

Export Demand Elasticity of Raw Rubber Export from Sri Lanka.

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ABSTRACT

Rubber is one of the largest foreign exchange earners of the country. This sector recorded 7.64 % growth during 1993-1997 period, which boosted the export earnings during 1995-96 period. However share of rubber export and earning has been declining remarkably over the last few years. With this background, this paper investigates the factors affecting the Sri Lankan rubber export.

For this, Sri Lankan rubber export quantity were analyzed in term of rubber importing to whole world and to specific regions namely USA, Pakistan and Japan using time series data. Secondary data were collected for a time period of twenty five years (1980-2004) and the fitted models were estimated using the Ordinary Least Square (OLS) method.

According to the result, rubber export to whole world showed an inelastic export demand (-0.5584). All the regions studied also showed inelastic export demand. The study discusses some issues to be considered in promoting rubber exports in the country based on elasticities developed.

KEY WORDS: Export demand, Elasticity of demand, Rubber.

INTRODUCTION

Rubber (*Hevea brasiliensis*) production was established in Sri Lanka in 1876 with the planting of rubber plants imported from Brazil. The rubber products manufacturing industry emerged in the 1950s, and it expanded rapidly after the introduction of free trade policies and investment promotion zones in the late 1970s.

Rubber covers land area of 115992 Ha in 2005. The contribution from natural rubber industry to the national economy is substantial. Rs 5137 million were earned as foreign exchange through exporting raw rubber. Further, the sector provides employment to about 500 000 people directly or indirectly. (Source: Rubber Development Department).

The main types of rubber produced in Sri Lanka are Ribbed Smoked Sheet (RSS), Latex Crepe, Sole Crepe and Centrifuged Latex. Production of raw natural rubber was 104.4 KgMn in 2005, although production levels in 1970s have exceeded 155000 metric tones. Frequently depressed global market prices coupled with increasing cost of production, owing to the low yields and poor labor productivity, are some of the main factors that contributed to this decline in raw rubber production (Source: <http://www.crtasl.org>).

The local consumption of raw rubber for value addition was around 54400 metric tons in the year 2004. This accounted for 70% of local production. This may be the one of the reason for decreasing export quantity (source: Rubber development Department, 2004).

Exports play a strategic role in the economic development process of Sri Lanka. Main types exported are Ribbed Smoked Sheet (RSS) and Crepe Rubber (CR). Rubber sector recorded a 7.64% growth rate during 93-97 periods due to the sharp rise in the prices which boost the export earning during

1995-96 period. But in contrast declining world prices have depressed the growth of this sector in 1995-2000 which affected the rubber industry in Sri Lanka. Thus, Sri Lanka's shares in world market have deteriorated.

Table 1: Net Export of Natural Rubber

Country	Net export (2004)
Sri Lanka	37.4
India	71.4
Malaysia	679.9
Thailand	2627.4
Indonesia	1875.1

(Source: Rubber statistical bulletin, 2005).

This emphasizes the low share of Sri Lankan rubber in the world export as shown in table 1. As there is declining trend in the export volume as well as the low share in the world exports, it is important to identify the factors affecting the export of raw rubber.

The specific objective of this study was to:

- I. Determine the export demand elasticity for world as a whole.
- II. Determine the elasticity of export demand for specific regions where rubber is exported.
- III. Suggest strategies to increase the export potential of rubber.

METHODOLOGY

Data collection

Secondary data for a time period of 25 years from 1980 to 2004 were collected. Data were gathered from secondary source including Central Bank Reports (1980 to 2005), Ministry of Plantation Industries and International Rubber Study Group (IRSG).

Analytical Procedure

In order to achieve objectives set out above, this study develops export demand functions for the rubber exported from Sri Lanka to specific (USA, Pakistan and Japan) separately and to the world as a whole.

The traditional framework for analyzing commodity exports is set out by Goldstein and Khan, 1978. (cited in Warr and Frances Wollmer, 1996).

It can be shown as,

$$Q = f(P/P_m, SRP, I, T)$$

Q = quantity of rubber export to the world

P/P_m = Export demand price (F.O.B.) normalize by world natural rubber price (New York) (Rs/Kg)

Deflated by GDP deflator.

SRP = World synthetic rubber price (Rs/Kg)

Deflated by GDP deflator.

I = Average GDP of the selected region/world (Rs billion)

Deflated by GDP deflator.

T = year trend

In this function quantity exported is assumed to be dependent on export price of rubber (F.O.B. price), synthetic rubber price in world market assuming synthetic rubber to be a close substitute to natural rubber, GDP as a proxy for income of the selected countries, and a year treated. All variables were deflated using GDP deflator to remove the effect of inflation.

