An analysis of Household Rice Expenditure Patterns in Urban, Rural and Estate Sectors in Sri Lanka: Using MPE Approach

N.J.C. Paraneetharan[1], John Nigel[2] and T. Vinayagathasan[3]

[1]PGIHS, University of Peradeniya, Sri Lanka
[2, 3] Department of Economics and Statistics, University of Peradeniya, Sri Lanka

Keywords: *MPE approach; Rice expenditure pattern; Linear regression; Magnitude*

Introduction

Analysis of household food expenditure patterns is considered an important indicator of economic development in a country, especially meaningful in developing countries where the food expenditure account is a relatively large share of household income (Dunne & Edkins, 2005). Marginal Propensity to Expend (MPE) is a tool to analyse household food expenditure pattern. It measures the proportion of any increment of income that the household desires to spend on consumption. MPE indicates the type of relationship between income and expenditure on a particular food item and provides support for Engel's curve (Haavelmo, 1947).

MPE of a food expenditure function shows how households react differently when income changes. This is defined as the ratio of the change in expenditure on a food item to change in household total income. It is simply the slope of the response curve and the marginal response of consumption to changes in income. MPE of food items can be used to compare consumer behavior between sectors and is relevant to judge the pattern of additional demand (Langemeier & Patrick, 1990).

Objectives

The objective of this study is to examine monthly household rice expenditure patterns in the urban, rural and estate sectors of Sri Lanka.

Methodology

This study used last four of the HIES data sets for the periods 2006/07, 2009/2010, 2012/13, and 2016, in the districts of Badulla, Kandy, Nuwara-Eliya and Ratnapura. These four districts have at least 5% of the population from each of the rural, urban and estate sectors. The total sample size was 13,881 households of which 2010 urban, 8508 rural and 3363 from estate households were selected based on the two-stage stratified sampling method of Neymann allocation. The survey was conducted by the Department of Census and Statistics over a period of 12 consecutive months of weekly consumption of nine rice varieties in the market such as white kekulu normal, white kekulu samba, red kekulu normal, red kekulu samba, samba, nadu red, nadu white, basmathi and several other rice varieties. Weighted average prices were estimated for each rice variety.

A basic food expenditure function includes expenditure on food items as the regressand and income as the only explanatory variable. Here the total household expenditures are used as a proxy for income because income data generally suffer from measurement errors and may also include a transitory component of income (Burney & Khan, 1991). So, the household monthly rice expenditure equation can be written as:

$$ln\,RE = \beta_0 + \beta_1 lnTI + u \qquad (1)$$

Where, RE – Total monthly rice expenditure per household; TI – Total monthly income per household; β_0 and β_1 are the unknown parameters to be estimated and u is a stochastic error term.

Based on King and Byerlee (1978) MPE can be derived from equation (1) and written as:

Marginal Propensity to Expend (MPE) = $\beta_1 = \frac{\Delta \ln(RE)}{\Delta \ln(TI)}$

.

Results and Discussion

Figure 1 below depicts estimated magnitude of the MPE on rice declining in all three sectors when household income increases. Magnitudes of MPE on rice are 6.72×10^{-8}, 6.20×10^{-8} & 2.94×10^{-8} for estate, rural and urban sectors respectively. There is a larger difference in the magnitude of MPE between

estate and urban sector. However magnitudes of MPE are almost similar in rural and estate sectors at each income level. The magnitude of MPE in estate households was higher than in other sectors at all income levels. This indicates that households in the estate sector show highly responsive rice consumption (elastic) to changes in income. Likewise, urban and rural sector households show low and medium responsiveness in rice consumption respectively to changes in income.

