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Import Elasticity of Tea: A Case of Pakistan

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Abstract

Pakistan is second largest importer of tea. It is based on the fact that negligible part of the consumption of tea is produced domestically. The import analysis of tea is significant to check the import bill. The paper empirically investigated the determinants of import of tea using annual time series data for the years 1977-2009 at the national level. We find that import of tea is positively influenced by GDP, domestic tea consumption and human population. While the domestic price of the tea and import duty on tea negatively impacts the import of tea. The findings indicate that import of tea cannot be significantly controlled by adjusting the variables of domestic price and import duty on tea. The point to the need for the policy makers is to decrease the import bill by changing the consumption behavior of the people and introducing the substitutes of tea which are domestically available.

Keywords: Imports, Pakistan, Tea, International Trade.

1. Introduction

The economic growth in Pakistan has been accompanied by fast expansion in food intake and a significant increase in non-food items. Tea is the staple item used as beverage at all levels in the society. The bulk use of tea plays a significant economic role in a number of exporting and importing countries. Pakistan is the second largest importer of tea after United Kingdom. Annually 140-150 tones of tea is being imported with a total cost of Rs.8.9 billion that is heavy burden to the national exchequer. Although a significant part of it is smuggled in to Pakistan through the borders of Khyber Pukhtoon Khawa and Balochistan. The tea consumption may further increase in coming years due to urbanization and high population growth. Pakistan is likely to become the world's largest importer of tea. Domestic production of tea did not give desired results despite the efforts by National Tea Research Institute Islamabad. In the food group of imports the share of tea is more than 12 percent. The import of tea is mainly coming from Kenya, Indonesia, Sri-Lanka and Bangladesh.

Pakistani imports and its pattern at the aggregate level is estimated extensively in literature. The import volumes and patterns can be explained by demand and supply factors through trade policy, liberalization of trade and globalization. The effects of macroeconomic variables on imports at the aggregate level have also been investigated (Sarmad 1989; Sinha 1997; Arize, et. al. 2004). These studies have shed light on the relationship between imports and external factors such as trade policy, liberalization and macroeconomic variables. Despite the interest in depressing force for import of consumer items, comparatively little empirical research exists on the relationship between import of tea and the related variable.

Nelson (1991) questioned the analysis of consumer demand for food at aggregated level explaining that aggregation of food items leads to explanatory problem. It needs new insight of the demand for food items separately. The sum of physical quantities used as a measure of demand, in the literature is theoretically arbitrary and potentially misleading. It becomes more complex when goods are heterogeneous and substitutes. Following these view, Bergtold, et. al. (2004) estimated the own-price and expenditure elasticities of 49 processed food categories. The use of disaggregated data for food categories and estimation of unconditional elasticities account for differences in own-price expenditure elasticities. The study suggested that providing more

disaggregated product level demand elasticities could help in the economic analysis of the issues like impact of public policy on imports (see also Schmitz and Seale Jr. 2002).

There is little formal evidence as to whether the import of tea may be decreased by trade policy. Among different factors affecting import of tea, the link between import duty, domestic consumption, population, economic growth and volume of import of tea warrants particular attention. Therefore it is important to understand the nature and determinants of import of tea in Pakistan. The empirical evidence may have important policy implications for designing and developing strategies to decrease the import of tea.

The paper represents a step towards explaining this issue by empirical examining of effect of key factors on import of tea. We use data from Fifty Years of Pakistan Economy by Federal Bureau of Statistics which contains disaggregated data for import of food items. We deliberately choose disaggregated approach as the behavior of aggregate import data on food often obscures the importance of macroeconomic factors on import of tea. In this way we will increase the likelihood of capturing the true behavioral relationship between import of tea and macroeconomic variables, which may not be detected at aggregate level.

2. Theoretical Considerations and Hypothesis

The theoretical foundations for empirical analysis of determinants of import of tea lie in the conventional trade theories based on the Heckscher-Ohlin (O-H) framework. According to H-O theory, factor endowments determine comparative in production and exports. A country should export those products that use intensively the factors with which the country is well endowed. That is reflected by the fact that export market of tea is dominated by five countries, i.e. Kenya, Sri-Lanka, China, Indonesia and India which export 80 percent of the world tea. Alternatively the countries with less endowment in the said factor import that product. Despite its simplifying assumptions, notably no economies of scale, identical production function and preferences across countries are accounted. The H-O theory seems to explain much of developing countries pattern of trade. In addition to the emphasis that traditional trade theory places on comparative advantage, new trade theories also draw attention to the role of imperfect competition, economies of scale and product differentiation. The oriental modeling shows that the interaction between economies of scale and trade costs encourages firms to expand their trade.

