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ORIGINAL ARTICLE

Testing the Engel's law on the consumption pattern of the people of Tangail Sadar Upazila in Bangladesh

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Abstract
Engel's law is one of the most enduring relationships in economics regarding income-food expenditure of the households. According to the law when family income increases the share of food expenditures diminishes despite the actual amount of food expenditure may increases. It was a dimensional research issue during the early stage of the development of the law and it becomes a basic law in behavioral economics. However, in the 21st century many things are included in consumption bundle which were not available in Engel's day viz. automobiles, health insurance, and mobile phones etc. Hence, after more than 150 years after economists and policy makers have a tireless attention on the applicability and relevance of the law in different economic aspects. Thus, the study aims to investigate the relevance of the Law in Tangail Sadar Upazial of Bangladesh. To pursue the study, required data is collected from Tangail Sadar Upazial by following multi-stage sampling technique. After analyzing data, it is revealed that Engel's Law is applicable in the study area. Therefore, the study suggests the respective authorities to take more initiatives for income enhancing programs so that people can spend more on non-food investment.

Keywords: Household-income; Household-expenditure; Engle Law; Food-expenditure; Bangladesh.

1. Introduction

The relationship between household income and share of food expenditure is one of the most enduring relationships in economics which is introduced by Ernst Engel in 1857 in his seminal paper "Die Productions and Consumptionsverhaltnisse des Königreichs Sachsen" (Engel, 1857).

According to the law when household income increases the share of food expenditures in total household income decreases albeit the actual amount of food expenditures increases. Therefore, the population with a low income will spend more money to cover their basic needs viz. food, clothing, housing, etc. but when income increases their spending is directed to purchase goods for their comfort viz. better health, transport, recreation and culture, tourism etc. Hence, the share of food expenditure evolves in an inverse relationship with income and the elasticity coefficient of this type of consumption is higher than 1 suggesting that 1% increase in household income may increases the food expenditure less than 1% (Neagu & Teodoru, 2017). However, investigating the relevance of Engel's law is not just of historical interest, rather in present days the share of food expenditure in household expenditure is often used to measure national poverty lines and hence, helping in determining national poverty

rates (Anker, 2011). Hence, the contribution of Engel remained valid for the nineteenth as well as the twentieth century (Perthel, D. 1975; Zimmerman, 1932).

However, in the 21st century expenditure categories have included many things that weren't available in Engel's day viz. automobiles, health insurance, and mobile phones etc. Hence, after more than 150 year economists and policy makers have a tireless attention on applicability and relevance of Engel law in different aspects of economics (Neagu & Teodoru, 2017). Thus, the study aims to investigate the relevance of the Law in Tangail Sadar Upazial of Bangladesh.

2. Literature review

Several literatures conducted on income-expenditure relationship and related issues. By reviewing data of more than thirty years Campbell and Deaton (1989) revealed a significant relationship between income and food expenditure over time and this relationship is explained more solely by measuring income instead of permanent income. In another research Jappelli and Pistaferri (2010) investigated into the empirical data on the sensitivity of consumption and projected income changes and found almost similar relationship between household income and expenses mainly food expenses. In addition, the study also revealed that changes in household food expenditure depends on the geographical areas, income incentives and economic development of relevant country. It is found that income sensitivity of food expenditure is comparatively more in underdeveloped and developing countries rather than in developed countries. However, Tukker et al. (2010) examinee the environmental impact on home consumption from different perspectives viz. different client groups, economic levels, and geographic locations. Several insights were confirmed and improved by this work including the fact that food and beverages, mobility, housing, and energy-using products are the most significant consumption domains from the perspective of environmental sustainability and that higher household income has greater (but less than proportional) impacts expectations. Another research Gibson and Grant (2001) discussed about a cohort study of household spending, saving, and income in New Zealand. It is based on an examination of unit record data from the Household Economic Survey (HES) for the years 1984 to 1998. It is found that younger and older cohorts appear to be a "V" shaped cohort pattern in household income and saving. Bradbury (2004) also discovered that income distribution within households have a considerable effect on their spending. Whereas, Chao (1992) revealed that the product of two components consumption per household member and the specific size of the household determine household demand for a specific good. It is also found that per capita income of the household and the demographic characteristics of the household have a great influence on per capita household expenditure. Through utilizing microdata to estimate the predictors of family income as well as to assess the impact of human capital and earnings uncertainty on consumption Miles (1997) showed that permanent income and income ambiguity have a significant impact on household spending.

