differently priced products. One could say that the majority of reasons given for buying American products rest on a moral argument. One argument for buying American is that the consumer is contributing to keeping their fellow countrymen employed (MadeInUSA.org, 2010). Interestingly, websites that promote America-made Products argue that consumers should do so because the American companies provide better working conditions, equitable wages, and more environmentally friendly methods of production (MadeInUSA.org, 2010).

While there is not a perfect equality between “Buy American” and Fair-Trade, there are enough similarities that many studies concerning Fair-Trade price premiums can be used as a background in preparing this research and designing the data collection methods. Arnot, Boxall, & Cash (2006) conducted a revealed preference study in which a campus coffee vendor lowered the prices of the Fair-Trade coffee being sold. The researchers found that demand for Fair-Trade coffee is relatively inelastic. If this is true, then raising the price of the Fair-Trade coffee would increase revenue.

By contrast, Delsmacker, Driesen, & Rayp (2005) conducted a survey among 808 Belgian consumers. The researchers found that the mean premium that the consumers would pay for Fair-Trade coffee was 10% and that only 10% of the participants were willing to pay the current premium of 27 percent. These researchers argued that demand for Fair-Trade coffee was elastic. Under this scenario, price should be reduced to increase revenue. Loureiro & Lotdale (2005) found that the premium for Fair-Trade coffee was 21.64 cents over the base price of $6.50 per pound. This translates into a 3.3% premium.

Howard and Allen (2008) used a mail survey to analyze consumer preference for Fair-Trade strawberries. They found that the median premium that consumers were willing to pay was
67%. In a revealed preference study, Anderson and Hansen (2004) found that when Eco-Friendly plywood and regular plywood were sold side by side at equal prices, more Eco-Friendly plywood was purchased than regular plywood. However, a mere 2% increase in the price of the Eco-Friendly plywood caused more of the regular plywood to be purchased. Despite this unwillingness to pay more for Eco-Friendly plywood, there is the possibility that consumers would be willing to pay a premium for American-made products. Jung and Pamela (2011) found that consumers paid higher premiums for American cotton than either organic or sustainably grown cotton. Thus, it is possible that consumers would pay a premium for domestic products.

Basu and Hicks (2008) found that consumer willingness to pay for Fair-Trade coffee is linked to the perceived benefit that the farmers will receive from the purchase. Interestingly, Irwin (2009) argued against the “Buy American” provisions of the 2008 stimulus bill on the grounds that steel making is a capital intensive process and that the provisions in the bill would have little benefit for the workers. While this study only compares price premiums for domestic products, companies should consider the possibility that the domestic products with the highest premiums are those that offer the most benefit to the domestic producers.

There are some general conclusions that can be drawn about socially responsible products. First, there is still uncertainty as to whether demand for socially responsible products is elastic or inelastic. Second, revealed preference studies and surveys show differing results as to the premiums that consumers would be willing to pay for such products. While the inclusion of Fair-Trade type products gives a general idea about the types of premiums that consumers are
willing to pay for products that provide a perceived social benefit, this research should not be used to estimate premiums that consumers would be willing to pay for American-made products.

**Summary of Current Research**

Research using both surveys and the CETSCALE has shown that consumers have an initial bias in favor of products from their home country. Further research has shown that these tendencies can be influenced by several lifestyle factors. However, when consumers are asked to choose between almost identical products from two countries, studies have shown that lower price can influence the consumer to purchase the product from the less desirable country. Depending on whether a survey or revealed preference research is conducted, the demand for “socially responsible” products has been reported as both elastic and inelastic.

**Further Research**

Consumer ethnocentrism, as measured by the CETSCALE and surveys, is only one component of the consumer's decision to purchase foreign or domestic products. The other major factor in this decision is the price of the products. Thus, there is a conflict between consumer ethnocentrism and the desire for lower prices. The resolution of this conflict is the consumer's purchasing decision. Instead of studying one side of the decision making process, such as ethnocentrism, in isolation, this study seeks to investigate the final outcome, the purchasing decision. By studying current purchasing decisions, as reflected by the prices of a wide range of goods, this study seeks to answer the question that many firms should consider: “Will consumers pay more for domestic products?” By sampling a wide range of actual market prices, this study
seeks to avoid the discrepancy in the literature between survey results and actual purchasing behavior.
Chapter 2
Methods

Research Objective

The goal of this research is to determine if American-made products tend to command price premiums over similar foreign imports. This is important because a willingness to pay more for American-made products could translate into a business opportunity for firms.

Methods

Surveys are one method for gauging consumer tendency to purchase higher priced domestic products, but this method does have drawbacks. Due to the fact that purchasing American-made products is often presented as a moral or patriotic duty, there exists the possibility that respondents will overstate their willingness to buy American-made products. As with any survey, there is the possibility that the participants will not interpret the question the way it was intended to be written.

The main drawback of any survey is that it can only analyze a stated preference. By studying revealed preference for domestic products, as reflected by the actual purchasing habits of consumers, it is expected that some of the drawbacks of the survey method can be minimized. As noted in Chapter 1, surveys have yielded inconclusive results with regard to the demand for “Socially Responsible” products Arnot, Boxall, & Cash (2006) & Delsmacker, Driesen, & Rayp (2005). By studying actual prices, this research seeks to avoid the common shortcomings of surveys in general, but it also seeks to provide more clarity where current surveys appear to suggest differing conclusions.
In order to determine whether there is a price premium for domestic products, the study will compare the current market prices of similar domestic and foreign products. For example, American-made pencils will be compared to imported pencils, and domestically produced tools will be compared to imported ones. Each foreign product will be matched with a domestic product to evaluate price differences. Products will be chosen from several different locations around the country to ensure a random sample. In addition, online products will be included as a measure of country-wide prices. After collecting all data, there will be several product categories. Each location from which prices are gathered will have a group of both imported and domestic products.

