MARIT. POL. MGMT., 1995, VOL. 22, NO. 4, 389–390

Comment

Factor analysis and benchmarking ports' performance

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1. Analysis of port performance

'Port comparison can only be valid and meaningful if a port's efficiency is compared with a similar port' states Jose Tongzon in his recent paper in *Maritime Policy & Management* on 'Systematizing international benchmarking for ports' (Vol.22, No.2, abstract). Since world ports are not similar, Tongzon advocates the use of Factor Analysis (FA) for port groupings and development of performance indices. An illustration, comparing 23 ports worldwide was included.

FA, using the Principal Component technique, is a complex data analysis method aimed at two objectives:

(*a*) unravelling a dimensional structure in the data; and
(*b*) concentrating the data and presenting it in a parsimonious fashion.

FA is descriptive with no direct inferential orientation. FA's factors are set on a pure statistical ground; they are not separated into dependents and independents and no hypothesis is set forth to explain or predict the first by the second, as is the case, for example, with multiple regression (the statistical procedure is intentionally set to produce uncorrelated factors, and the Principal Components are the orthogonal eigenvectors of the covariance matrix). Also, FA factors have no normative implication; higher factor scores are not necessarily considered as more desirable.

Benchmarking or any analysis of port's operational performance is both inferential and normative, however. Presumably, a competent port management is capable of doing more with less, but without sacrificing the level of service. Management is expected to employ its marketing, planning and administrative skills to efficiently utilize the resources under its control. Accordingly, performance is commonly assessed in an input/output context. The analysis starts with setting a clear, normative definition of operational performance. Then, it attempts to relate performance, considered as dependent variables, to a range of independent variables: some are defined as uncontrollable (e.g. trade, vessels, facilities) and others as controllable (e.g. managerial competence). The intention is to isolate the latter from the former, or to measure the net effect of port management. In Tongzon's example, the dependent variables may include Vessel-Calls or TEUs; the independents may include trade setting ('role') and major terminal components such as berths and cranes. A better way of analyzing performance would be to use output/input ratios as dependent variables (e.g. Calls/Berth, TEUs/Crane).

0308–8839/95 $10·00