3. Theoretical Background

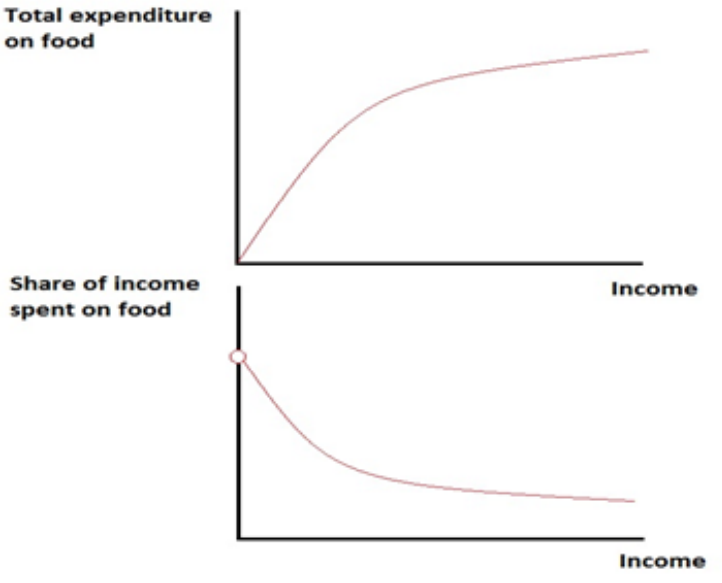
Ernst Engel, a statistician, developed Engel's law in 1857. Although Engel's law was put forward more than 160 years ago, it still has application in measuring the status of poverty. For instance, the proportion of family spending on food that determines the lines and rates for national poverty.

In the mid of 19th century, Ernst Engel published a study based on the expenditures of Belgian families. He divided them into three groups: "on relief," "poor but independent," and "comfortable." He then broke down their expenditures for food, clothing, housing, education, recreation, and other spending categories. Engel found that the poorer the group, the greater the share of their budget that went to food, while a lesser percentage went, for example, to clothing and education.

That finding soon became known as Engel's Law. English translations of Engle's Law vary slightly, but are usually expressed as "The poorer a family, the greater the proportion of its total expenditure that must be devoted to the provision of food."

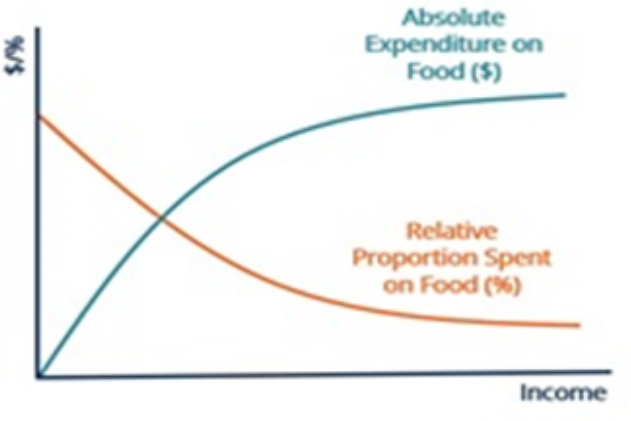
Therefore, remaining other factors same if income of the households increases then total expenditure of food items increases albeit the share of food expenditure decreases.

Figure 1. Engle curve



Source: Google

Figure 2. Engle curve of absolute expenditure and income



Source: Google

Hence, the Engel curve depicts the positive but diminishing income elasticity of food expenditure.

4. Methodology

This section presents an overview of methodology and the procedures applied in this study. It describes the process that is used to collect and analyze data in order to examine and show the relationship

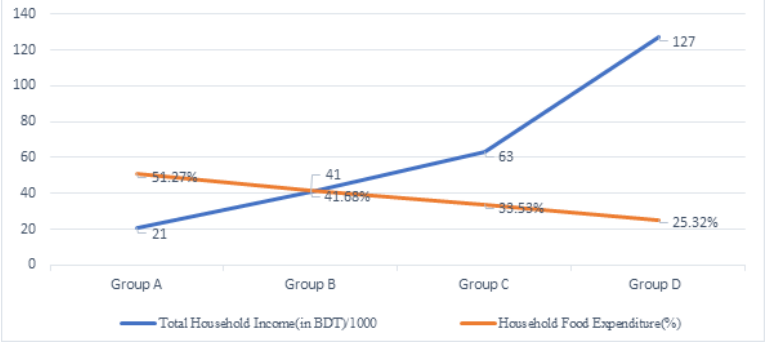
between income and household food expenditure. The study is basically depending of primary data. However, to collect required data the study used multistage technique. At first stage the study selects Tangail Sadar upazila purposively as the study area. Then the study used simple random sampling selecting the respondents. Finally, through face to face conduct with a semi structured questionnaire required data is collected from 110 responding households. However, to analyze the data, total 110 households have been divided into four groups viz. Group A: households that earn less than Tk. 30000, Group B: households that earn more than Tk. 30000 but less than or equal to Tk. 50000. Group C: households that earn more than Tk. 50000 but less than or equal to Tk. 75000, Group D: households that earn more than Tk. 75000. Then the differences between these four groups have been compared with each other.

