Research in Transportation Economics xxx (2016) 1–8

Contents lists available at ScienceDirect

Research in Transportation Economics

journal homepage: www.elsevier.com/locate/retrec

Total factor productivity analysis of Malaysia Airlines: Lessons from the past and directions for the future

Kok Fong See [a, *], Azwan Abdul Rashid [b]

[a] Economics Programme, School of Distance Education, Universiti Sains Malaysia, Malaysia
[b] Department of Accounting, College of Business Management & Accounting, Universiti Tenaga Nasional, Malaysia

ARTICLE INFO

Article history:
Available online xxx

JEL classification:
C43
D24
L25
L93

Keywords:
Productivity growth
Malaysia Airlines
Törnqvist index

ABSTRACT

The main objective of the study is to measure the total factor productivity (TFP) growth of Malaysia Airlines (MAS) over a 34-year period from 1980 to 2013 using a Törnqvist index method. Labour, capital, fuel and other inputs are selected as input measures, whereas the number of passengers, cargo and mail carried and non-traffic revenue are chosen as output measures in the measurement of MAS's productivity. The study revealed that MAS obtained a slow growth in TFP over the study period. The results showed that the privatisation of MAS was not sufficient to produce improved TFP performance. Furthermore, the study also found that the average stage length and load factor are interrelated with the TFP levels in a positive direction. Overall, this study extends the discussion of efficiency and productivity in the airline industry in Malaysia.

1. Introduction

The airline industry is a global industry that is important and increasingly competitive. Factors, such as competition from capitally intensive and technology-driven rivals, volatile fuel price, and infrastructural investments, have resulted in an increasing need to respond quickly to survive in the industry. The rapid growth of airline industry has posed an increasing threat to the long-term sustainability of airlines, putting their futures at risk (Hepher, 2012). As the input prices are beyond the control of the airlines, the only way to lead in this industry is to improve airline efficiency (Bjelicic, 2012). Therefore, estimating and measuring productivity has attracted considerable attention in recent years.

Motivated to improve efficiency and productivity in the economic development, the Malaysian government announced its privatisation policy as a national policy in 1983. Under the government's privatisation plan, Malaysia Airlines (MAS)[1] became the first governmental agency to go private in 1985. As the national flagship air carrier, MAS must strike a balance between its commercial, political and social obligations and will always be under close public scrutiny. The continuing evolution of a highly competitive airline industry has raised dominant issues, such as cost efficiency, operating profitability and competitive behaviour, which has led MAS to financial crises.

In 2013, MAS reported a loss of MYR1.17 billion. MAS has not been short of restructuring efforts in the last decade. Indeed, many initiatives (e.g., BTP 1[2] and BTP 2[3]) were implemented to drive revenue; other efforts were focussed on better managing costs, including continued high fuel costs and enhancing productivity to maintain their position as a highly relevant player in a growing market. After struggling for years to cope with high costs amid intense competition from regional and international rivals, a thorough review of MAS productivity is critical to ensure its long-term sustainability.

The primary objectives of this study are to examine the total factor productivity (TFP) growth of MAS and investigate the driving factors on the overall performance of MAS from 1980 to 2013. The findings of the study are expected to draw attention to existing theoretical and practical challenges in measuring airline productivity for policy formulation. The remainder of this study is

* Corresponding author.
E-mail address: kfsee@usm.my (K.F. See).

[1] From September 2015 onward, MAS is known as Malaysia Airlines Berhad (however, for convenience of analysis, this entity is referred to as MAS).

[2] First Business Turnaround Plan (BTP 1) was launched on 27 February 2006 which covered the period of 2006–2008.

[3] Second Business Turnaround Plan (BTP 2) was launched on 1 February 2008 which covered the period of 2008–2012.

http://dx.doi.org/10.1016/j.retrec.2016.07.004
0739-8859/

organised as follows: Section 2 provides a brief background and development on MAS. Methodology and data choices are discussed in Section 3. Section 4 presents the empirical results, and the concluding remarks follow in the final section.

2. Background of MAS

MAS was incorporated in 1972. Prior to 1985, MAS was owned and operated by the Malaysian government. With the objectives to reduce the government administrative and financial burdens, MAS became the first government agency to be privatised. MAS shares were then listed on Kuala Lumpur Stock Exchange (later renamed and known as Bursa Malaysia) in 1985. According to Eckel, Eckel, and Singal (1997), there are three objectives for a company to be privatised, namely: (i) the ownership changes from the government to private hands; (ii) the company's objective changes to profit maximisation; and (iii) changes in regulation designed to enhance competition in product markets are likely to occur. Several studies (e.g., Galal, Jones, Tandon, & Vogelsang, 1994; Megginson, Nash, & Randenborgh, 1994) have demonstrated that privatisation improves economic efficiency of airlines.