Preferred Test

The precise type of test conducted will depend on the distribution of the sample data. If the data is normally distributed, a matched pairs t-test will be used. The use of a matched pairs t-test would allow the researcher to compare all of the imported product prices to all of the domestic product prices. A matched pairs test was selected instead of a general t-test due to the fact that pairing the products allows a more powerful test. In other words, pairing the samples increases the probability of rejecting a false null hypothesis. A paired test also allows the researcher to control for other differences between the products. Comparing prices of matched items is useful, but the intent is to find if domestic products carry a percent price premium. The focus on premiums, instead of prices, ensures that high and low cost items are given equal weight. If only prices were compared, actual dollar differences between more expensive items,
like sleeping bags and shovels, could easily outweigh any price differences in less expensive items like pencils and glue.

Since the matched pairs test may not be conducted, it is essential to remember that the sample data will still be collected in the form of matched pairs. The data set will be composed of a pair of two very similar items that differ only in their country of origin. From this starting point of matched pair prices, the data can be converted into a single set of premiums. Since the goal is to find if domestic products carry a premium, imported products will be treated as the base product. The formula

\[
\frac{\text{Domestic} - \text{Import}}{\text{Import}} \times 100
\]

will be used to convert to a single set of data. Instead of a list of two prices for each product, the foreign and domestic price, there will be a single list reflecting the percent premium that the domestic product carries. It should be noted that the premium may be negative if the domestic product is less costly.

**Hypothesis Test**

After the data have been converted into a percent premium, it becomes possible to do a simple test of mean to determine whether there exists a premium for the domestic products. Operating under the assumption that domestic production is usually more expensive than foreign production (Farelle, 2004) and the rule that a firm should maximize profit, there is no incentive for the firm to produce domestically if the premium is zero or less. With this in mind, the test of mean should be constructed as a one tailed test. From the view of the firm, both a negative
premium and a premium of zero are the same with respect to domestic production. In neither case will domestic production offer an improvement over the current situation. A negative premium would clearly be unacceptable, and a premium of zero would likely be offset by the higher cost of production. Due to this consideration, the null hypothesis will be that the domestic product premium is less than or equal to zero.

\[
\text{Ho: The Mean Domestic Premium is less than or equal to zero.}
\]

\[
\text{H1: The Mean Domestic Premium is greater than zero.}
\]

Ho: MDP ≤ 0

H1: MDP > 0

**Substitute Test**

In the ideal situation, the sample data would approximate the normal distribution, and the sample premiums could be analyzed with a t-test of mean. If the data does not approximate the normal distribution, a non-parametric test will be used to analyze the data. In this case, a t-test would be inappropriate and could give misleading information.

Given the nature of this research, however, it is absolutely necessary to compare domestic and foreign *premiums* as opposed to *prices*. As stated previously, reliance on premiums is imperative for giving equal weight to high and low priced items. The alternative test will be the
Wilcoxon Ranked Sum Test. This test is a non-parametric alternative to a matched pairs t-test, and uses the signed ranks of the differences of the pairs to calculate a test statistic.

By treating the imported products as the baseline and assigning each imported product a premium value of zero, the researcher can calculate a premium for domestic products. Instead of testing for median prices, this application of the Wilcoxon Ranked Sum test will test for the median premium.

**Substitute Hypothesis Test**

Since the Wilcoxon Ranked Sum test is different than a simple t-test of mean, the null and alternative hypothesis must be slightly different. If this test is used, the null hypothesis will be that there is no significant difference in the median premiums of the two populations. The alternative hypothesis will be that there is a significant difference between the medians of the two populations. It should be noted that the median is being compared with this test as opposed to the mean. Since this is a two sample test, the rejection of equal means will necessarily mean that one of the groups comes from a distribution with a higher median. While the Wilcoxon Ranked Sum test of median is not as definitive as the t-test of mean, it is still valuable. If the analysis shows that domestic products come from a population with a higher median premium, this would still be a stimulus for businesses to investigate the possibility of a niche market for domestic products.
Ho: The Median Domestic Premium is less than or equal to zero

H1: The Median Domestic Premium is greater than zero

\[
\text{MedP} \leq 0 \\
\text{MedP} > 0
\]

**Test Market Conditions**

The most important part of this study is ensuring that the difference in cost between each matched pair is indeed due to the variable of country of origin. Thus, it is desirable to compare products that are as similar as possible. However, this does not necessarily mean that the research will compare the perfectly homogeneous products of a perfectly competitive market. While this would seem to be a valid option, the definition of a perfectly competitive market is that any product is indistinguishable from any of the others. Due to the perfectly inelastic demand for perfectly competitive markets, American-made products, if they carried a premium, would not sell at all.

Thus, the question of American-made premiums really depends on the market in which the products are sold. American-made products in a perfectly competitive market would have to be sold at the market price or not at all; consequently, there is no expectation of a premium for domestically produced goods. The initial question of the thesis was “Do American-made products command a price premium? This can be restated as “Do consumers value American-made products differently than similar imported goods?” In other words, does a Made in America label indicate product differentiation; if so, are consumers willing to pay more for this differentiated product? In order to answer this question, it is necessary to compare American-
made products in monopolistic competition. In this type of market, the products are very similar, but are differentiated based on marketing and minute differences.

With the division of labor among countries, many products are made of components from various countries, and it can be confusing to define what constitutes an American-made product. An operational definition of “American-made products” is needed for my study. For the purposes of this study, the following categories of products will be classified as American-made:

A). Products that state “Made in America”

B). Products that are “Made in America from foreign components”

C). Products that are “Assembled in America” will be included if

1. They are advertised as an American product

While it may seem questionable to include products assembled in the United States, such products will only be counted as American-made if they attempt to differentiate themselves by this fact. For instance, a sticker with an American flag is clearly attempting to alert consumers to the fact that this product has some ties to America, but a product that is assembled in the USA without such a sticker is not attempting to differentiate itself.

Assumptions of Equilibrium

The revealed preference method of analysis relies on the assumption that the products chosen for comparison are being sold in a market that is near equilibrium. Since this study can only account for the prices of the items in question, the assumption of a tendency toward equilibrium is critical. If the market for the products is not near equilibrium, the prices for the
imported or domestic products would not be reflective of the true prices that consumers would be willing to pay. If this were the case, domestic products might be offered for sale at a price that is higher than foreign products, but the products might not be purchased at this price. As a result, the conclusions of the study could give misleading information about the premiums that are actually paid for domestic products.