5. Discussion of Results

For this research household level data from 110 responding households in the study area has been collected. Among these households 28 are in group A whose average monthly income is Tk. 21,143 and average monthly food expenditure is Tk. 11,031. Therefore, share of total household income used as household food expenditure is 51.27%. Another 33 households are in group B. In this group average monthly income is TK. 40788 and average monthly food expenditure is TK 16,863.23. Therefore, share of total household income used as household food expenditure is 41.68%. Another 33 households are in group C where average monthly income is TK. 63127.27 and average monthly food expenditure is TK. 21,126.86. Therefore, share of the total household income used as household food expenditure is 33.53%. Last 16 households are in group D whose, average household income is TK. 127403.06 average monthly food expenditure TK. 30,141.78 and hence share of the total household income used as household food expenditure is 25.32%. For ease understanding the results of different groups and sections, here is a bar diagram to illustrate the in contents of the table graphically.

It is observed in Figure 3 that as average monthly household income increases from Group A to D, the share of household food expenditure declines. The average monthly income in Group A is Tk. 21,143.45 and in Group B it is Tk. 40788.79 where in Group C and Group D it is Tk. 63127.27 and Tk. 127403.06, respectively. This clears out that the groups show an increase in average monthly income of the households.

Figure 3. Relationship Between Income and Food Expenditure



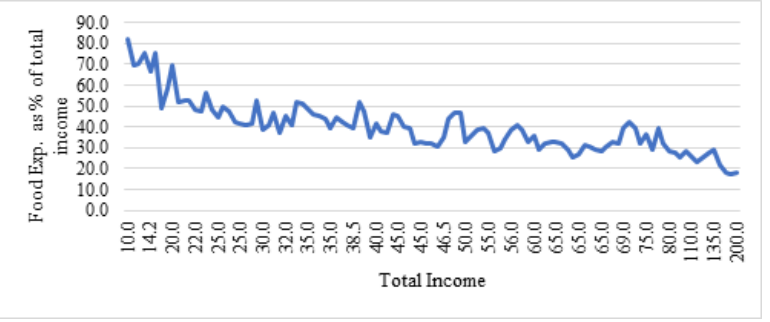
Source: Field survey, 2023

On the other hand, share of food expenditure in Group A is 51.2%, in Group B 41.68%, in Group C 33.53% and Group D 25.32%. So, there is a clear decline in the share from Group A to Group D.

Figure 4 is a graphical representation of the relationship between these income and food expenditure.

From the figure it is observed that in case of all respondents when income increases then share of the income consumed as household food expenditure decreases. Here the minimum average household

Figure 4. Engle curve- Relationship between income and food expenditure.



Source: Field survey, 2023

income is Tk. 10,000 where the amount used as household food expenditure is Tk. 8,225, which is 82.25% of the total monthly household income. On the other hand, maximum household income is Tk. 2,08,300 and the amount used as household food expenditure is Tk.37,985, which is 18.25% of the total monthly household income.

6. Conclusion

This research is focused on the relationship between household food expenditure and household income which is known as Engle Law. The law states that as a family's income grows, so does the percentage of income spend on food diminishes, despite the fact that the actual amount grows. From the results in Fig 4.6 shows that the average monthly income in various groups is Tk. 11031, Tk. 16863, Tk. 21126, and Tk. 30,141 while the share of the average household income used as household food expenditure is 51.27%, 41.68%, 33.53% and 25.32%, respectively. So, as the income grows from one group to another the percentage of the income used as food expenditure decreases. Therefore, it can be concluded that the study area follows the law of Ernst Engle, "As the income level rises people tend to use less of their income on food expenditure." Thus, the study suggests the respective authorities to take more initiatives for income enhancing programs so that people can spend more on non-food investment.

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