



511 | 17 | 0  
Views | CrossRef citations to date | Altmetric

Articles

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

Amir Arjomandi , Mad Ithnin Salleh & Abbas Mohammadzadeh

Pages 630-643 | Received 22 Mar 2014, Accepted 12 Feb 2015, Published online: 19 May 2015

Cite this article <https://doi.org/10.1080/13547860.2015.1045323>



Sample our  
Economics, Finance,  
Business & Industry Journals  
>> **Sign in here** to start your access  
to the latest two volumes for 14 days

Full Article

Figures & data

References

Citations

Metrics

Reprints & Permissions

Read this article

Share

## Abstract

This paper offers an in-depth analysis of efficiency and productivity changes using the Hicks-Moorsteen total factor productivity index, in the context of higher education institutions. Unlike the Malmquist method, this approach makes no assumptions about firms' returns to scale conditions. We assume that the production technology exhibits variable returns to scale, which is more plausible than the constant returns to scale assumption, because universities usually operate at suboptimal scales. Three major groupings of Malaysian public universities are used in our case study: research, comprehensive, and focused universities. The results show that technical efficiency has improved after the 2007 National Higher Education Strategic Plan within all the three university groupings.

Keywords:

total factor productivity

higher education institutions

efficiency

Malaysia

JEL classification codes::

C14

D24

H52

I21

---

## Acknowledgements

We wish to thank the anonymous referee, whose invaluable inputs and comments considerably improved an earlier version of this article. The usual caveat applies.

---

## 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 recent theoretical contributions on the Hicks–Moorsteen index, also see Briec and Kerstens ([2011](#)), Briec, Kerstens, and Peypoch ([2012](#)), and Kerstens and Van de Woestyne ([2014](#)).
3. Research universities are well-established, research-intensive institutions. According to Malaysian Ministry of Higher Education ([2007](#)), this category is awarded to universities that place emphasis on aspects of research and development. These universities share the following features: (1) research-oriented subject areas; (2) competitive entry requirement; and (3) highly qualified academics. Comprehensive

universities (also called multi-disciplinary universities) focus on a wide range of courses and fields of specialization. The three characteristics among these universities are: (1) wide range of subject areas; (2) competitive entry requirement; and (3) highly 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](#)).

---

## Additional information

### Notes on contributors

## Amir Arjomandi

Dr Amir Arjomandi is a lecturer at the School of Accounting, Economics and Finance, University of Wollongong. Amir's research interests are in efficiency and productivity, environmental economics, applied microeconomics. His works are published in several journals including Economic Modelling, Journal of the Asia Pacific Economy, Applied Economics Letters, Studies in Economics and Finance, and Research in International Business and Finance.

## Mad Ithnin Salleh

Dr Mad Ithnin Salleh obtained his doctoral degree from the University of Wollongong, Australia, specialising in efficiency and productivity. His area of interest includes performance measurement, efficiency and productivity, and developing a quantitative method for management and quality management system. He is currently a senior lecturer at the Faculty of Business and Economics, Sultan Idris Education University, Malaysia.

## Abbas Mohammadzadeh

Mr Abbas Mohammadzadeh is a PhD candidate in economics and also a casual teaching academic at the School of Accounting, Economics and Finance, University of Wollongong. His main research interests include macroeconomics, natural resource and energy economics, applied econometrics, international trade and finance, and efficiency and productivity.

---

### Related Research Data

[Efficiency, technology and productivity change in Australian universities, 1998–2003](#)

Source: Economics of Education Review

[Measuring the Research Performance of Chinese Higher Education Institutions: An Application of Data Envelopment Analysis](#)

Source: Education Economics

Influence of regulation on the productivity of waste utilities. What can we learn with the Portuguese experience?

Source: Waste Management

A Post Deregulation Analysis of the Sources of Productivity Growth in UK Building Societies

Source: Manchester School

Comparing alternatives to the Web of Science for coverage of the social sciences' literature

Source: Journal of Informetrics

Research in the field of waste management and productivity growth in the UK building societies

## Related research

People also read

Recommended articles

Cited by  
17

## Information for

[Authors](#)

[R&D professionals](#)

[Editors](#)

[Librarians](#)

[Societies](#)

## Opportunities

[Reprints and e-prints](#)

[Advertising solutions](#)

[Accelerated publication](#)

[Corporate access solutions](#)

## Open access

[Overview](#)

[Open journals](#)

[Open Select](#)

[Dove Medical Press](#)

[F1000Research](#)

## Help and information

[Help and contact](#)

[Newsroom](#)

[All journals](#)

[Books](#)

## Keep up to date

Register to receive personalised research and resources by email



Sign me up



Copyright © 2025 Informa UK Limited [Privacy policy](#) [Cookies](#) [Terms & conditions](#)

[Accessibility](#)

 Taylor and Francis Group

Registered in England & Wales No. 01072954  
5 Howick Place | London | SW1P 1WG