

Data Envelopment Analysis for Marginal Profit Maximization

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[Lee, Chia-Yen, 2014. Meta-Data Envelopment Analysis: Finding a Direction Towards Marginal Profit Maximization. European Journal of Operational Research, 237 \(1\), 207-216.](#)

【106 Ta-You Wu Memorial Award】 Special Issue

This study describes the production behavior. In data envelopment analysis (DEA), the input-oriented efficiency measure and output-oriented efficiency are two typical ways for technical efficiency estimation. However, it is difficult to reduce input with maintaining the same output level or increase output level without increasing input. The two orientations are argued in practice. This study suggests that the firm should move toward the marginal-profit-maximized benchmark.



This study uses mathematical programming technique to estimate the production frontier, and build the meta-DEA frontier (i.e. frontier about frontier) by the directional marginal productivity. Given the price information of inputs and outputs, the marginal-profit-maximized benchmark can be identified. That is, the allocatively-efficient target on the meta-frontier, as following Figure 1. Typical DEA frontier is based on the “level” while the meta-DEA frontier is based on the “margin”. Thus, we can estimate the technical efficiency via the marginal-profit-maximized orientation, and give a comparison to the input-oriented measure and output-oriented measure for clarifying the managerial insight.

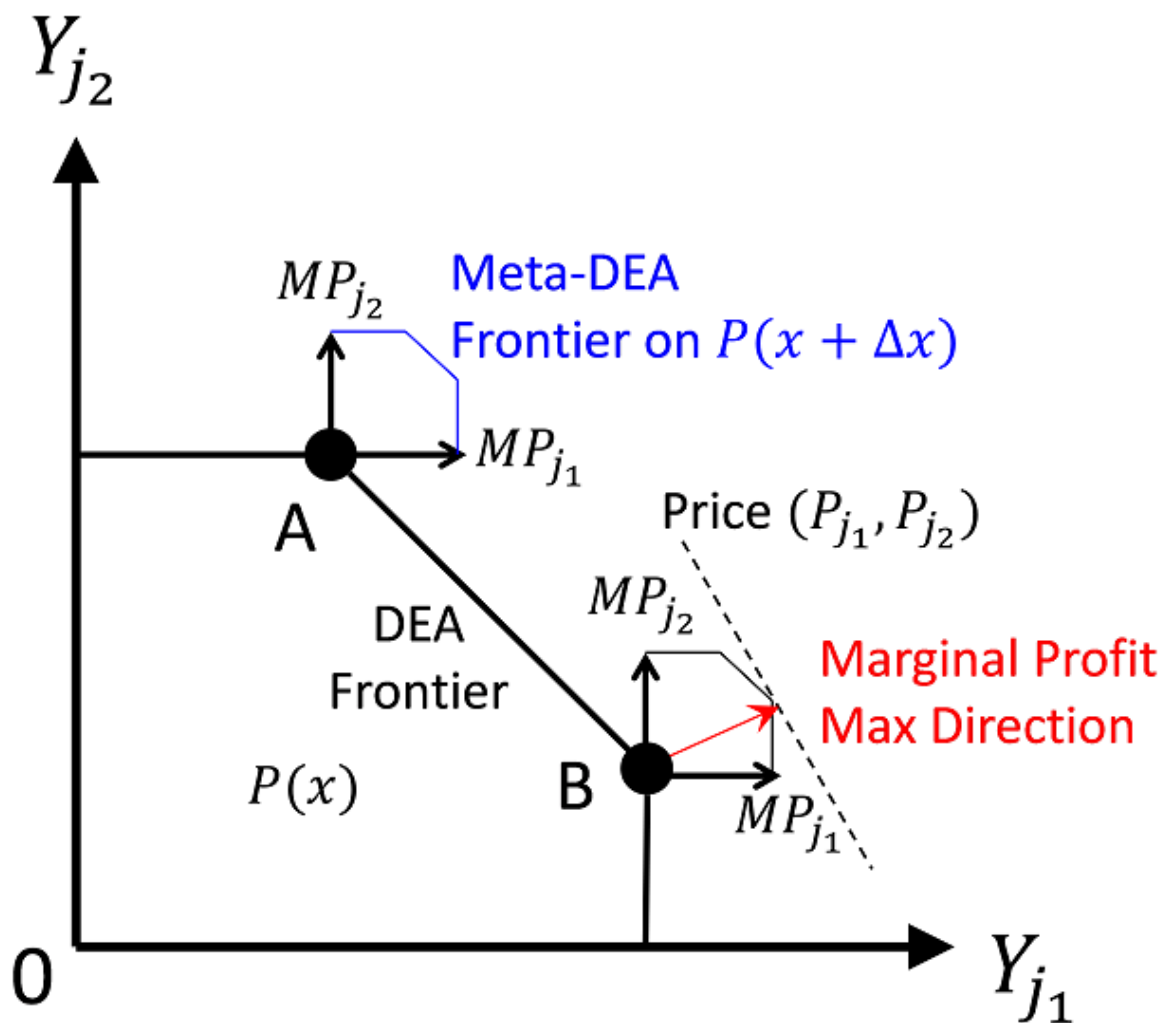


Figure 1 Efficiency estimation by marginal-profit-maximized benchmark

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