Consequently, it is important that the assumption of a market in equilibrium be justified. Given that the goal of the firm is to maximize profit, it is reasonable to expect that stores are likely to stock products that they feel will sell; in other words, they believe customers will be willing to pay the price that the store asks. Determining whether each product in the study is being sold in a market near equilibrium is beyond the scope of the study and would be difficult to predict without access to sales reports and inventory statements. The fact that a product is being offered for sale at a major store necessarily means that firms believe this is the price that consumers will be willing to pay and that they will be able to sell a significant portion of their inventory. Due to the fact that the stores selling the products have access to sales reports, pricing analysts, and other data un-available to the author, it is necessary to assume that the firms are selling the products at a price that is approaching equilibrium.

One objection to this method is that it does not provide any data for the quantity sold. Given that total revenue is equal to price times quantity, this research would seem to attempt to answer a multi-variable question. If there is indeed a premium for domestic products, how can the firm ensure that they will make a profit by re-shoring? What if they re-shore and find that, while there is a price premium, they can only sell a fraction of their previous quantity? The
research question behind this thesis is not “Should a firm re-shore?” The question is “Do
domestic products command a premium?” Due to the nature of this research, it is only possible
to answer if there is, on average, a premium for American-made products.

By answering the general question of domestic product premiums, individual firms can
then compare costs of domestic production to expected premium and construct demand curves
for their specific product. If the market for American products is a niche market, a leading
manufacturer of imported goods would lose money by completely moving production to the
United States. However, if there is a demand for significantly higher price domestic products,
that same firm could make additional profit by moving a small amount of production to the
United States and capitalizing on the premiums associated with American-made products but still
producing the bulk of their product abroad.

Collection

The products selected for comparison will be gathered from several major retailers.
Products with a high degree of differentiation, such as cars will be disregarded from the study.
Products such as computers, in which a combination of multiple variables (CPU, memory,
battery life, and software packages) determines the value of the product will also be disregarded.
The results of the pre-screening process will limit the sample pool to a more manageable, as well
as more applicable, size.

The actual collection process is fairly simple. The researcher will examine a wide range
of products both online and in stores. The first criterion is to find two varieties of the same
product in a store. If there is only one offering of a product, such as one brand of computer paper, no further comparison is possible. If a store does offer multiple versions of the same product, further analysis can be conducted. If the various offerings of the same product are all from the same country, whether this is a foreign or domestic producer, no additional comparison is possible. If, however, the products are from a domestic and foreign producer, close attention will be paid to ensure that the products fulfill the same function and have similar characteristics. If all of the above criteria are met, both products will be recorded in a notebook. The entries will include the price of the product, the country of origin, and the quantity of the product. Quantity is especially important due to the desire to compare products on a per unit cost.

Online data collection presents an additional challenge in that it is not possible to simply look at a product and find a “made in” label. As a result, there is no quick way to tell where a product is made. The exception to this rule is stores that specifically stock American-made products. These stores specialize in offering only American-made products and make sure to label their products accordingly. However, the majority of online retailers do not openly state the country of origin. Since both an imported and domestic product must be available for comparison, the researcher must find out where the products are made. Instead of randomly searching for possible combinations that might have a domestic and foreign equivalent, the researcher will only search for imports that match an American-made product. Since it is possible to find products that are made in America, the researcher will make a list of about 50 American-made products online and then search for matching foreign products.
There are two options for determining the country of origin of an online product. Once an online product of unknown origin is found that matches the specifications of the online American-made product, the researcher could contact the manufacturer of the product and ask for this information. However, this option has some drawbacks. The researcher may have to wait while an email goes through a lengthy corporate information request process, or the attempt at contact could be disregarded by an already busy corporation.

An alternative method would be to find products in stores that match the online products that are made in America. Once a product is found, notes will be taken to identify this product in the online marketplace. For example, if a foreign shovel is found, the manufacturer, description, and model would be recorded. The researcher would then look for that same product online. By using this method, the researcher can assure the country of origin of the online products without depending on contact with multiple manufacturers.

With the exception of online products, the two products that form a matched pair will always be drawn from the same store. Given the fact that different stores have different pricing policies, product pairs will only be compared within the same store. Pricing policy is critical due to the dilemma between selling more at a low price and selling fewer at a high price. If products were compared from among different stores, there is the possibility that the difference in price could result from a different sales strategy as opposed to country of origin.
**Sub-Hypothesis**

While the general price premium between foreign and domestic products is the main focus of the research, additional information can be gained from the data collected. Using survey based methods, Watson and Wright found that lower income was associated with stronger consumer ethnocentrism (1999). Some of the areas from which the product data will be gathered have different income levels. While using either surveys or the revealed preference method by itself may give insight into the relationship between income and purchasing habits, a combination of the two methods will allow for increased accuracy.

Initially, several standard products, such as imported and domestic pencils and glue, will be compared in Southeast Florida. Similar products will also be compared in the East Tennessee area. This will provide four product groups: imports in East Tennessee and Southeast Florida and domestically produced products in East Tennessee and Southeast Florida. In order to conduct a matched pairs test across both regions, the four categories of data must be reduced to two categories. A diagram of the initial data is provided below.

<table>
<thead>
<tr>
<th></th>
<th>Florida Products</th>
<th>Tennessee Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import Price 1</td>
<td>Domestic Price 1</td>
<td>Import Price 1</td>
</tr>
<tr>
<td>Import Price 2</td>
<td>Domestic Price 2</td>
<td>Import Price 2</td>
</tr>
<tr>
<td>Import Price 3</td>
<td>Domestic Price 3</td>
<td>Import Price 3</td>
</tr>
<tr>
<td>Import Price 4</td>
<td>Domestic Price 4</td>
<td>Import Price 4</td>
</tr>
<tr>
<td>Import Price 5</td>
<td>Domestic Price 5</td>
<td>Import Price 5</td>
</tr>
</tbody>
</table>

Using this format, it is possible to perform a matched pairs test within the East Tennessee or Southeast Florida groups, but it is not possible to use a matched pairs test across locations. For
a matched pairs test, there must only be one data set from each location. Within each location, the进口 price will be subtracted from the domestic price and the difference will be divided by the imported price. The result will then be multiplied by 100 to create a percent premium for domestic products in each location.

