

DEA: A RESPONSE

Harvey Goldstein

Institute of Education, University of London

There are a number of things upon which Professor Desai and I can agree, for example that the term *efficiency* should be dropped. The use of this term has led to considerable misunderstandings and he is right to point out that attention should be focused on how to interpret DEA results.

Professor Desai, however, appears to have misunderstood my discussion of the relationship between output and input variables and he does not respond properly to my critique. We are both agreed that good data analytic practice attempts to explore many possible and plausible, relationships in a data set before settling upon any particular one. Unfortunately DEA simply is not designed to do this. My major point is simple and is concerned with model mis-specification, namely that the use of a particular ratio in a DEA analysis can lead to clearly absurd results when the actual relationship between output and inputs is not reflected in the ratio used. My example showed that in a very simple case 'efficiency' was simply a linear function of the inverse of the input score.

The difficulty with DEA is that it cannot by itself establish the nature of the true relationship between the output and input variables. Furthermore, even where a good estimate of this relationship is available and incorporated into the DEA function, there remains the problem of the use of aggregate level data, as I elaborate below.

Professor Desai claims that DEA may be interpreted as an *attention focusing* device. The difficulty is that it may not be focusing attention where it is required. He also claims that:

'Although theory does not dictate a particular level of aggregation before DEA can be used, practical considerations about the interpretation of the results might suggest analyses of aggregate data'.

He goes on to justify the use of aggregate data on the grounds that most policy decisions are made at the class or school level and:

'to arrive at policy recommendations it would be necessary to study the data at a level of aggregation where the unit of analysis is not the individual pupil but a group of pupils in a class or a school'.

The latter part of this statement does not, however, follow logically from the former. The point is that policy decisions should be concerned with the effect of school factors on individual students in all their variety, and not upon the average achievement of a school or class. It is well known that the relationship between output and input variables can be quite different when using individuals as units as opposed to schools or classes (Nuttall *et al.*, 1989).

The difficulty with using aggregate level data to study school effectiveness is now well documented, for example by Woodhouse & Goldstein, 1988. That paper shows that slight modifications to an aggregate level analysis, for example, by transforming some of the measurement scales, can have an imperceptible effect on the 'fit' of the model but a very large effect on any ranking of aggregate level units. This problem will be present in all analyses which use aggregate level data.

Finally, like Professor Desai I welcome this debate. Unlike him I remain unconvinced that DEA has anything useful to offer towards our understanding of the differences between schools and their relative effectiveness.

References

- Nuttall, D. L., Goldstein, H., Prosser, R. and Rasbash, J. (1989) Differential school effectiveness. *International Journal of Educational Research* 130, 769-76.
- Woodhouse, G. and Goldstein, H. (1988) Educational performance indicators and LEA league tables. *Oxford Review of Education* 14, 301-19.

ESL: A Handbook for Teachers and Administrators in International Schools

Edited by Edna Murphy

"... this Handbook on ESL is certain to become a major reference work of concern to all involved with children who are being educated in a language other than their mother tongue. This book particularly addresses the issues inherent in accepting non-English-speaking students into English-medium international schools. It covers theory and practice in all curricula aspects, from philosophy, goals and objectives through to organization of instructional groups of LEP (low English proficient) children."

International School Journal, Autumn 1990

NEW IN PAPERBACK

Hbk ISBN 1-85359-090-8 £25.00 (US\$55.00)

182 pages

Pbk ISBN 1-85359-157-2 £ 9.95 (US\$20.00)

1991

MULTILINGUAL MATTERS LTD

Bank House, 8a Hill Road,

Clevedon, Avon, England, BS21 7HH

