

## **Allen or Morishima Elasticities: Some Empirical Evidence from Indian Manufacturing Sector**

**Joyashree Roy**

Degree of substitutability between inputs is measured by the elasticity of substitution, one of the most fundamental measures in the theory of production. For multi-input production technology AES estimates has dominated the Applied Production Theory for quite a long and very crucial period of time. However, in the early eighties AES had been questioned on theoretical grounds and in lieu MES was suggested as an appropriate measure. In this paper empirical evidence has been provided to compare these two measures based on the parameter estimates of the translog cost function applied to study the 'interfuel substitution' possibilities using the time series data for disaggregated Indian manufacturing sector. Noticeable differences have been found between the two estimates. While technical relationship between coal-oil and oil-electricity cannot be generalised through AES estimates as both complementarity and substitutability has been observed across the industries; the MES estimates have provided us with the general nature of the technical relationship between the fuel pairs as substitutes. This has a special policy implication where industry specific fuel pricing policy may not be feasible. Moreover, we find that asymmetry of the MES values have quite significant implication in choice for policy variable. As asymmetry results of AES reveals indifference between the choice of the fuel price (e.g., coal, oil, electricity) variable to induce changes in the relative price to bring into the change in the relative fuel mix, MES on the contrary does provide preference pattern for fuel price variable. Another possible interpretation of asymmetric MES through 'irreversibility' could not be generalised for any particular fuel in terms of inherent preference for a better fuel.

### **Introduction**

Specificity of the situations and objectives have given rise to quite a large variety of empirical analysis of production technology. Literature on Applied Production Theory in the decade of seventies and beyond is dense with the studies on producers' behaviour in the face of rising energy (oil) prices. Production models are used chiefly for analytical studies of the production process emphasising a specific aspect of technology - 'substitution' - the degree of substitutability of factors of production - a) capital, labour, energy, materials and/or b) oil, coal, electricity, natural gas especially, for the industrial