<table>
<thead>
<tr>
<th>Florida Premium</th>
<th>Tennessee Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent Premium for Domestic Product 1</td>
<td>Percent Premium for Domestic Product 1</td>
</tr>
<tr>
<td>Percent Premium for Domestic Product 2</td>
<td>Percent Premium for Domestic Product 2</td>
</tr>
<tr>
<td>Percent Premium for Domestic Product 3</td>
<td>Percent Premium for Domestic Product 3</td>
</tr>
<tr>
<td>Percent Premium for Domestic Product 4</td>
<td>Percent Premium for Domestic Product 4</td>
</tr>
<tr>
<td>Percent Premium for Domestic Product 5</td>
<td>Percent Premium for Domestic Product 5</td>
</tr>
</tbody>
</table>

As a result, there will only be two data sets: a percent premium for domestic products in East Tennessee, and a percent premium for domestic products in Southeast Florida. Once the actual prices have been reduced to premiums, it is possible to perform a matched pairs test. While it is necessary to use premiums in order to perform a matched pairs test, there is an added benefit. By using percent premiums instead of comparing prices, locational cost of living differences can be held to a minimum. Prices of school supplies may be higher in East Tennessee than in Southeast Florida. For example, prices for the same products can be different across the country. American-made glue may command a $5 premium in East Tennessee and a $13 premium in Southeast Florida, but glue in general might be higher priced in Florida. The use of percent premiums holds constant the effects of differing costs of living and allows the research to examine the percent premium that domestic products command as opposed to a specific dollar amount.
The difficulty of finding strictly similar products in one location is hard, but finding the same pair of products in another location is likely to be even harder. With this in mind, the researcher is aware of the possibility that the sample size for the sub hypothesis will be small. When dealing with small samples, it may be necessary to use a Wilcoxon Ranked Sum test. This test will be similar to the test described in the Alternative Hypothesis Test section.

**Limitations**

In order to have the most valid results, only the most similar imported and domestic products will be studied. This will restrict product selection to fairly homogenous goods. While this product restriction will help increase the validity of the results, it may limit the applicability of the research. If there is a certain premium for domestic products of a certain price range, it would be an error to assume that high priced goods would enjoy a similar premium or any premium at all. Thus, the results of this study will be most beneficial to producers of highly similar products.
Chapter 3
Results

General Discussion

When weighing the possible methods of data collection for this research, the disadvantages of surveys were listed: mis-interpreted questions, the potential for bias, and the ability to measure only stated preference. While the revealed preference method of data collection avoided some of the drawbacks of the survey based method, it had its own unique set of drawbacks.

As anticipated in the methods section, the selection of each product pair was the most challenging aspect of the revealed preference method. It was much harder to find a matched pair of domestic and imported products than was initially expected. There are several explanations for this. As a result of comparative advantage, it is natural for certain countries to specialize in the production of certain products. As a result, many different firms will produce their own brand of a product in the same country. The result is that the while there are many varieties of dish soap, for example, all the products found were produced in the same country. This limited the product pool because it is not possible to compare imports to domestic products if all the products available come from the same country.

In the methods section, it was stated that great care would be taken to ensure that any price difference was due solely to the difference between the domestic or imported status of the product. Due to the fact that perfectly homogenous products are not a characteristic of
monopolistic competition, consumers could possibly find minute differences in all of the products sampled; one consumer may prefer the scent of the imported floor cleaner over the scent of the domestic version. Despite this, the strict scrutiny applied to product selection ensured that any differences were a matter of degree, such as the particular scent of a floor cleaner, as opposed to an outright difference of scented or un-scented.

**Pre-Analysis**

The primary objective of the research is to determine if the domestic products command, on average, a price premium over similar foreign imports. A total of 37 matched pairs were collected from all locations, physical and online. The prices and items can be found in Appendix A. Before any tests were conducted, a pre-analysis was necessary to determine what statistical techniques were most appropriate. As detailed in the methods section, the initial set of 37 matched pairs was reduced to one set of 37 premiums. After computing basic descriptive statistics for the initial set of 37 premiums, the mean premium was 80.18% and the standard deviation of the premiums was 149.56 percent.

After reviewing the data, it was found that one product pair, the measuring spoons, carried a premium more than three standard deviations from the mean. This information led the researcher to believe that some un-observed difference was causing the high premium for the domestic spoons. In order to maintain the validity of the data and ensure that only the most similar products were compared, this product pair was removed from the original data set. The
adjusted data set of 36 premiums had a mean premium of 60.18% and a standard deviation of 88.28 percent. The adjusted premium set is Appendix B.

The second step of pre-analysis was a normality assessment. The construction of a histogram showed that the data distribution was not normal. The researcher also constructed a probability plot in which the observed data were plotted against the expected values of the normal distribution (Appendix C). The researcher had intended to conduct a t-test of mean with the null hypothesis that the population premium for domestic products was less than or equal to zero. Because of the non normal sample distribution, the use of the t-test of mean was viewed more cautiously, and the Wilcoxon Ranked Sum test was used as the primary hypothesis test.

However, a non normal distribution does not immediately rule out the possibility of using a t-test of mean. According to the central limit theorem, even when the original population is not normally distributed, sample means greater than 30 observations can be approximated by the normal distribution (Triola, 2004). Because the concept of an average premium is more readily understood than a median premium, the t-test of mean has also been conducted for informational purposes only. The null and alternative hypotheses are as follows.