Tinbergen (1946) opined that for analysis of imports, theoretically the theories of international trade are very important. They may be of great use if further developed to explore the import pattern of nations at disaggregated level.

The rapid globalization of trade and production has incorporated the relaxation of trade barriers into trade models. Endogenous growth theories have highlighted the role of innovation in explaining the trade flows. They stressed the importance of innovation in developing new products. In our case of tea, a variety of the new tastes in blending of tea has been emerged in the last two decades.

The consumer preferences and consumption pattern are also the factors driving demand for tea. The consumption of tea also is influenced by the regional differences, culture and tradition. It is more consumed in hilly areas and northern areas of Pakistan. Similarly, it is more consumed in urban areas as compared to rural ones. Tea consumption tends to increase with education (see also CCP 2008 for China).

In the consumer characteristics, the age, gender, income, habits and profession may affect the consumption of tea. At the macro level foreign exchange reserves (Arize, et. al. 2004 for overall imports) currency exchange rate, population size, rural urban disparity, average temperature of the country, composition of age group and income correlates with overall tea consumption (CCP 2008). The consumption demand for tea also depends upon the conception like its use reduces the incidence of particular diseases. Although the conception that use of tea reduces the incidence of particular disease like cancer is negated by Nagano, et. al. (2008).

There is an increasing concern in the international trade literature that no single theory can clearly account for the imports and exports in developing countries. The existing theoretical models provide useful ideas and foundations for empirical modeling. We take an eclectic approach in this study, and consider an empirical model that includes a number of different explanations for import of tea. We will first discuss the determinants of imports theoretically that will be explored in our empirical model.

Based on the consumption theory, the GDP is expected to influence the consumption of tea which ultimately affect the import of tea positively (Arize, et. al. 2004 for aggregate imports). The domestic price of tea may affect the import of tea in two ways. The higher prices of tea in the economy may result into more import of tea if the price in international market is lower. On the other hand if the domestic prices are at par with international prices, under the law of demand, lesser will be the demand for import of tea. The prices of substitutes to the tea, they are generally coffee and green tea (*Kehwa*) may also affect the demand for tea (CCP 2008 for China). But both of these items are used in a very insignificant ratio so we have not included them in our analysis.

Tea is widely consumed at the household level which results into high consumption at national level. Along with it the tea is smuggled to Afghanistan. The substitutes of tea, i.e. coffee and green tea (*Kehwa*) are consumed in a slight ratio of tea consumption, so it is hypothesized that consumption of tea would result into increased imports.

The import duties are still widely used in the developing economies to control the imports. It is hypothesized that import duty, i.e. custom duty on tea would result into decreased demand for imports in Pakistan.

The human population and its composition affect the demand and consumption of tea like other food items (CCP 2008). The composition of population differently affects the demand for tea. The children take tea rarely, oppositely to older persons who take tea more regularly. Similarly the females take tea more than the males. In our analysis we have included the human population in the age group of more than 10 years to see its impact on demand for tea and ultimately on import of tea. It is expected that the human population in this age group would affect the import of tea positively.

3. Review of Literature

The literature about import elasticities of food items goes back to 1940s. A much earlier study by Tinbergen (1946) probed the price elasticities of imported food items along with their substitution elasticities. The analysis attempted to estimate the extent of elasticities of food items and elasticities of substitution and to see whether divergences in elasticities can be explained. The cases for the analysis were beef, pork, mutton, tea, coffee, sugar, barley, corn, hay and oats. It was based on the conceptualization that import demand elasticity depends upon more than one price and it has to know the possibility of regulating exchange rate, balance of payments and volume of employment to adjust the import demand.

Pork imports into Japan are constrained by both the high protection and the strong preferences of Japanese consumers for domestic pork over imported pork. Fabiosa and Ukhova (2000) using two-stage model attempted to estimate aggregate and source-specific import elasticities for pork.

