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# Measuring productivity change in higher education: an application of Hicks-Moorsteen total factor productivity index to Malaysian public universities

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## Disclosure statement

No potential conflict of interest was reported by the authors.

## Notes

1. Gilbert and Wilson (1998), Glass and McKillop (2000), and Arjomandi, Valadkhani, and Harvie (2011) experienced this difficulty in their studies of the Korean banks, UK building societies, and Iranian banks, respectively.

2. Briec and Kerstens (2004) also proposed an interesting difference-based variation of the Malmquist index known as the Luenberger–Hicks–Moorsteen indicator in the

literature. For more details, see Briec and Kerstens (2004) and Van de Ven and Kerstens (2007).

3. Research on the efficiency of universities in Malaysia is limited. According to the Ministry of Education (2010), the following are the main reasons for the low efficiency of universities in Malaysia:

(1) The quality of university education is low. These universities do not offer comprehensive courses; (2)

universities do not have a wide range of courses; (3) the quality of courses is low. The quality of courses is low because of the lack of qualified academics. Focused universities focus on certain fields of knowledge related to the



original objective of their establishment. They have the same characteristics as research universities.

4. All research is on the focused and established institutions: Universiti Malaya, Universiti Sains Malaysia, Universiti Kebangsaan Malaysia, Universiti Putra Malaysia, and Universiti Teknologi Malaysia.

5. Also called multi-disciplinary universities, which focus on a wide cross-section of courses and fields of study: Universiti Islam Antarabangsa Malaysia, Universiti Malaysia Sarawak, Universiti Malaysia Sabah, and Universiti Teknologi MARA.

6. They concentrate on specified disciplines linked to the original objective of their establishment: Universiti Utara Malaysia, Universiti Pendidikan Sultan Idris, Universiti Malaysia Terengganu, Universiti Sains Islam Malaysia, Universiti Tun Hussein Onn, Universiti Teknikal Melaka Malaysia, Universiti Malaysia Pahang, and Universiti Malaysia Perlis.

7. Peer-review approach is an evaluation process of research output carried out by qualified individuals within the relevant areas. This approach was adopted by Johnes (1995) and Meng et al. (2008).

8. This is entirely consistent with the theory behind technical changes explained by O'Donnell (2012a).

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