Ho: The mean domestic premium is less than or equal to zero.

\[ MDP \leq 0 \]

H1: The mean domestic premium is greater than zero.

\[ MDP > 0 \]
The results of the test yield a t statistic of 4.09. The null hypothesis is rejected at a significance level of .005, and the full results can be found in Appendix G. The interpretation of this test is that domestic products, on average, do have a premium over similar foreign imports.

**Wilcoxon Ranked Sum Test**

The Wilcoxon Ranked Sum test was determined to be the most appropriate test given a non-normal distribution of the sample data. The Ranked Sum test is a non-parametric alternative to a matched pairs t-test and uses the signed ranks of the differences of the pairs to calculate a test statistic. The Wilcoxon test has two key assumptions. The first criterion is that the products are randomly selected. The second assumption is that the population differences must be approximately symmetric.

As detailed in the methods section, the imported products were given a premium value of zero, and the domestic product premium was calculated from the price differences. This data set can be found in Appendix B. The hypotheses for the test are as follows.

\( H_0: \) The Median Difference in price premium between the pairs is less than or equal to zero.

\( H_0: \text{MedD} \leq 0 \)

\( H_1: \) The Median Difference in price premium between the pairs is greater than zero.

\( H_1: \text{MedD} > 0 \)
The Wilcoxon test is different than many other tests in that the null hypothesis is rejected if the test statistic is \textit{less} than the critical value. As shown by the table, the Wilcoxon test placed the test statistic well within the region of rejection, and the null hypothesis was easily rejected. Full results of the test can be found in Appendix D. Given that the samples do not come from distributions with the same median and the fact that the domestic product grouping had the higher sample median, it can be concluded that domestic products come from a population with a higher median premium than imported products.

The reader should notice that the critical value is listed as $> 109$. After consulting numerous distribution tables, the highest critical value for the Wilcoxon Ranked Sum test was 109; however, this was for a smaller sample size than the sample for this research. As a result, the critical value is actually larger than 109. This makes the rejection of the null hypothesis even more certain.

\[
\begin{array}{|c|c|}
\hline
\text{Sample Size} & 36 \\
\text{Significance Level} & .005 \\
\text{Critical Value} & > 109 \\
\text{Test Statistic} & 90.5 \\
\hline
\end{array}
\]

\textbf{Wilcoxon Summary}

\textbf{Large Sample Wilcoxon}

While it certain that the critical value is greater than 109, the inability to produce an exact critical value limits the usefulness of the interpretation. In addition to the standard
Wilcoxon Ranked Sum test, there is a variation of the Wilcoxon test that is intended for use on large sample sizes that still have a non-normal distribution. As the sample size of the test increases, the test statistic can be calculated according to the Z distribution. This allows the calculation of an exact critical value, and more importantly, allows the calculation of a p value. Finally, the inner workings of the Wilcoxon test such as comparing the signed ranks are preserved. In short, this variant of the test allows more of the precision of a parametric test while it maintains the ability to be used on non-normal data distributions.

After performing the calculations (Appendix F) necessary to transform the results of the Wilcoxon test into a format that is compatible with the standard normal distribution, the Z statistic was approximately -3.69. The calculation of a p value for the standard Wilcoxon test is an estimate based on the sample data. As a result, the transformation of the Wilcoxon results to the standard normal distribution has another important benefit, the ability to generate an accurate p value. With such a low Z score, the p value for this test statistic is closely approximated by zero. Since the p value is lower than an alpha of .05, the null hypothesis can be easily rejected.

Is the Wilcoxon Test Applicable?

It is at this point that a core assumption of the Wilcoxon test must be discussed. This assumption is that the population of differences is approximately symmetric. As discussed in the previous paragraph, this test makes a judgment about one premium, the median premium. As long as the foreign and domestic price distributions follow the symmetric distribution, the test will yield valid results; however, misleading information could be given if the population of
differences is not approximately symmetric. It is for this reason that the population of differences has also been assessed for symmetry.

As shown in Appendix E, the distribution of the sample differences in premium is not symmetric. Instead of mirror halves of a distribution, the sample distribution more closely approximates one half of the normal distribution. If the Wilcoxon Ranked Sum test was performed in a situation in which the population of differences was not symmetrically distributed, it would still give a true indication about the median premiums, but the magnitude of the differences on either side of the median might not be symmetric. For example, many imported products might cost slightly more than their domestic counterparts. This would result in the test indicating that imports have a higher median price, but the domestic products that are more expensive could be significantly more expensive. As a result, there would be conflicting results based on whether the median or mean was considered.

In this particular case, however, the skewed nature of the sample distribution affirms the findings of the Ranked Sum Test. As discussed, the assumption of symmetry prevents a conflict between the median and mean. While the sample distribution is not symmetric, the data is skewed in favor of the conclusions drawn from the Wilcoxon test. Not only does the test show that the median premium for domestic products is higher than imports, the histogram also shows that the mean premium for domestic products is greater than zero. The end result of this asymmetrical distribution of premiums is that the researcher can be more certain of the conclusions.
Secondary Discussion

The secondary purpose of the research was to add evidence to the current body of knowledge regarding how the willingness to purchase domestic products is related to income level. To summarize, the researcher intended to collect two identical sets of matched pairs from different income areas of the country, reduce the four sets of data to two sets of premiums, and compare the premiums in one location to the premiums in the other location.

As noted in the general discussion, it was difficult to find matched pairs within a location. It was even harder to find the same matched pair in a different area of the country. After much searching, similar domestic and imported framing hammers were found in Florida. However, the researcher was unable to find a similar matched pair of domestic and imported hammers in Tennessee. Not only did each product in a pair have to be similar to its counterpart, but the pairs themselves had to be similar across locations. Consequently, the sample of product pairs that was common to both Tennessee and Florida was exceptionally small.