RESULTS AND DISCUSSION

The quantities of rubber exported to the major importing regions from Sri Lanka were regressed with selected independent variables. Linear, Logarithmic, Lin-log and Log-Lin forms were tested to select the best model. The Linear model was selected for all interpretation.

The suitability of the models were judged based on R² (coefficient of determination), sign of the Parameter estimates compared to the theoretical

expectation, and by the significance of independent variables.

The selected model and OLS estimates for each of the estimated export demand function and the competed export demand elasticity is described below.

Export Demand Function for the World

The export demand elasticity of whole world was -0.584. Export price was significant in the model and the negative sign for its estimate was according to the theoretical expectations. The quantity demanded reduces with the increase of natural rubber price.

Synthetic rubber price was not significant and its positive sign is in accordance with the theoretical expectation. Synthetic rubber is the major substitute to natural rubber.

Income elasticity is negative and significant, contrary to the theoretical expectation.

The trend of rubber export was significant in the model and is negative. The reason for this is obvious. It is due to the increase in domestic consumption which has reduced the volume available for exports.

Japan

The export price was not significant in the model and the negative sign for the estimate is theoretically accepted. The quantity demanded reduces with the increase of the natural rubber price. Export demand elasticity is -0.07631.

The synthetic rubber price was not significant in the model and its positive sign is theoretically accepted. Synthetic rubber is a major substitute for natural rubber.

Income is significant in the model and its positive sign is in accordance with the theoretical expectation. With the increased income, the quantity demanded of natural rubber also has increased in Japan.

The trend of rubber export to Japan was significant. Its sign is positive. Though rubber exports to world as a whole showed a negative trend, the export to Japan has been increase over the years.

Table1: Details of regression.

Country	Price	Synthetic Rubber Price	Income	Year	Elasticity
USA	0.358*	-0.045	-0.00008*	0.035**	0.3563
Pakistan	<0.00001	<0.00001	0.00001	0.001**	-
Japan	-0.054	0.007	0.00005*	0.01**	-0.0763
World	-49.865**	24.836	-0.004**	-2.313**	-0.5584

* Significant at 10%

** Significant at 5%

U.S.A.

The export price was significant in the model and the export demand elasticity is 0.3563. However the positive sign for the estimate is theoretically not accepted.

The synthetic rubber price was not significant in the model and its negative sign also cannot be accepted theoretically.

Income is significant, but not in accordance with the theoretical expectation. Since it has a negative sign.

Trend of rubber export was significant in the model and its sign is positive. There is a positive trend for rubber export to U.S.A.

Pakistan

The export price was not significant in the model and positive sign for its estimate was not in accordance with the theoretical expectation.

Synthetic rubber price was not significant in the model and its positive sign is according to the theoretical expectation.

The income was not significant in the model and it had a negative sign.

The trend of rubber export to Pakistan was significant in the model. It has a positive trend. Sri Lankan rubber export to this region shows a market growth.

CONCLUSION AND POLICY IMPLICATION

The result of the study showed that the rubber export industry of Sri Lanka has become a more challenging today. To withstand the challenge, a well planned strategy is needed.

It is important to have planned programs for the expansion of rubber production. Provide facilities to produce more for growing domestic consumption and also to cater to the export demand of raw rubber.

According to this study export demand elasticity of rubber is inelastic. That is rubber exports are not very sensitive to its export (FOB) price. Because Sri Lanka is a very small country and our rubber export volume is considerably low. Therefore it is essential to have separate marketing plans for each region.

Also local collaboration could provide valuable local market knowledge and government contacts. In some countries this is the only feasible method of securing the market.

It is also important to have close relationship with international companies who have dominated the market in the developed world. By that Sri Lanka can expand the market for Sri Lankan rubber. One should also develop a system to collect and disseminate market information.

Sri Lanka can have rubber promotion bureaus in major marketing regions. Also important for the country to actively participate in the international rubber committee in order to gain the popularity for Sri Lankan rubber with good quality image.

It is much important for Sri Lanka to market rubber in its own brand name in the international market. At the same time it ensures some degree of loyalty both for the brand and for Sri Lankan rubber. For this we should have market research and should launch an exclusive brand of Sri Lankan rubber. Development of Lankaprene, a specific type of rubber developed by Sri Lanka may be one step towards this.

As price elasticity was very low in all regions as well as to the world as a whole, it is important to have trading agreements between major rubber consuming countries specially countries like China where economic growth is tremendous.

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An Assessment of Investor Characteristics in the Colombo Stock Exchange (CSE)

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ABSTRACT

The capital market is the market for securities, where companies and the government can raise long term funds. The capital market includes the stock market and the bonds market. Stock exchange is a place where investors invest their money to buy and sell shares, debentures and other securities. Sri Lanka has one stock exchange and it called as the Colombo stock exchange (CSE).

