An Analysis of Economic Profitability of Municipal Transport Undertakings in India*

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Abstract

This paper analyses economic profitability of India's major Municipal Transport Undertakings (MTUs) through an examination of the changes in their productivity and the ability to markup prices above costs. Annual statistics for a sample of seven MTUs, for which consistent data are available from 1990-91 to 2000-01, are used for this analysis. The study reveals that majority of the MTUs could not improve their economic profitability between 1990-91 and 2000-01 mainly due to decrease in their productivity. Even the largest MTU in India - Brihan Mumbai Electric Supply & Transport Undertaking (BEST) could not improve its economic profitability significantly despite the fact that its average fare increased at greater rate than increase in its input factor prices. Only one MTU - Bangalore Metropolitan Transport Corporation (BMTC), which was established recently after bifurcation of Karnataka State Road Transport Corporation (KnSRTC), managed to increase its economic profitability significantly thanks to tremendous growth in its productivity although it was subjected to a more rapid rise in its input prices than output prices. It was found that during recent years none of the MTUs could raise traffic revenue sufficient to recover their respective operating cost with the sole exception of BMTC during the year 2000-01.

Key Words: Profitability, Productivity, Municipal Transport Undertakings

JEL Classification: L92, M20, R40

1. Introduction

Currently, there are sixty-four publicly owned State Transport Undertakings (STUs) in India. Out of these, nine are Municipal Transport Undertakings (MTUs). MTUs, by their very nature, are urban transport undertakings, catering mainly to those living in the municipal area. These undertakings are managed by a sub-committee, known as transport sub-committee, of the municipal council, headed by one of the councilors or members as chairman. Although the municipal undertakings are expected to respond to the transportation needs of the urban dwellers, they are languishing due to lack of resources. Most of the MTUs are making huge financial losses over the years. The result is that several of them are running fleets, which have long out-lived its utility, resulting in poor quality of operation.

The prime objective of this paper is to analyze the economic profitability of these undertakings. For this, we use a model to decompose changes in economic profitability into two components capturing changes in productivity and price recovery ability (Miller, 1984; Banker et al., 1993, 1996). A yearly panel data of seven major MTUs, for which consistent data are available, over the 1990-91 to 2000-01 period is used for this study. A productivity index program, TFPIP Version 1.0, is used for total factor productivity computation.

The remainder of this paper is organized as follows: Section 2 reviews the link between economic profitability, productivity and price recovery; Section 3 briefly describes the sample undertakings and the data; Section 4 deals with economic profitability, productivity and price recovery measurement; Section 5 explain the changes in performance of sample MTUs; and Section 6 contains a summary and concluding remarks.

2. The link between economic profitability, productivity and price recovery

It is easy to show that productivity growth and strong financial performance do not necessarily go together. There are highly productive firms that are financially weak and there are inefficient producers that may make substantial profit. Nevertheless, there is a direct link between economic profitability, productivity and prices. To illustrate this link, we use simple algebra for two time periods, T-1 and T. Let P_{T-1} and P_T denote output prices (indices); Y_{T-1} and Y_T the corresponding output quantities (indices); W_{T-1} and W_T denote input prices (indices); and X_{T-1} and X_T the corresponding input quantities (indices). The π is a measure of economic profit, which is, for analytical convenience, defined as the ratio of revenues R to costs C rather than their difference. Therefore, change in economic profit can be written as:

$$\frac{\pi_T}{\pi_{T-1}} = \frac{R_T / C_T}{R_{T-1} / C_{T-1}} = \frac{(P_T Y_T) / (W_T X_T)}{(P_{T-1} Y_{T-1}) / (W_{T-1} X_{T-1})} \qquad \textbf{(1)}$$

Equation **(1)** can be rewritten as:

$$\frac{\pi_T}{\pi_{T-1}} = \left(\frac{Y_T / X_T}{Y_{T-1} / X_{T-1}} \right) \left(\frac{P_T / W_T}{P_{T-1} / W_{T-1}} \right) \qquad \textbf{(2)}$$