Secondary Hypothesis Test

With a sample of only six premium pairs, a Wilcoxon test is inapplicable to this situation. The critical value for a two tailed test for a sample size of six is 0, and since the Wilcoxon test will only reject the null hypothesis if the test statistic is less than the critical value, this test was not conducted. While the inability to conduct a test was not the desired outcome for this portion of the thesis, information can still be gained. Comparing premiums in two different locations was intended to provide a more accurate measure of how income affected the
willingness to pay more for domestic products. While this method was anticipated to have significant advantages over conducting surveys in two locations, it ultimately proved unworkable. Future researchers should bear in mind that while revealed preference methods can overcome some of the drawbacks of surveys, they also have a unique set of weaknesses. Once a product pair is found in one location, it is extremely difficult to duplicate the exact same product pair in another location of the country. As a general statement, researchers are cautioned to remember that best method of data collection is determined by many factors, and feasibility should be given significant weight.

**Conclusion**

In summarizing this section of the thesis, several points must be mentioned. First, the revealed preference method of consumer willingness to purchase higher priced domestic products should be used in conjunction with traditional survey based methods. The revealed preference method has the drawback of a limited product pool, and the survey based methods are only able to measure stated preference. To revisit the literature review, a CETSCALE uses a variety of questions from survey participants to gauge how strongly a certain group of consumers prefer domestic products over foreign offerings.

While this is useful, the results of the revealed preference analysis can be used to supplement these findings. Even though the revealed preference method has the drawback of a small sample pool, it can still be used to determine whether consumers actually are following
their stated indications that they would prefer higher priced domestic products over imported ones.
Chapter 4
Summary and Recommendations

A Brief Summary

In the introduction to this thesis, it was stated that the goal of the firm is to maximize profit and that profit is a function of both revenue and cost. Due to the fact that an analysis of the cost of both domestic and foreign production is better left to individual firms, this research has focused on the price difference between domestic and foreign products.

The literature review has shown that, in general, there exists a strong propensity for domestic consumers to prefer domestic products over foreign imports. This has been expressed by the support for domestic production (Shimp & Sharma, 1987; Vida & Reardon, 2008). Not only do many consumers have a bias in favor of domestic producers, they have a bias against certain foreign producers (MadeInUsa, 2009). In general, it can be said that when only stated preferences were analyzed, the current body of research seems to indicate that consumers tend to prefer domestic products over similar foreign imports.

However, it has been noted that foreign production is frequently less costly than domestic production (Farelle, 2004). Studies regarding the effect of price on a consumer's decision to purchase domestic products were difficult to find, so the researcher attempted to draw parallels between the moral duty of purchasing American-made products and the moral argument of purchasing socially responsible products such as "Fair Trade" and organic products. Even when the loose parallels between socially responsible products and American-made products are made,
research into the effect of price on the decision to purchase socially responsible products is of little value to firms considering domestic production. Current research has yet to reach a consensus on whether demand for socially responsible products is elastic, as shown by Delsmacker, Driesen, & Rayp (2005), or inelastic, as demonstrated by Arnot, Boxall, & Cash (2006).

As applied to a firm considering domestic production, the current body of research could be summarized by saying that:

- Consumers generally prefer domestic products over same priced imports.
- There is insufficient research regarding the effect of price on this preference for domestic products.
- There is insufficient revealed preference research to corroborate the findings of research analyzing stated preference.
- The research in similar areas has yet to reach a conclusion regarding the effect of price on domestic product preference.

**Contribution to Research**

In order to make a contribution toward furthuring the knowledge in these areas, this research used a revealed preference method that analyzed the price differences between highly similar domestic and foreign production. After collecting products from several locations in the Southeast as well as online, it was determined that domestic products generally command a premium over similar foreign imports.
The conclusions of this research are in line with the current findings of other researchers who have found that consumers prefer domestic products, but this research also suggests that consumers are willing to pay more for domestic products. These findings reinforce the conclusions of other researchers who have measured a general bias in favor of domestic products.

Advice to Researchers

With regards to future researchers, there are two issues that must be discussed. First, researchers should remember the critical importance of deciding upon a data collection method. In contrast to survey based methods, the revealed preference method of data collection yielded a smaller sample size. While this method should not be used by itself, it serves an invaluable function by complementing survey based research. The revealed preference method will allow future researchers to compare survey results to actual purchasing decisions.

When formulating data collection measures, future researchers should be aware of the most commonly used methods with regards to the topic studied. While these methods are proven, the use of a different collection process can augment current findings by bringing a different set of advantages to the current body of knowledge. For example surveys can indicate what would pay for a product line that has not yet been launched. If a firm was contemplating launching a new product line, revealed preference studies give an indication of what consumers are paying for domestic products.
However, it is likely that the specific product line may not be included in the current body of products. Thus a survey can be used to estimate willingness to pay for a product that is not represented in the revealed preference study. By comparing the survey responses to the results of the revealed preference study, researchers for the firm can have a good idea whether the stated preference for a new product line is similar to the revealed preference for current products.

The second point that must be discussed is the effect of price in determining a consumer's potential to purchase domestic over foreign products. It is a fundamental law of economics that as the price of a product increases, the quantity demanded of the product decreases. While an initial bias in favor of domestic products has been well established, it is suggested that future research focus on how price can influence this decision.

**For Firms**

Based on previous research, it is reasonable for businesses to expect that consumers will prefer domestic products over similar, equally priced foreign products. However, one of the main reasons for producing abroad is the ability to take advantage of the lower cost of production which leads to a lower price for the consumer. The findings that consumers are willing to pay more for domestic products is of critical importance to businesses.

If consumers only had a preference for domestic products, but were unwilling to pay more for them, a firm would not increase profits by incurring the costs of domestic production. Consumers would simply seek out other businesses where they could buy the lower priced
imports. By supporting the idea that consumers will pay more for domestic products, the
management question is transformed. The question is no longer "Where can a specific product be
produced most cheaply?" The slightly more complex question is now a balancing act between the
increased costs of domestic production and the increased price and revenue revenue associated
with domestic production.