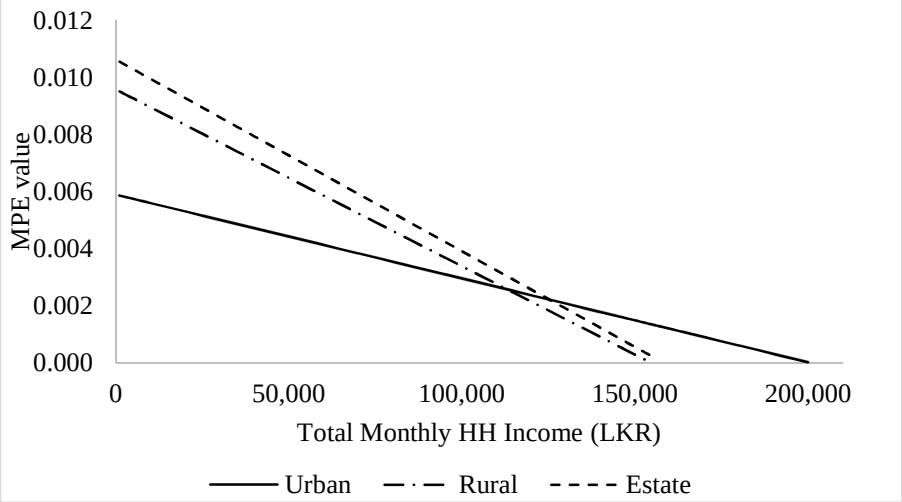

Figure 1: Marginal Propensity to Expend of Rice

The difference between magnitude of MPE on rice between rural and estate sectors is seen to be very small and decreasing as monthly income increases. However, high income estate households show relatively higher MPE value indicating higher responsiveness in rice consumption to income changes.

The difference between urban and estate sectors is greater than the difference between estate and rural sectors. The magnitude of MPE on rice is lower in higher income level households in the urban sector even though there is a trend for this difference to decrease. The declining behavior of the magnitude of MPE on rice is smooth and regular in all sectors. Estate sector having low availability of income sources and hence with low income, a change in income would cause higher responsiveness in rice consumption, which implies much of their income is spent on food items like rice. But, urban households' monthly earnings as well as earning opportunities are very high compared to other sectors, so that responsiveness to rice consumption is low.

Conclusion

The findings show a decreasing MPE with respect to income all three sectors related to different rice varieties. Among the sectors, highest impact on rice consumption is in the estate sector when household income increases. So, compared to other sectors the estate sector is highly responsive to food consumption as their income increases. Urban sector households demonstrate the lowest impact of income on rice consumption.

It is also observed that there was considerable variation in MPE across income levels. The highest, lowest and medium level variations of MPE were found in the estate, urban and rural sectors respectively. The higher MPE variation was found among low income receipent of the estate sector. The lower income sector spends a substantially higher incremental total income on rice consumption than the higher income sector. It means that the incremental total expenditure on food in estate households is higher than in rural and urban sector households. The results of this study suggest that income-oriented policies are important to achieve better food consumption in all sectors to reduce the problem of unbalanced diets. In addition, complementary policies are necessary.

If there are sudden shocks like COVID 19, the occurred the total economy is changed due to instability of the market situation. It means increased consumer demand of food-supply cannot reach due to less productivity. Further research is required in these lines.

References

Burney, N. A. and Khan, A. H. (1991). Household consumption patterns in Pakistan: An urban rural comparison using micro data. *The Pakistan Development Review*. 30, 145-171.

Dunne, P. and Edkins, B. (2005). The demand for food in South Africa, *Economics Society South Africa Conference,* Durban.

Haavelmo, T. (1947). Family expenditures and the Marginal Propensity to Consume, *Econometrica*. 15, 335-341

King, R. P. and Byerlee, D. (1978). Factor intensities and locational linkages of rural consumption patterns in Sierra Leone. *American Journal of Agricultural Economics*, 60(2), 197 – 206.

Langemeier, M. R. and Patrick, G.F. (1990). Farmers' marginal propensity to consume: An application to Illinois Grain Farms. *American Journal of Agricultural Economics*. 72(2), 309–316.