Since Total Factor Productivity (TFP)[1] is defined as a ratio of an aggregate output quantity index to aggregate input quantity index and Price Recovery (PR)[2] is defined as a ratio of an aggregate output price index to aggregate input price index, any change in economic profit of the firm reflects the change in productivity and change in price recovery. The first half of the right hand side of equation **(2)** is TFP growth whereas second half is PR growth. Therefore, equation **(2)** can be rewritten as:

$$\frac{\pi_T}{\pi_{T-1}} = \left(\frac{TFP_T}{TFP_{T-1}}\right)\left(\frac{PR_T}{PR_{T-1}}\right) \qquad \textbf{(3)}$$

Equation **(3)** reveals that improvement in productivity and/or price recovery will lead to improvement in profitability. This decomposition is useful for identifying to what extent

[1] TFP is the broadest measure of productivity, and the only measure whose increase is unambiguously beneficial, in the sense that it corresponds to a decline in the unit cost of production. TFP can either be measured using a non-parametric index number approach or through the econometric approach where productivity is estimated as the time shift in a cost (or production) function. The TFP measurement and its interpretation by these two approaches are not necessarily identical, but these differences can be ignored for this study. The index number approach is a "gross" measure of TFP; it does not distinguish between sources of productivity growth. Econometric estimates of TFP are "technological shift" measure; they exclude productivity gains from economies of scale or similar endogenous production characteristics (see, for example, Diewert, 1992).

[2] The ratio of an aggregate output price index to aggregate input price index is usually labeled as "price recovery" or "price cost recovery" in the management literature (see for example, Brayton, 1985; Miller and Mohan, 1989; and Aboganda, 1994) or sometimes as "price performance" (Sink et al., 1984). For this study, we termed it as price recovery.

the change in profitability is influenced by changes in output and input prices and by changes in productivity.

3. Sample undertakings and the data

3.1. Sample undertakings

Municipal transport undertakings in India are prevalent only in the States of Maharashtra. Currently, there are nine municipal transport undertakings in India out of which seven are operating in Maharashtra alone. Besides Maharashtra, Karnataka and Gujarat are the other two states of the country where municipal transport undertakings are operating. Here is the current list of Municipal Undertakings in India (with number of buses held during 2000-01):

1. Brihan Mumbai Electric Supply & Transport Undertaking (BEST) – 3,432 buses
2. Bangalore Metropolitan Transport Corporation (BMTC) – 2,264 buses
3. Ahmedabad Municipal Transport Service (AMTS) – 905 buses
4. Pune Municipal Transport (PMT) – 812 buses
5. Thane Municipal Transport Undertaking (TMTU) – 246 buses
6. Pimpri Chinchwad Municipal Transport (PCMT) – 232 buses
7. Kolhapur Municipal Transport Undertaking (KMTU) – 110 buses
8. Navi Mumbai Municipal Transport (NMMT) – N.A.
9. Solapur Municipal Transport Undertaking (SMTU) – N.A.

Due to unavailability of data pertaining to NMMT and SMTU, they are excluded from the sample of this study. The sample includes undertakings from Maharashtra,

Karnataka, and Gujarat. Table 1 provides some recent descriptive statistics of the sample undertakings. The size of the undertakings, as measured by revenue passenger-kilometers (PKm) in 2000-01, ranges from 119 million PKm for KMTU to 10090 million PKm for BEST. Fleet strength of sample MTUs also varies drastically, from 110 buses for KMTU to 3432 buses for BEST. In all respect, BEST is the largest MTU whereas KMTU is the smallest one.

Table 1. Descriptive statistics of the sample undertakings during 2000-01

	Pass.-Km (million)	Bus-Km (million)	No. of buses held	No. of employees	Pass. carried (million)
BEST	**10090**	**244.1**	**3432**	**37864**	**1511.6**
BMTC	6517	172.0	2264	13594	949.0
AMTS	1969	55.2	905	6970	247.8
PMT	1652	58.6	812	6833	153.0
TMTU	706	17.1	246	2561	80.2
PCMT	321	14.7	232	2007	22.3
KMTU	**119**	**5.6**	**110**	**933**	**19.7**

3.2. Data source

A panel of seven MTUs over the period 1990-91 to 2000-01 forms the primary data base for this study. The annual data were compiled mainly from *Performance Statistics of STUs, 1990-91 to 2000-01* published for the ASSOCIATION OF STATE ROAD TRANSPORT UNDERTAKINGS, NEW DELHI by the CENTRAL INSTITUTE OF ROAD TRANSPORT, PUNE, INDIA.