This question, however, is product specific; it is also beyond the scope of this research.
The market that a producer caters to will determine if the increased costs of domestic production
are justified by increased revenue. The estimation of cost differences between domestic and
foreign production is best suited to individual firms. Likewise, specific businesses have the data
necessary to estimate demand curves for their products. This research is not intended to answer
any product or industry specific questions. Instead, it is intended to remind firms that in some
instances, a higher cost of production can be compensated for by an increased selling price.
Appendix A

Paired Prices Table*

<table>
<thead>
<tr>
<th>Product</th>
<th>Foreign Price</th>
<th>Domestic Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear ¾ Inch Tape / ft</td>
<td>.008</td>
<td>.024</td>
</tr>
<tr>
<td>Aluminum Foil / ft sq</td>
<td>0.07</td>
<td>0.037</td>
</tr>
<tr>
<td>Sleeping bag 30-50F</td>
<td>32.97</td>
<td>19.97</td>
</tr>
<tr>
<td>Permanent Marker</td>
<td>.47 per</td>
<td>.72 per</td>
</tr>
<tr>
<td>Mop Pads / 10 pk</td>
<td>4.47</td>
<td>3.28</td>
</tr>
<tr>
<td>Diapers / 82 pk</td>
<td>15.97</td>
<td>13.97</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product</th>
<th>Foreign Price</th>
<th>Domestic Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper Towel / ft sq</td>
<td>.0253</td>
<td>.019</td>
</tr>
<tr>
<td>Pine Floor Cleaner / oz</td>
<td>.05125</td>
<td>.07425</td>
</tr>
<tr>
<td>Sticky Notes</td>
<td>.021</td>
<td>.017</td>
</tr>
<tr>
<td>Pencil</td>
<td>.047</td>
<td>.184</td>
</tr>
<tr>
<td>Craft Glue / oz</td>
<td>.695</td>
<td>.7425</td>
</tr>
<tr>
<td>Combination Lock</td>
<td>3.37</td>
<td>3.77</td>
</tr>
<tr>
<td>Fishing Line 15lb /yd</td>
<td>.0057</td>
<td>.0095</td>
</tr>
<tr>
<td>Angle Broom + Pan</td>
<td>6.29</td>
<td>9.99</td>
</tr>
<tr>
<td>Tape Measure 25ft</td>
<td>8.98</td>
<td>13.97</td>
</tr>
<tr>
<td>Framing Hammer</td>
<td>26.98</td>
<td>28.98</td>
</tr>
</tbody>
</table>
### Appendix A Continued

**Online**

<table>
<thead>
<tr>
<th>Product</th>
<th>Foreign Price</th>
<th>Domestic Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>.9999 Fine 1oz gold coin</td>
<td>1,839.39</td>
<td>1,868.49</td>
</tr>
<tr>
<td>16oz hammer</td>
<td>19.49</td>
<td>19.95</td>
</tr>
<tr>
<td>Needle Nose Pliers</td>
<td>9.98</td>
<td>19.95</td>
</tr>
<tr>
<td>20pc Stainless Steel Flatware</td>
<td>29.97</td>
<td>84.96</td>
</tr>
<tr>
<td>14&quot; Skillet Non-stick</td>
<td>29.95</td>
<td>49.50</td>
</tr>
<tr>
<td>Mens Jeans Regular</td>
<td>11.97</td>
<td>35</td>
</tr>
<tr>
<td>9&quot; Cake Pan Round</td>
<td>6.47</td>
<td>15.95</td>
</tr>
<tr>
<td>Set of 4 Measuring Spoons</td>
<td>1.00</td>
<td>9.00</td>
</tr>
<tr>
<td>Metal Yard Stick</td>
<td>14.99</td>
<td>7.18</td>
</tr>
<tr>
<td>Wood Handle Shovel</td>
<td>14.98</td>
<td>23.50</td>
</tr>
</tbody>
</table>

**Johnson City**

<table>
<thead>
<tr>
<th>Product</th>
<th>Foreign Price</th>
<th>Domestic Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duct Tape</td>
<td>0.101</td>
<td>0.103</td>
</tr>
<tr>
<td>Paint Brush 2&quot;</td>
<td>6.980</td>
<td>7.980</td>
</tr>
<tr>
<td>Clear Ball Shower Knob</td>
<td>6.97</td>
<td>11.98</td>
</tr>
<tr>
<td>Pencils</td>
<td>0.047</td>
<td>0.18</td>
</tr>
<tr>
<td>Combination Lock</td>
<td>3.59</td>
<td>4.89</td>
</tr>
<tr>
<td>Coloring Crayons</td>
<td>0.99</td>
<td>1.49</td>
</tr>
<tr>
<td>Sticky Notes</td>
<td>0.021</td>
<td>0.016</td>
</tr>
<tr>
<td>15yd Packing Tape</td>
<td>1.880</td>
<td>2.88</td>
</tr>
<tr>
<td>10lb Fishing Line/ yd</td>
<td>0.00260</td>
<td>0.00570</td>
</tr>
<tr>
<td>Floor Cleaner/oz</td>
<td>0.0441</td>
<td>0.0664</td>
</tr>
<tr>
<td>Tape Measure</td>
<td>6.98</td>
<td>19.97</td>
</tr>
</tbody>
</table>