Colombo stock exchange (CSE) has three branches in Matara, Kandy and Kurunegala, which is the youngest branch among other branches. Stock market is not familiar to majority of people in Sri Lanka. People lack motivation to involve this market. This problem arises due to several factors. In this study an attempt was made to identify the socio-economic factors that affect the participation in Colombo stock exchange, Kurunegala branch. The other objectives of this study were to identify the most preferred investment method among possible investors, and to identify perceptions of share holders about share brokers.

The results indicated that the education level, age and income significantly affect the participation in stock exchange. Sex and investors employment was not found to be significantly affecting the to investment in Colombo Stock Exchange(CSE). This study also revealed that approximately fifty percent of the shareholders were not satisfied about stock broker service. In addition, it was also found that those who did not investing stock market preferred to invest in raffling methods, savings and fixed deposits.

KEY WORDS:-Investment method, Logistic regression, Stock market

INTRODUCTION

The capital market is the market for securities, where companies and the government can raise long-term funds. The capital market includes the stock market and the bond market.

In 2004, Sri Lanka economy registered an annual growth of 5.4% in real Gross Domestic Product (GDP). It is also noteworthy that the Country's per capita GDP exceeded US dollars 1,000 for the first time. With this achievement, it is expected that Sri Lanka would make further progress towards becoming an upper middle income country Investments improved, while savings remained stable in 2004 (Anon 2004).

Stock exchange is a place where investors invest their money to buy and sell shares, debentures and other securities. The Colombo Stock Exchange (CSE) is the organization responsible for the operation of the stock market in Sri Lanka. The Colombo Stock Exchange (CSE) is a company limited by a guarantee established under the companies Act No.17 of 1982. (Anon 2004)

The origins of share trading in Sri Lanka date back to the 19th century. The failure of coffee crops in the late 1870's led the British Planter community to switch to tea. This decision created a need to raise capital required for the establishing of tea plantations and these planters issued shares in Colombo and London, which were culminated in the emergence of the Colombo Share Market in 1896.

Trading of shares in limited liability companies began with the Inception of the Colombo Share Brokers Association (CSBA) in 1896. In 1904, the CSBA changed their name to Colombo Brokers

Association. Initially, the share market consisted mainly of public companies in the plantation sector. The development of tea and rubber plantations in the early 1900's led to the establishment of many commercial companies to provide back-up services to the plantations sector. As a result, such trading companies caused a growth in companies in the commercial sector during the late 1920's.

The Colombo Share Market maintained high levels of activity before independence when shares of companies registered in London, Bombay and Singapore were freely traded in the Colombo market, apart from the locally registered companies. The nationalization of public entities in Sri Lanka, which began in 1958, had a negative effect on stock market activity during the period. The nationalization of plantations in the early '70's led to 105 plantation companies being removed from the share list. By the end of 1976, there were only 76 companies in the share list from 216 companies in 1965. As a result, the share market hit an all time low in the 1970's. The more liberal and open economic policies adopted by the Sri Lankan government in 1977 led to a reversal of the situation in the stock market and saw increased market activity after '77. The share list had expanded to 176 companies by the end of 1983, despite the elimination of plantation companies.

The share market was opened to the public on 2nd July 1984, as the CBA recognized the importance of mobilization of local savings to meet the capital requirements of the growing private sector. A Public Trading Floor was established with the 'Open Outcry' system of trading, instead of the then 'Closed Door' system of trading. The Government formalized

share trading on 2nd December 1985 with the establishment of the 'Colombo Securities Exchange (Guarantee) Ltd., which was later changed to Colombo Stock Exchange (Guarantee) Ltd. on 19th March 1990 and later on Colombo Stock Exchange (CSE) on 15th November 1990. The 1990's saw the automation of the Clearing House of the Exchange with the establishment of the Central Depository System in 1991, move to new premises at the World Trade Centre in 1995 and the automation of trading with the Automated Trading System in 1997. The Colombo Stock Exchange remains the only Stock Exchange in Sri Lanka and one of the leading Exchanges in the region. (Samarakoon, 1998)

However investors among urban communities started active participation in Colombo stock exchange after formalizing the stock exchange in 1984. New automated trading system introduced to Colombo stock exchange in 1997. This method helped to work efficiently and distribute branches throughout the country (Dayananda, 2003).

Then new branches were open in Matara, Kandy, Kurunegala. In the initial stage (1896) small number of people dealt with Colombo Stock Exchange. This share holder number increased after 1984. But share market not familiar to majority of people in Sri Lanka. People lack of motivate to involve this market. This problem severity in countryside areas. This problem arises due to several factors.