4. Measuring economic profitability, productivity and price recovery

4.1. Measuring economic profitability of sample undertakings

Profitability performance of any organization depends on revenue in comparison to costs. Here in this case, revenue has two components: traffic revenue and non-traffic revenue. Traffic revenue is nothing but total earnings from passengers whereas non-traffic revenue includes earnings from advertisement, shops in depot, subsidy from local government for providing concessional travel facility to students, freedom fighters, elected representatives, senior citizens, journalists etc., and any other revenue from non-core business. Non-traffic revenue component of total revenue is not homogeneous across MTUs. For example, during the year 2000-01, it varied from 1.28% of total revenue for TMTU to 32.84% of total revenue for KMTU. As far as cost in MTUs is concerned, it depends on personnel cost, fuel (diesel) cost, capital (bus) cost including maintenance cost and interest payment, and taxes paid to the government. Taxes, which include passenger tax, motor vehicle tax and other miscellaneous taxes, are also not homogenous across MTUs. For example, during the year 2000-01, it varied from 0.96% of total cost for AMTS to 8.90% of total cost for TMTU. Since non-traffic revenue component of total revenue and tax component of total cost is not homogeneous across MTUs, total revenue minus total cost (or a ratio of total revenue to total cost) will not be a robust measure of profitability. To make a proper inter-firm comparison of profitability, heterogeneous component of both revenue and costs should be excluded.

However, total revenue minus total cost (or total revenue to total cost ratio) can be used to measure the accounting profitability of MTUs. Since traffic revenue (total revenue

minus non-traffic revenue) and operating cost (total cost minus taxes paid to the government) is homogeneous across MTUs, to make a proper inter-firm comparison we can define economic profitability as traffic revenue minus operating cost (or a ratio of traffic revenue to operating cost).

Table 2 presents accounting as well as economic profitability of MTUs during the year 2000-01. This Table reveals that profitability performance varies greatly among the sample undertakings. BMTC is the only municipal transport undertaking in India, which experienced accounting as well as economic profit during 2000-01. All other undertakings incurred huge losses. Accounting loss during 2000-01 varied from Rs. 2.59 million for KMTU to Rs. 1736.63 million for BEST whereas economic loss during the same year varied from Rs. 3.51 million for TMTU to Rs. 1875.45 million for BEST. It is interesting to note that BMTC, which experienced accounting profit of Rs. 121.57 million during 2000-01, could not achieve the same level of economic profit since non-traffic revenue, majority of which is reimbursement of concessional travel facility, played an important role in inflating the level of accounting profit.

Table 2. Accounting as well as economic profitability of MTUs during 2000-01; all monetary units in Rs. million.

	Total revenue	Traffic revenue	Total cost	Total operating cost	Accounting profit	Economic profit
BEST	6961.03	6464.99	8697.66	8340.45	-1736.63	-1875.45
BMTC	2642.19	2448.65	2520.62	2446.44	121.57	2.21
AMTS	854.18	822.31	1375.23	1361.99	-521.05	-539.68
PMT	928.24	885.89	1060.96	1026.15	-132.73	-140.26
TMTU	362.96	358.31	397.16	361.82	-34.20	-3.51
PCMT	183.29	172.34	233.77	223.82	-50.48	-51.49
KMTU	112.17	75.33	114.76	108.39	-2.59	-33.06

Table 3 presents unit free measure of accounting as well as economic profitability of sample MTUs during the year 1990-91 and 2000-01. Profitability figures for BMTC belong to the year 1997-98 instead of 1990-91 since before 1997-98 BMTC was part of Karnataka State Road Transport Corporation (KnSRTC). This Table reveals that except BMTC and BEST, none of the sample MTUs could improve their profitability performance. Moreover, improvement in BEST's profitability performance is only marginal and still it is making a loss of around 20% every year.

Table 3. Changes in accounting as well as economic profitability of MTUs from 1990-91 to 2000-01.