The approach allows substitution between domestic and imported products. The results explained that imported pork has a relatively low income elasticity reflecting consumer's lower quality rating for imported pork compared with domestic pork. Schmitz and Seale Jr. (2002) analyzed the import pattern of Japan's seven most popular fresh fruits (bananas, grapefruits, oranges, lemons and aggregating pineapples, berries, and grapes). The results of the analysis have several implications for Japan. If the Japanese consumers are to increase their expenditures on fresh fruit imports in future, they would spend a larger portion of their budget on the consumption of grapefruits and pineapples than they do currently. Secondly, banana, orange, lemon and

pineapple imports would drop by less than the percentage increase in price. Hence increasing the price charged for these fruits would increase total revenue for the exports. Another important result of the analysis was that Japanese consumers view certain typed of fresh fruits as substitutes.

Yuliando and Akira (2006) estimated the export elasticities of tea with respect to price to increase the export earning of the exporting countries. The important finding was that price elasticities were positive and highest for Indonesia. The rise in the prices of tea by exporting economies may result into export earning of these economies but it may also increase the import bill of a large number of countries like Pakistan. From the results it may be conferred that countries importing tea have the consumer preference for tea and rise in price of tea do not matter for the consumption of tea. CCP (2008) has documented the demand analysis of tea market in China. The study concluded that tea consumption pattern varies with regional differences in consumption pattern and preferences. In the consumption preferences it is concluded that females take tea more than males.

4. Model and Data

According to the hypothesis outlined above, the following model is tested

$$IMP = f(GDP, CON, PRI, DUT, POP) \dots\dots\dots (1)$$

Equation 1 states that the import of tea (IMP) is affected by the GDP, domestic consumption of tea (CON), domestic price of tea (PRI), duty imposed on tea (DUT) and population more than 10 year of age (POP). Adopting a log-liner functional form to directly obtain import elasticity with respect to explanatory variable, the empirical model of equation (1) can be specified as:

$$\ln IMP = \alpha + \beta_1 \ln GDP + \beta_2 \ln CON + \beta_3 \ln PRI + \beta_4 \ln DUT + \beta_5 \ln POP + \mu \dots\dots\dots(2)$$

where μ represents the error term. There is evidence that a two-way relationship may exist between import of tea and consumption of tea at the national level. This suggests that import enhances consumption and in turn, consumption promotes imports. It implies that the estimation of a single equation for imports using OLS method will lead to spurious results. Therefore, the two stage least square (TSLS) model is applied in this study. The data has been taken from Pakistan Economic Survey (various years) by State Bank of Pakistan, Annual Reports by Federal Bureau of Revenue and Fifteen Years of Pakistan Economy by Federal Bureau of Statistics, Pakistan.

5. Empirical Results

Table 1 presents the estimation of equation 2. Most of the results shown in table 1 are consistent with theoretical predictions about the determinants of imports of tea. The coefficients of all explanatory variables are correctly signed and statistically significant.

Table-1 Determinants of Import of Tea

Variables	Coefficients (t-statistics)
ln GDP	1.168 (3.281)**
ln CON	1.391 (2.257)**
ln PRI	-0.153 (-2.914)**
ln DUT	-0.011 (-1.836)*
ln POP	1.178 (1.946)*
Adjusted R-Squared = 0.65	Observations = 32

Dependent variable = ln IMP

Note: * and ** represents the significant level of 10 percent and 5 percent respectively.

The results suggest that domestic consumption is an important factor determining import of tea. That is other factors being constant, one percent increase in domestic consumption of tea would raise the import of tea by 1.39 percent. The higher increase in the import of tea due to increase in consumption may be explained on the fact that a significant part of the total tea imported is smuggled into Afghanistan.

It is estimated that rise in GDP results into increased import of tea (see also Arize, et. al. 2004 for aggregate imports in Pakistan). It corroborates the results by CCP (2008 for China), that is households with the higher income consume 2.2 time more tea than households with lower group. The impact reflects a number of implications, i.e. the increase in GDP results into enhanced purchasing power of the people that results into more consumption of tea along with other food and non-food items. It is important to note that import elasticity of tea with respect to GDP is greater than one. It shows the preference of consumers for consumption of tea by increase in their living standard.