Despite the privatisation effort, MAS is not a totally private company, as the government has a controlling stake of 70 per cent thus maintaining its control in steering the decision-making process. As a result, MAS is constrained from freely making strategic decisions such as changing destinations, routes and pricing within its domestic and international markets, which is significant to its survival. After the loss of MH370 in March 2014 and another Boeing 777 in Ukraine in July 2014, MAS has been renationalised. MAS is fully a state-owned company after the company was delisted from Bursa Malaysia at the end of 2014.

Fig. 1 presents the trends in MAS traffic volume from 1980 to 2013. In 1980, the number of passengers was 4.1 million, cargo and mail measured 119.8 million tonne kilometres and the network size recorded was 87,467 kilometres. Although the financial crisis and disease outbreak had a great impact on the Asian economy, MAS traffic volume (except for cargo and mail traffic) has shown an increasing trend. In 2013, the volume of passengers was 20.7 million, cargo and mail measured 2005 million tonne kilometres, and the total network size was 302,884 kilometres. Overall, the table reveals that these figures continue to grow during the period. However, cargo traffic fluctuated between 2004 and 2010, reflecting the general weak global economic conditions, soaring fuel costs and high operational expenses.

Table 1 provides a snapshot of the operations review in the period 1980–2013. Although many initiatives were implemented to drive revenue and enhance productivity, the positive growth in available seat kilometres and load factor is insufficient to withstand the increasing costs in the airline industry. The maintenance cost for the ageing fleet and expensive investment in new fleet, products and service to strengthen the airline's brand position is vital to remain relevant. Additionally, a large growth of employee strength implies that MAS must pay sizeable salaries and perquisites to its staff, as shown in Table 1.

Table 1
Operations review of MAS, 1980–2013.

Variable	Unit	1980	1990	2000	2010	2013
Available seat kilometres	Million seat kilometres	6171	17,258	51,238	50,818	59,932
Load factor	%	67	68.9	66.8	75.4	76.7
Full-time employees equivalent	Headcount	9327	16,149	21,518	20,000	19,577

Source: MAS annual reports.

A commercially sustainable flagship carrier is central to the broader geo-political and macroeconomic national objectives of global connectivity and trade linkages for Malaysia. In 2013, MAS flew approximately 20.7 million passengers annually to 850 destinations in 150 countries across the Oneworld alliance network. MAS demonstrates an extensive record of excellence, having received more than 100 awards, including Skytrax 5-star Airline and World's Best Cabin Crew in the last decade. A brief background of MAS is presented in Table 2.

3. Methodology and data

Analyses of airline performance have employed several types of statistical methods, including data envelopment analysis (DEA) (Assaf & Josiassen, 2011; Barbot, Costa, & Sochirca, 2008), structural equation modelling (Jenatabadi & Ismail, 2014), regression (Clougherty & Zhang, 2009; Hung & Liu, 2005), as well as multiple criteria decision-making (Hsu & Liou, 2013). In general, DEA method has been widely used for performance evaluation among the airline industry. Although DEA is a popular approach that is used in many empirical studies, a price-based index number method is the only method that allows us to calculate the level of productivity growth of a single airline company. Three common price-based index number methods are used in constructing TFP indices, the Laspeyres, Törnqvist and Fisher. In this study, we prefer the second-order indices, either the Törnqvist or Fisher indices, to calculate the TFP changes. From the literature survey, the Törnqvist index is preferred method and has been adopted in a number of studies, such as See and Coelli (2014), Marques (2011), Bergamini, Gitto, and Mancuso (2010) and Rungsuriyawiboon and Coelli

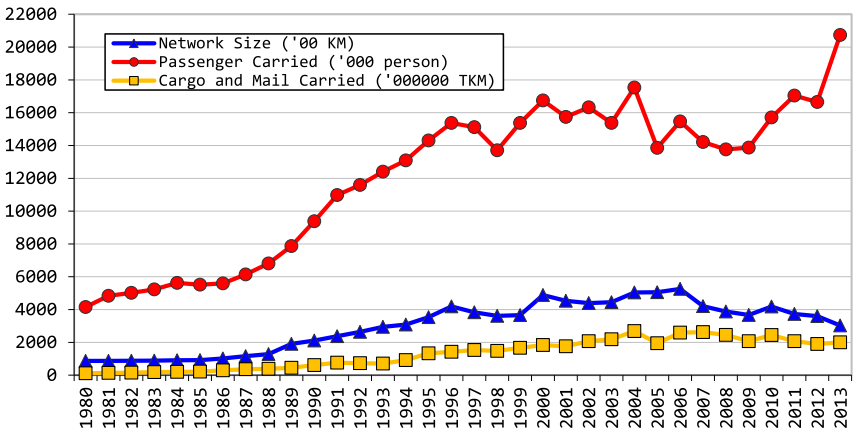

Fig. 1. MAS traffic statistics, 1980–2013. TKM = Tonne kilometre; KM = Kilometre.

Please cite this article in press as: See, K. F., & Abdul Rashid, A., Total factor productivity analysis of Malaysia Airlines: Lessons from the past and directions for the future, *Research in Transportation Economics* (2016), http://dx.doi.org/10.1016/j.retrec.2016.07.004