An International Comparative Study Of Per Capita Consumption Of Import: Implications For U.S-Japan Trade

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Abstract

This paper discusses the per-capita consumption of imports aspect of international trade. A research hypothesis is tested to investigate if there is a significant difference among G-7 countries in per-capita consumption of imports and the implication of the testing results for the U.S. - Japan bilateral trade deficit. The results of the ANOVA and the Kruskal-Wallis test yield insignificant variation in per-capita consumption of imported goods/services among the G-7 countries. The study recapitulates the reason(s) for the U.S. trade deficit with Japan and essentially states that factors other than trade barriers and restrictions cause the U.S. trade deficit with Japan. While this result may initially seem counterintuitive and inconsistent with popular wisdom, it may actually help uncover the true causes for the sustained trade deficit with Japan.

Introduction

*A*s the trend of globalization continues and as governments of all types espouse, either willingly or unwillingly, the paradigm of free trade, theories and policies pertinent to international competitiveness are receiving greater attention from academicians, business practitioners, and policy makers. One of the central issues highlighting an area that deserves greater attention is the U.S. - Japan bilateral trade relation. The U.S. balance of trade, especially the U.S. trade deficit with Japan, is frequently the subject of debate among scholars, politicians, and the general public,. It has been asserted that the reason for the deficit is due primarily to the Japanese import restrictions for imported goods and services. Thus, it is a matter of "unfair competition." Since the 1980s,

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when the U.S. trade deficit worsened, the public support for free trade has faded away. U.S. politicians and academicians, especially journalists, began to focus intensely on the "unfair practices" of U.S. trading partners, particularly Japan.

The general picture of traditional support for maintaining free trade gets muddled when dealing with Japan. One of the questions in a public opinion poll was, "All in all, do you think trade with other countries, both buying and selling goods, helps the U.S. economy, or hurts the U.S. economy?", to which the general public replied, with increasing reluctance over the years, that it helps. When "Japan" was substituted for other countries in the same question, public sentiment skewed the other way (Phelps, 1993)

Some recent studies look at the difference in business strategies between American firms and

Japanese firms as a cause of U.S. trade deficit with Japan. It is argued that the U.S. will lose even on a level playing field when trading with Japan. The reason for this is because the goals of Japanese firms, unlike their U.S. counterparts whose goal is to maximize profits, are to maximize long-term growth, market share, and employee welfare, or promote company prestige. As a result of these goals, Japanese firms will sell more goods at lower prices, which will make their goods more competitive comparing with the American as well as European counterparts' (Blinder, 1992).

A second line of research compares the demand for imports and exports in Japan and the United States. Using a standard model of import and export demand, Deyak, Sawyer, and Sprinkle (1993) examined the trade flows of both the U.S. and Japan. One result of this study is consistent with the previous research findings that the price as well as income elasticity of demand in the two countries are significantly different. According to the authors, "the U.S. imports are relatively more elastic in the long run with respect to all economic variables, any given change in income and/or relative price will generate a relatively large change in U.S. imports." (Deyak, Sawyer, and Sprinkle, 1993).

Lutz (1994) conducted a research to determine the comparative level of effective protection imposed in industrialized countries. The study, using multiple regression technique, analyzed the relationship between per capita level of imports of manufactured goods, and several explanatory variables: population, per capita GNP, time, and number of years of membership of EFTA. The results indicate that larger countries have imported manufactured goods relatively less than smaller countries. It further argues that countries with larger population normally have a lower need for manufactured imports. Additionally, countries with higher per capita income level will be able to import more per person than countries with lower levels. Finally, less industrialized countries have a greater propensity to import manufactured goods because of the limited domestic supply.

In spite of the rich and extensive body of work which exist in the area of U.S. - Japan bilateral trade relation, there has been a dearth of research in the comparative study of per capita consumption of imports. Most research efforts have been directed toward the overall balance of trade of a country. The issue of difference in per capita consumption has been either conspicuously neglected or simply assumed to be either insignificant or nugatory.

The purpose of this paper is to conduct an international comparative study of per capita consumption of imports of the G-7 countries. Specifically, an ANOVA model will be constructed to test the hypothesis that there is no difference among the G-7 countries in per capita consumption of imports. Then, a Kruskal-Wallis test, the nonparametric alternative to ANOVA, will be performed using the same data. Therefore, if there is significant difference among the G-7 countries in per capita consumption of imports, then the Tukey test will be used to identify the location of the inequality. Finally, the implications of the empirical findings for international managerial practices and future research are discussed.

Analysis

Before going into the statistical details of the proposed hypothesis tests, a brief overview is useful to highlight the rationale for using the per capita consumption of import to analyze U.S. - Japan trade relations. If, as it has been often cited by large majorities in the U.S., that the Japanese have unfair trading policies and unfairly restrict the sale of American products, then the Japanese per capita consumption of imported goods should be significantly different from those of the other G-7 countries, and particularly different from that of the U.S.

