

E1-28: A Study of demand for electricity in Sri Lanka using multivariate regression approach

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The demand for electricity in Sri Lanka depends mainly on the activities of domestic, industrial and commercial sectors and is highly correlated. Although such correlation does not affect univariate estimation procedures, incorrect inferences of influential factors on the demand for electricity may be drawn. As a result, separate univariate approaches for each sector may not be an accurate method of identifying such factors. Therefore, this study aims to identify such factors using the multivariate regression which considers the correlation among different sectors (or dependent variables) and estimates a multivariate demand model for the purpose of forecasting.

The overall significance of the fitted demand model and the significant influential factors are assessed by multivariate tests such as Bartlett's using the statistical package SAS. Theoretically, demand is a function of its own price, the income level of consumers, and the prices of substitutes. Gross Domestic Product at constant (1980) factor prices is used as a proxy for income level of consumers and kerosene is taken as a close substitute for electricity. The analysis uses quarterly data for 2 periods 1970-1977 and 1978-1995 to assess the effect of the liberalized economy introduced in late 1977.

During the period after 1977, the effect of the income level has increased substantially due to the liberalized economy. The substitution between electricity and kerosene is quite marginal in the post-liberalized period, as the use of electricity is more efficient and convenient than that of kerosene. Due to such differences between the 2 periods, the demand for electricity may be explained better by 2 models rather than a single model estimated for the entire period. The multivariate demand model based on post-liberalized period is found to adequately forecast the demand for electricity.