



Efficiency and productivity growth in Chinese universities during the post-reform period[☆]

Ying Chu NG^{*}, Sung-ko LI

Department of Economics, Hong Kong Baptist University, Kowloon Tong, Kowloon, Hong Kong, China

ARTICLE INFO

Article history:

Received 10 December 2008

Received in revised form 27 February 2009

Accepted 3 March 2009

JEL classification:

I20

L30

Keywords:

Technical efficiency

Congestion

Malmquist productivity index

Research

Chinese universities

ABSTRACT

The social science research performance of Chinese universities is examined using panel data. The universities are found to be very inefficient in general, with not much difference between regions. By far the largest single cause of universities' overall technical efficiency is pure technical efficiency, along with a considerable amount of scale inefficiency and a modest amount of congestion. No obvious regional differences in the universities' productivity growth are apparent between 1998 and 2002. Decomposition of the Malmquist productivity index indicates that although there has been technological progress over the years, poor scale efficiency and technical efficiency have resulted in deterioration in the universities' average productivity. There are signs of increasing congestion during the period studied.

© 2009 Elsevier Inc. All rights reserved.

1. Introduction

The remarkable economic growth in China since the 1980s has highlighted the importance of human capital investment. It is well documented that investment in human capital is one of the key factors sustaining the growth of any economy. Changes in the education sector have long-term impacts on an economy, but particularly on an economy like China's undergoing economic transition.

Previous assessments of the education sector at the school district level or at the higher education level in developed countries have presented a mixed picture, but there has been only a smattering of research work in this area from the developing world. Assessing the education sector in China during its education reforms thus provides a real-world case for understanding the education sector's responses to the changing environment during economic transition.

Interpreting the effects of the recent education reforms in China is complicated by the economic reforms (enterprise and industrial reforms) in progress at the same time. It is well documented that the economic reforms of the past two decades have resulted in growth imbalances among China's regions. The coastal region has consistently been the fastest growing region, with annual growth averaging 10%, compared with the non-coastal (central and west) region with annual growth of 7.4%–8.4% during the course of reform (Bao, Chang, Sachs, and Woo, 2002). This coastal-led development effect has been especially strong since 1990 (Jian, Sachs, and Warner, 1996). Not until the late 1990s did the growth disparities narrow as the government directed more support towards the inland provinces.

[☆] The authors are indebted to the referee in providing valuable comments and suggestions for revising the paper. The authors also acknowledge with gratitude the generous support of the Research Committee of Hong Kong Baptist University for the project (FRG/04-05/1-21) without which the timely production of the current publication would not have been feasible.

^{*} Corresponding author. Tel.: +852 3411 7555; fax: +852 3411 5580.

E-mail address: ycng@hkbu.edu.hk (Y.C. Ng).

The regional disparities have had implications for the self-funding of higher education institutions granted by the education reforms. The shrinking of the central education fund over time has meant that Chinese higher education institutions have had to rely on fund-raising for both current expenses and development. Although institutions in the coastal region should be in a better position to raise funds, only if they can manage their resources effectively would they outperform institutions in the other region. Accordingly, an analysis of the productive efficiency of Chinese institutions of higher education by region is warranted.

Before the education reforms, the management and the operation of higher education institutions in China was strictly regulated through communist-style central planning. Since the mid-1980s, the reforms have granted management autonomy and freedom in raising funds for the institutions. These changes in practice raise the issue of underused or overused resources. One particular concern is the *congestion* of some inputs in the sense that an increased use of these inputs is found to cause a fall in one or more outputs. Together with standard efficiency measures, this study examines the extent of congestion in Chinese higher education institutions by region.

An assessment at a given point in time only reveals part of the picture for economies in transition. Taking advantage of the availability of five-year panel data, this study seeks to document productivity growth or regression at higher education institutions in China during the post-reform period. Malmquist productivity indices are calculated to provide a more thorough understanding of the performance of the higher education institutions. The sources of productivity change are analyzed by decomposing the Malmquist indices into changes in efficiency and technological change. Such information should be of great value to both policy makers and researchers involved with the education reforms implemented since the mid-1980s.