* All prices are listed in dollars.
## Appendix B
### Adjusted Premium Set

<table>
<thead>
<tr>
<th>Product</th>
<th>Import Premium</th>
<th>Domestic Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal Yard Stick</td>
<td>0%</td>
<td>-52.10%</td>
</tr>
<tr>
<td>Aluminum Foil</td>
<td>0%</td>
<td>-47.14%</td>
</tr>
<tr>
<td>Sleeping bag 30-50F</td>
<td>0%</td>
<td>-39.43%</td>
</tr>
<tr>
<td>Mop Pads</td>
<td>0%</td>
<td>-26.62%</td>
</tr>
<tr>
<td>Paper Towel</td>
<td>0%</td>
<td>-24.90%</td>
</tr>
<tr>
<td>Sticky Notes</td>
<td>0%</td>
<td>-23.81%</td>
</tr>
<tr>
<td>Sticky Notes</td>
<td>0%</td>
<td>-19.05%</td>
</tr>
<tr>
<td>Diapers</td>
<td>0%</td>
<td>-12.52%</td>
</tr>
<tr>
<td>.9999 Fine 1oz gold coin</td>
<td>0%</td>
<td>1.58%</td>
</tr>
<tr>
<td>Duct Tape</td>
<td>0%</td>
<td>1.98%</td>
</tr>
<tr>
<td>16oz hammer</td>
<td>0%</td>
<td>2.36%</td>
</tr>
<tr>
<td>Craft Glue</td>
<td>0%</td>
<td>6.83%</td>
</tr>
<tr>
<td>Framing Hammer + Starter</td>
<td>0%</td>
<td>7.41%</td>
</tr>
<tr>
<td>Combination Lock</td>
<td>0%</td>
<td>11.87%</td>
</tr>
<tr>
<td>Paint Brush 2&quot;</td>
<td>0%</td>
<td>14.33%</td>
</tr>
<tr>
<td>Combination Lock</td>
<td>0%</td>
<td>36.21%</td>
</tr>
<tr>
<td>Pine Floor Cleaner</td>
<td>0%</td>
<td>44.88%</td>
</tr>
<tr>
<td>Coloring Crayons</td>
<td>0%</td>
<td>50.51%</td>
</tr>
<tr>
<td>Floor Cleaner/oz</td>
<td>0%</td>
<td>50.57%</td>
</tr>
<tr>
<td>Permanent Marker</td>
<td>0%</td>
<td>53.19%</td>
</tr>
<tr>
<td>15yd Packing Tape</td>
<td>0%</td>
<td>53.19%</td>
</tr>
<tr>
<td>Tape Measure 25ft</td>
<td>0%</td>
<td>55.57%</td>
</tr>
<tr>
<td>Wood Handle Shovel</td>
<td>0%</td>
<td>56.88%</td>
</tr>
<tr>
<td>Angle Broom + Pan</td>
<td>0%</td>
<td>58.82%</td>
</tr>
<tr>
<td>14&quot; Skillet Non-stick</td>
<td>0%</td>
<td>65.28%</td>
</tr>
<tr>
<td>Fishing Line 15lb /yd</td>
<td>0%</td>
<td>66.67%</td>
</tr>
<tr>
<td>Clear Ball Shower Knob</td>
<td>0%</td>
<td>71.88%</td>
</tr>
<tr>
<td>Needle Nose Pliers</td>
<td>0%</td>
<td>99.90%</td>
</tr>
<tr>
<td>10lb Fishing Line/ yd</td>
<td>0%</td>
<td>119.23%</td>
</tr>
<tr>
<td>9&quot; Cake Pan Round</td>
<td>0%</td>
<td>146.52%</td>
</tr>
<tr>
<td>20pc Stainless Steel Flatware</td>
<td>0%</td>
<td>183.48%</td>
</tr>
<tr>
<td>Tape Measure</td>
<td>0%</td>
<td>186.10%</td>
</tr>
<tr>
<td>Mens Jeans Regular</td>
<td>0%</td>
<td>192.40%</td>
</tr>
<tr>
<td>Clear ¼ Inch Tape</td>
<td>0%</td>
<td>200.00%</td>
</tr>
<tr>
<td>Pencils</td>
<td>0%</td>
<td>282.98%</td>
</tr>
<tr>
<td>Pencil</td>
<td>0%</td>
<td>291.49%</td>
</tr>
</tbody>
</table>

* Multiple listings of the same product indicate that that product was compared in different geographic areas.
Appendix C

Normality Illustrations

Histogram (n=36)

Normal Quantile Plot (n=36)
Appendix D

Wilcoxon Ranked Sum Test

<table>
<thead>
<tr>
<th>Wilcoxon Signed Rank Test</th>
<th>Import Premium</th>
<th>Domestic Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>0</td>
<td>0.50536</td>
</tr>
<tr>
<td>Observed Median Difference</td>
<td>-0.50536</td>
<td></td>
</tr>
<tr>
<td>Predicted Median Difference</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>S−</td>
<td>568</td>
<td></td>
</tr>
<tr>
<td>S+</td>
<td>98</td>
<td></td>
</tr>
<tr>
<td>Test Statistic</td>
<td>90.5</td>
<td></td>
</tr>
<tr>
<td>α</td>
<td>0.005</td>
<td></td>
</tr>
<tr>
<td>P(T≤t) one-tailed</td>
<td>0.0001147426</td>
<td>0.0002294853</td>
</tr>
<tr>
<td>P(T≤t) two-tailed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critical Value</td>
<td>&gt; 109</td>
<td></td>
</tr>
</tbody>
</table>

* The median premium for domestic products is 50 percent.
Appendix E

Sample Differences Histogram
Appendix F
Large Sample Wilcoxon

\[ \mu_W = \frac{n(n+1)}{4} \]

\[ \mu_W = \frac{36(36+1)}{4} \]

\[ \mu_W = 333 \]

\[ \sigma_W = \sqrt{\frac{(n(n+1)(2n+1)}{24} \times 0.5} \]

\[ \sigma_W = \sqrt{\frac{(36(36+1)(2*36+1)}{24} \times 0.5} \]

\[ \sigma_W = 63.647 \]

\[ Z = \frac{W - \mu_W}{\sigma_W} \]

\[ Z = \frac{98 - 333}{63.647} \]

\[ Z = -3.69 \]
Appendix G
T-test of Mean Premium

Ho: The mean domestic premium is less than or equal to zero.

\[ \text{MDP} \leq 0 \]

H1: The mean domestic premium is greater than zero.

\[ \text{MDP} > 0 \]

\[ n = 36 \]
\[ s = .883 \]
\[ \bar{x} = .602 \]

Hypothesized \( \mu = 0 \)
\[ a = .01 \text{ in one tail} \]
\[ \text{df} = n-1 \]
\[ \text{df} = 36 - 1 \]
\[ \text{df} = 35 \]

Critical Value = 2.72
\[ t = (\bar{x}-\mu) / (s/\sqrt{n}) \]
\[ t = (.602-0) / (.883/6) \]
\[ t = 4.09 \]

Reject Ho.

On average, domestic products do carry a premium over similar foreign imports.
Bibliography