Despite the enormous popularity of this "unfair trading practice" perspective, however, the

theories and models utilized in this perspective are largely inadequate for accommodating or explaining the true reasons for trade deficits with Japan. This is because the difference in population size, and in turn, imports per capita, has not been taken into consideration. It is critical to note that given the relative similarity in per capita income and the difference in population size, it is only reasonable and rational to look at the issue on the per capita basis.

An important part of the analysis involves the use of ANOVA and Kruskal-Wallis tests (Anderson, Sweeney, and Williams, 1999). One can use these tests to determine whether the per capita consumption of imports is different among the G-7 countries. Whether the differences are statistically significant is a question answered with the aid of the above mentioned tests. Like other hypothesis-testing procedures, these tests compare sample results with those that are expected when the null hypothesis is true. The hypotheses for the ANOVA test are:

Ho: $U1 = U2 = U3 = U4 = U5 = U6 = U7$
Ha: the U's are not all equal

Where: Ho is the null hypothesis
        Ha is the alternative hypothesis
        U's are the treatment means

The null hypothesis states that the means for the import consumption per capita of the seven countries are equal. The research hypothesis charges that at least one or the seven countries is significantly different from the others.

The ANOVA model was constructed using time series data for the G-7 countries, the U.S., Japan, Germany, Italy, France, Canada, and United Kingdom. These data were compiled for imports and population for the period 1966 through 1996. Then per capita consumption of imports was calculated as a quotient for each country (IMF, 1997).

The F-Test at a 1% level of significance led to the acceptance of the null hypothesis and to

the conclusion that the difference among the G-7 countries in import consumption per capita is statistically insignificant. The result of the ANOVA test is summarized and reputed in Table 1.

Table 1
ANOVA results

Source	d.f.	Sum of Squares	Mean Square	F-Ratio
Between	6	7.197E+07	1.999E+07	2.07
Within	203	1.174E+09	5,782,953	
Total	209	1.246E+09		

The Critical F [1%, 6, 203] = 2.90

Since the calculated F-Ratio is less than the critical F value at a 99% confidence level, i.e., 2.07 is less than 2.90, the null hypothesis cannot be rejected. Failure to reject the null in this case implies that the difference among population means is statistically insignificant.

The primary underlying assumption of the ANOVA is thus that the populations under study are normally distributed with equal variance. There is no indication that the populations are not normally distributed. However, it is nonetheless scientifically sound to also run the Kruskal-Wallis test, the nonparametric alternative to ANOVA, which does not require the assumptions of normality and equal variance. The hypotheses of the Kruskal-Wallis test are:

Ho: $U1 = U2 = U3 = U4 = U5 = U6 = U7$
Ha: the U's are not all equal

Where:
        Ho is the null hypothesis
        Ha is the alternative hypothesis
and
        U's are the population means.

We can now perform the Kruskal-Wallis test, using the same data for the G-7 countries. The test, once again, will determine whether the difference among seven population means is sta-

tistically significant. The result of the Kruskal-Wallis test was summarized and reported in Table 2.

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Table 2.
Kruskal-Wallis Test Result

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Sum	d.f.	Sum of Squares	Mean Square	H Value
Between	6	112,708	18,784.7	5.79
Within	203	659,024	3246.42	
Total	209	771,732		

The critical H value (x squared) = 16.812

The Chi-square test at a 1% level of significance led to the acceptance of the null hypothesis and to the conclusion that the difference is insignificant, i.e. since 5.79 is less than 16.812, we fail to reject the null hypothesis.

Conclusions

The empirical findings presented here in this paper - that the difference in the per capita consumption of imports among the G-7 countries is insignificant - suggest that the Japanese consume the same amount, or the same level, of imported goods compared with other G-7 countries. This implies that the Japanese might not have unfairly restricted the sales of other countries' products to Japan, and the charge against them for unfair trading practices may be biased and untrue. If the charge against the Japanese for the unfair trading practices is true, then empirically what one should and will find is that the Japanese per capita consumption of imported goods may be significantly lower (different) than that of the other G-7 countries, and that is not supported.

One reason among others, for the U.S - Japan trade deficit, may be caused by the difference in population size in the two countries. One of the basic tenets of demand theory is that population serves as one of the demand determ-

inants. The larger the population, ceteris paribus, the higher the demand.

Suggestions for Future Research

The findings of this study should stimulate further research in the area of per capita consumption of imports and perhaps generate and enhance unique insights into the U.S. - Japan bilateral trade relation scenario. It will be the challenge of the future research to study and uncover the impact of population size on imports. A larger sample size with more countries included might allow one to obtain a clearer picture of the issue.

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