Economics and Business Letters
3(1), 1-2, 2014

Introduction to the Special Issue: Modelling Issues in Applied Efficiency Analysis

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Received: 4 June 2014
Accepted: 4 June 2014

Most microeconomics textbooks do not make an explicit reference to productive inefficiency. The common assumption of profit maximization precludes inefficiency since firms know the technology as well as input and output prices, leaving no room for either systematic or unsystematic mistakes.

However, real life continuously shows that inefficient behaviour exists. We observe farmers planting too late, inputs being under or over used (given technology and prices), and so on. However, identification of inefficient behaviour is not simple. For example, the researcher does not always know all the restrictions faced by the firms. Thus, a farmer may sow too late because he was sick, or for many other reasons that we would not want to label as inefficiency.

The literature on efficiency analysis has grown enormously since the seminal papers of Aigner, Lovell and Schmidt (1977) and Charnes, Cooper and Rhodes (1978) in the parametric and non-parametric approaches, respectively, though much still needs to be done. This Special Issue is an attempt to contribute to the literature by highlighting some challenges faced when carrying out applied studies. Rather than trying to provide an updated set of surveys on several areas where efficiency analysis is applied, the focus of this Special Issue is on the analysis of modelling issues that practitioners face when doing applied work.

In the first paper, Alvarez and Arias review a broad set of concepts, models and estimation issues in the field of stochastic frontier analysis. The conceptual issues addressed include the interpretation of inefficiency as well as the gap between efficiency measurement and efficiency reduction. The modelling and estimation parts deal with topics such as the explanation of inefficiency, time-varying inefficiency and controlling for unobserved firm heterogeneity.

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Citation: Álvarez, A. (2014) Introduction to the Special Issue: Modelling Issues in Applied Efficiency Analysis, *Economics and Business Letters*, 3(1), 1-2.

ISSN: 2254-4380

Karagiannis provides a critical overview of the main modelling issues surrounding technical efficiency measurement in agriculture. The issues covered include the choice of orientation of the index, the method of estimation, the modelling of "environmental factors" when measuring and explaining efficiency, and the special treatment required for particular inputs such as extension services and pesticides.

Grosskopf, Hayes and Taylor review the many challenges of measuring efficiency in the educational sector including, among others, poor measurement of inputs and outputs, endogeneity issues and the role of nondiscretionary inputs such as students' characteristics. They make a strong case for the value of this thread of research for policymakers who are interested in using efficiency scores to reward (punish) schools and even teachers.

Ferrier takes up the challenge of analysing the current relevance of stochastic frontier applications in the health care sector and offers suggestions on how to enhance their usefulness. He explicitly draws attention to the lack of actionable results, arguing that this may be partly due to the fact that SFA is often applied at the organizational level rather than at the "production line" level, thereby precluding specific policy measures and actions.

Filippini and Orea discuss some of the issues that energy researchers and regulators have to address in two of the areas where stochastic frontier analysis is applied in the energy sector, namely the estimation of productive efficiency of electricity and gas distribution networks, and the estimation of energy demand frontier models.

Lansink and Wall provide an overview of frontier models used to evaluate environmental efficiency, with a focus on applications in the agricultural sector. They place particular emphasis on eco-efficiency models, the materials and exergy balance approach. They finish with a review of the principal contributions analyzing the determinants of environmental efficiency and offer some suggestions for future research.

Finally, Bravo-Ureta presents a novel application of efficiency analysis that integrates stochastic production frontiers with impact evaluation of development projects. This approach allows for the technology effect of a project to be separated from the different managerial performance of the treated versus the control group. His article provides an overview of how impact evaluation and stochastic frontiers are being brought together to shed light on the productivity effects of intervention policies in agricultural development.

References

Aigner, D.J., Lovell, C.A.K. and Schmidt, P. (1977) Formulation and estimation of stochastic frontier production function models, *Journal of Econometrics*, 6, 21-37.

Charnes, A., Cooper, W.W. and Rhodes, E. (1978) Measuring the efficiency of decision making units, *European Journal of Operational Research*, 2(6), 429-444.