The results show that domestic price of the tea negatively impacts the import of tea. One percent increase in the domestic price of tea would decrease the import of tea by 0.15 percent. The lesser decrease in the import of the tea due to change in domestic price represents the national habit of tea consumption. Despite the fact that tea is non-food item its consumption is slightly affected by the change in price. From the policy point of view, it is important to note that the national consumption behavior of tea is needed to be changed to decrease the import of tea. The fiscal policy in this regard may be somewhat ineffective.

Globalization of trade and implementation of WTO has made the instrument of import duty relatively less effective to control the flow of imports. Our estimates have shown that one percent increase in custom duty on the import of tea would result into decrease in import by only 0.01 percent. It again confirms the conception that the consumption behavior of the Pakistan about tea is not so much related with cost of tea. The people have the custom, habit and traditions for use of tea irrespective of the change in cost and price.

We have included the population of the country (10 years and above) as an explanatory variable for the import of tea. The results revealed that one percent increase in the population would result into import of tea by 1.17 percent. The figures represent the increasing tendency of consumption of tea in the country by growth of population. This result also explains that in coming years there will be higher demand for tea and higher import bill.

6. Conclusion

Based on the time series analysis, this study empirically examines the import elasticity of tea explaining that how macroeconomic variables affect the import of tea at the national level. The impact of factors such as GDP, domestic tea consumption, domestic price of tea, custom duty on import of tea and human population in the age group of more than ten years on import of tea has been tested using the sample of 32 years. The evidence from this study suggest that import of tea is significantly influenced by tea consumption and human population. Both of the results explain the increasing tendency of consumption of tea. The consumer behavior needs to be changed for decreasing the import bill of tea. The process of economic growth of the economy in the form of increase in GDP is also resulting into enhanced consumption of tea.

The domestic price of tea and the custom duty have affected the import of tea very slightly. To adjust these variables to decrease the import bill may not be a good policy option. The findings from this study indicate that it is appropriate to focus on the domestic production of tea and provide the substitutes of tea which are produced domestically. One of them may be domestically produced green tea (*Kehwa*). One possibility is that to change the consumer behavior, national campaign may be launched and media can play an important role in this regard.

The main finding of the study is that to slide down the import of tea, instead of adjusting the macroeconomic variables, there is need for change in the behavior of the national consumption of tea.

References

- Arize, A. C. (2004) Foreign Exchange Reserves and Import Demand in a Developing Economy: The Case of Pakistan. *International Economic Journal*, 18,2:259-274.
- Bergtold, J., E. Akobundu & Peterson E. B. (2004) The FAST Method: Estimating Unconditional Demand Elasticities for Processed Foods in the Presence of Fixed Effects. *Journal of Agriculture and Resource Economics*, 29,2:276-295.
- CCP (2008) Demand Analysis for Tea in China. 18th Session Report of Committee on Commodity Problems (CCP). Hangzhou, China, 14-16 May 2008.
- Fabiosa, J. F. and Ukhova Y. S. (2000) New Aggregate and Source-specific Pork Import Demand Elasticity for Japan: Implications to U.S. Exports. Working Paper No. 00-wp 253. Center for Agriculture and Rural Development. Iowa State University.
- Nagano, J., Suminori. K., Rreston L. & Mabuchi K. (2008) A Perspective Study of Green Tea Consumption and Cancer Incidence, Hiroshima and Nagasaki (Japan). *Cancer, Causes and Controls*, 12,6:501-508.
- Nelson, J. A. (1991) Quality Variation and Quantity Aggregation in Consumer Demand for Food. *American Journal of Agricultural Economics*. 73,4: 1204-1212.
- Sarmad, K. (1989) The Determinants of Import Demand in Pakistan. *World Development*, 17,10:1619-1625.
- Schmitz, T. G. & Seale Jr., J. L. (2002) Import Demand for Disaggregated Fresh Fruits in Japan. *Journal of Agricultural and Applied Economics*, 34,3:585-602.
- Sinha, D. (1997) An Aggregate Import Demand Function for Pakistan. *Atlantic Economic Journal*, 25,1:114.
- Tinbergen, J. (1946) Some Measurements of Elasticities of Substitution. *The Review of Economic Statistics*, 28,3:109-116.
- Yuliando, H. and Akira N. (2006) Supply Management Options for Tea Producing Countries: A Case Study of Indonesia Tea Product and Its Competitors. *Journal of Applied Sciences*, 6,7:3170-3173.