Kurunegala is the youngest branch in the branching network. This study was mainly carried out to identify those factors in Kurunegala CSE branch. The other objectives of this study were to identify the most preferred investment among possible investors, and the perceptions of share holders about share brokers.

METHODOLOGY

Data collection

Primary data were collected from 110 people using a pre-tested questionnaire. The method used here was the interview method. The survey covered investors in the kurunegala branch of the Colombo stock exchange, and potential investors around the Kurunegala area. Sixty share holders and fifty potential investors were selected randomly. Sample included shareholders in several categories and potential shareholders in several job categories.

Analytical procedure

The study hypothesized that the investors participation in Colombo stock exchange was associated with the socio-economic factors such as age, income..etc. In order to evaluate the impact of these Socio-economic factors on the investment decision in the stock market, following logistic model was developed.

$$Z = \text{Log} (P_i / 1 - P_i) = \beta_0 + \beta_1 \text{Sex}_i + \beta_2 \text{Age}_i + \beta_3 \text{Income}_i + \beta_4 \text{Edu}_i + \beta_5 \text{Job}_i$$

Where subscript i represents each respondent. Dependent variable, $Z=1$ if respondent was an investor in stock market and 0 other wise.

Table 1-Definition of variables in the model:

Variable	Definition	Categories
Sex	Sex of person	
Age	Age of the Respondent	
Income	Income of the Respondent	
Edu	level of education	0 = Low (O/L or Below) 1 = High (A/L or Above)
Job	Employment of the Person	1 = own work 2 = private 3 = Government

Due to the dichotomous nature of the dependent variable logistic regression model was used to find the socio-economic factors for the participation in the stock market. Further, because of the models' mathematical simplicity and asymptotic characteristics which constrained the predicted probabilities to a range of zero to one. The logit model relates the probability of respondent's participation behavior to a set of investor characteristics based on a cumulative logistic probability function.

RESULTS AND DISCUSSIONS

1. Factors Affecting the Participation in Colombo Stock Exchange

Table 2 - Results of Logistic regression:

	Exp(B)	Sig
edu	11.416	.068**
Income	1.000	.004*
Sex	0.627	.340
Age	0.958	.078**
Job		.740
Constant	1.160	.870

*Significant at 5 percent

** Significant at 10 percent

Table 3 – Hosmer and Lemeshow test:

Step	Chi-square	DF	Sig
1	8.839	8	0.356

Non significant chi-square values in the Hosmer and Lemeshow test indicate that the model is adequate in explaining the participation behavior.

Based on the results obtained, the participation in the stock market is significantly determined by the education level, income and age of the investors.

The most contributing factor was the education level, which had a odds ratio of 11.416, implying that probability of investing by a educated person is 11.416 times than a less educated person.

However, income indicated an odds ratio of 1 implying that probability of investing and not investing between people with high income and low income is not much different. The reason for this

and it will badly affect to the future stock market performance. Specially this is important in a branch like Kurunegala.

Table 4 - Satisfaction of investors about stock brokers:

	Frequency	Percentage (%)
Bad service	28	46.7
Good service	26	43.3
Very good service	06	10.0

Thirty percent of investors indicated that information provisions by stock broker are not up to the standard. They indicated that there should be a proper communication must need among investors and stockbrokers.

But 20%of investors did not mention any weaknesses in stock broker service.

Table 5 - Stockbroker weaknesses:

	Frequency	Percentage
Bad information	2	3.3
Lack of information	16	26.7
Neglect small investors	26	43.3
Be more honesty	03	5
Bad guidance	01	1.7
No problem	12	20

3. Analysis of preference investment method among potential share holders in Kurunegala area

Table 6- Preference investment method:

Investment Method	Frequency	Percentage
Raffling method	23	46
Insurance	01	02
Current accounts	01	02
Savings	14	28
Fixed deposits	08	16
Other methods	03	06

It is clearly shown that the raffling methods, savings and fixed deposits were most preferred investment methods among potential investors.

Raffling methods were the most preferred investment method among potential investors 46%. Savings was preferred by 28% of the investors and 16% preferred fixed deposits as their investment method.

CONCLUSION

The results of this study highlighted education level, income and age of the investors affect the

participation. If that is educated are more keen on investing in stock market than lesser educated. To earn profit in the stock market, the investors should clearly follow the market through media or by other means, identify price fluctuations through various indices etc. Therefore, educated are at an advantage.

The significant age variable implies that younger people tend to move into stock market than the old. The reason may be that younger may be more willing to take risk than the old.

Approximately fifty percent of the investors were not satisfied about stock broker service.

It was found that people who have not invested in stock market prefer raffling methods, savings and fixed deposits for investing money. This may be mainly because they lack knowledge about stock market.

Therefore, It is necessary that relevant parties should be efficient in providing information and other services taking those in to consideration.

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