The rest of the paper is organized as follows. [Section 2](#) highlights the situation of the higher education sector in China since the reform, followed by the methodology section. Findings of the analyses are presented in [Section 4](#). [Section 5](#) concludes.

2. The Chinese higher education sector during the reform period

A series of education documents was published in the early 1990s, which granted more autonomy to China's universities (Cai, 1997). A fixed amount of money was granted by the central government, and each institution was allowed to carry forward any surplus. At the same time, the government's expenditure on higher education as a percentage of total government education spending had been declining since the mid-1980s, from 27.1% in 1985 to 19% in 1994 (The World Bank, 1997). Since the educational reform, the Communist Party of China has begun to encourage universities to search for additional funding (Mok, 2000). The key non-government sources of funds have been from self-raised funds and from tuition fees. According to Lang (2002), self-raised funds came to 21.6 million yuan by 1992, as compared with 0.6 million yuan in 1978. The fall in the proportion of government funds mirrored the changes. Government funds fell from 95.9% of higher education revenue in 1978 to 81.8% in 1992 (The World Bank, 1997). In 1994, this figure was down to 77.2% (Cai, 1997). By the early 2000s, the share was less than 65% (Heckman, 2005; Table 3). For the nation as a whole, the public budget for higher education amounted to 70.1% of tertiary institutions' current expenditure in 1995 (Qi and Chen, 2000).

In addition to the shrinking of central funds, total education funds allocated by the government were greatly differentiated among universities across the regions (Cai, 1997). In 1992, Beijing and Shanghai spent 2.9% and 2.4% of their city GDPs on higher education (The World Bank, 1997). Sichuan and Anhui, on the other hand, spent 1.6% and 1.8%, respectively. Bray and Borevskaya (2001) have pointed out that earmarked educational subventions slowly shifted from the coastal region to the non-coastal region in the 1980s and 1990s. By the late 1990s, the inland had the most emphasis. In 2001, provinces in the east spent about 59–70% of their GDP on education. These shares in the provinces of the central region and the west region were 56–78% and 62–93%, respectively (Heckman, 2005). Gong (1988) has commented that the disparity in regional development resulting from economic reforms made self-raised funds relatively more important to the non-coastal universities during the early phase of education reform. By the late 1990s, the situation may have been reversed.

The Higher Education Law of 1998 made the provincial government responsible for adopting a preferential policy with regard to the import of books and materials, equipment for teaching and scientific research, and with regard to industries run by institutions of higher learning. Returns from industries run by such institutions or from the transfer of intellectual property rights or other scientific and technological achievements were to be used for running the institution. Institutions of higher learning were free to use and control educational funds, and to improve the performance of educational investments.

In 1985, new research initiation was called for in institutions of higher education in China (Hayhoe, 1989, 1991). In 1986, the Chinese government established a national natural science research fund and a high-tech fund (called the 863 fund) for funding basic and technological research. The allocation of these funds entirely depends on the academic quality of the proposals submitted by the universities. A national social science research fund was founded in 1987 (Hayhoe 1993, 1999). Hayhoe and Zhong (1995) have documented that in 1986–1990 only about 860 social science papers and 300 arts and humanities papers from China were published in major international journals. In 1994, the majority of humanities and social science personnel devoted 10% of their work time to R&D (The World Bank, 1997). Nevertheless, as pointed out by that World Bank report, output per researcher was low by international standards, and the quality of research also varied considerably across institutions. This may be attributable to the research spending differential across institutions.

3. Measures of productive efficiency and productivity growth

3.1. Efficiency measures and a measure of congestion

An efficiency measure is an index that measures how close an observation is to an efficiency frontier. Thus, to measure productive efficiency, an efficient frontier must be constructed. A production unit is efficient if and only if it is operating on this frontier. The technology behind this frontier is called a reference technology.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات