



Total factor productivity measures for Telstra

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Abstract

Using the Divisia indexation procedure to construct output and input indices for Telstra, this study estimated total factor productivity (TFP) growth rates for the period, 1980–1997. The study reveals that Telstra's TFP growth rates were significantly higher in the post-reform period compared to the pre-reform period. The study further reveals that the terms of trade for Telstra, defined as the ratio of output prices received and input prices paid by Telstra, has declined more sharply in recent years. This reflects Telstra's endeavour, under the competitive pressure, to share productivity gains with consumers. © 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Telstra; Total Factor Productivity (TFP); Australia

1. Introduction

Estimates of total factor productivity measure (TFP) for a firm involves construction of an aggregate output index and an aggregate input index. The ratio of the two indices provides the TFP measure that includes the impact of technical progress, economies of scale or of scope and managerial improvements. Although there are ways of decomposing the estimated TFP, an aggregate measure will be sufficient for our purpose. The purpose of the present study is to provide insight into the sharing of efficiency gains between Telstra and its customers.

The present study is an update of the BIE (1995) using more recent data sourced from Telstra and ABS. The methodology used in constructing the input and output indices is basically the same as BIE (1995) and is described briefly in Section 2 of this paper. Section 3 provides estimates of TFP measures for Telstra and Section 4 provides a summary and conclusions of the paper.

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2. The methodology

A full description of the methodology is provided in Appendix A

2.1. Output

In estimating Telstra's output index, BIE (1995) first divided telecommunications services into seven main activities including the number of telephone calls, total number of telephones rented, new services connected, total number of telex services in operation, total number of telex calls, international calls and other services. These services were then aggregated into an index using the Divisia procedure.¹

Classification of products and the details of reporting have changed since 1994. As a result, the BIE estimates cannot be updated using the same data formats. Some old products such as telex calls and connections have almost disappeared from the market, while some new products like fax lines, ISDN and mobiles have become prominent in the recent past.

Table 1 shows that there has been a significant structural change in demand for Telstra's services in recent times. In 1994, voice services represented more than 56 percent and data and other services about 44 percent of Telstra's revenue. In 1997, contribution of voice services declined to 53 percent and that of data and other services grew to 47 percent.

Within the voice services, local calls remained stable at 32 percent while international calls declined from 19 to 16 percent, trunk calls from 34 percent to only 29 percent over the three years period ending with 1997.

The decline in revenue shares, as described above, reflects average decline in prices while quantity of services continued to increase. Between 1995 and 1997, the number of local calls, trunk calls and international calls have increased by 10.7, 4.5 and 9.4 percent, respectively, while that of mobile calls increased by 63 percent (see Table 2). Revenue shares of mobiles increased from 15.5 to 23.5 percent between 1994 and 1997 (see Table 1).

Table 1
Revenue shares for various Telstra services, 1994–1997^a

| Period | Total services (%) | | | Voice services (%) | | | |
|--------|--------------------|------|-------|--------------------|-------|---------------|--------|
| | Calls | Data | Other | Local | Trunk | International | Mobile |
| 1994 | 56.1 | 13.0 | 30.9 | 31.6 | 33.6 | 19.3 | 15.5 |
| 1995 | 55.0 | 9.7 | 35.3 | 32.4 | 34.4 | 18.2 | 15.0 |
| 1996 | 53.9 | 10.3 | 35.8 | 32.5 | 30.5 | 16.3 | 20.7 |
| 1997 | 52.8 | 11.8 | 35.4 | 31.6 | 29.1 | 15.9 | 23.5 |

^aSource: BIE (1995), Telstra Annual Reports and ABS.

¹ For details of the indexation procedure, see Diewert (1993).

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