	Accounting profitability (Total revenue to total cost ratio)		Economic profitability (Traffic revenue to operating cost ratio)	
	1990-91	2000-01	1990-91	2000-01
BEST	0.79	0.80	0.75	0.78
BMTC	0.94 (1997-98)	1.05	0.89 (1997-98)	1.00
AMTS	0.77	0.62	0.69	0.60
PMT	0.92	0.87	0.91	0.86
TMTU	0.95	0.91	1.03	0.99
PCMT	0.94	0.78	0.96	0.77
KMTU	0.98	0.98	1.01	0.70

4.2. Measuring productivity of sample undertakings

TFP has been recognized as a robust measure of productivity in the management and economic literature. Therefore, we decided to measure the productivity performance of individual MTU by quantifying its level as well as growth of TFP. We use index number approach, which has the advantage of not requiring direct estimation of the underlying technology and therefore, of not requiring econometric specification and estimation of

technology. To compute the index of TFP for each undertaking, we follow a procedure proposed by Christensen and Jorgenson (1970):[3]

$$\ln\left(\frac{TFP_T}{TFP_{T-1}}\right)=\sum_i\left(\frac{\Re_{iT}+\Re_{iT-1}}{2}\right)\ln\left(\frac{Y_{iT}}{Y_{iT-1}}\right)-\sum_j\left(\frac{S_{jT}+S_{jT-1}}{2}\right)\ln\left(\frac{X_{jT}}{X_{jT-1}}\right) \quad \textbf{(4)}$$

where T and $T-1$ are adjacent time periods, the Y_{iT} are output indices, the X_{jT} are input indices, the $\Re_{iT}$ are output revenue shares, and the S_{jT} are input cost shares.[4]

For this study, we have used one output and three inputs to calculate the annual TFP indices for various municipal transport undertakings from 1990-91 to 2000-01. Output indices are based on revenue passenger-kilometers (PKm). Total number of employees, total quantity of fuel (diesel) consumed, and total number of buses held are considered as useful input factors to produce the output. Total operating cost is defined as total cost minus taxes[5]

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[3] Where there is a single output, factor specific productivity indices (often called partial factor productivity indices) can be constructed for each input which essentially describes the average product of labor, capital, etc. Partial factor productivity indices are potentially misleading because what passes for a difference in productivity, may in fact merely represent a different mix of input use. For example, using a more labor intensive (less capital intensive) production technology would increase the partial factor productivity index for capital. This would result even if the more labor intensive technology was more costly, and consequently, a method that should be avoided.

[4] Diewert (1976) showed that **(4)** can be derived from a homogeneous translog transformation function that is separable in outputs and inputs, and exhibits neutral differences in technology. Caves et al. (1982b) have shown that separability and neutrality are not required to derive **(4)** from a homogeneous translog transformation function.

[5] It includes passenger tax, M. V. tax, other taxes on buses, and miscellanious taxes.

paid to the government. It can be factorized in three components: labor, fuel, and bus costs. Total expenditure on employees and total spending on diesel is taken as cost of labor and cost of fuel respectively. The remainder is considered as cost of bus. So, accordingly **(4)** is modified as follows:

$$\ln\left(\frac{TFP_T}{TFP_{T-1}}\right) = \ln\left(\frac{Y_T}{Y_{T-1}}\right) - \sum_j \left(\frac{S_{jT} + S_{jT-1}}{2}\right) \ln\left(\frac{X_{jT}}{X_{jT-1}}\right) \qquad \textbf{(5)}$$

where j = labor, diesel, and bus.

Equation **(5)** is used to compute the TFP indices for each undertaking from 1990-91 to 2000-01. We have also constructed output and aggregate input quantity indices. These indices, normalized so that their level in 1990-91 is 1.000, are presented in Figure 1 to 7. Figure 8 presents average annual percentage change in output, aggregate input and productivity for sample MTUs. TFP result shows that only BMTC and AMTS could achieve positive productivity growth. BMTC managed to attain a tremendous growth in its productivity, around 14% per annum during 1997-98 to 2000-01, primarily due to huge increase in its output, around 21% per annum during 1997-98 to 2000-01, without significant increase in its workforce. Productivity growth in AMTS is relatively modest, around 1.14% per annum during 1990-91 to 2000-01. Although, the level of productivity of AMTS during 2000-01 is 12% higher than that of 1990-91, there is decline in its productivity from 1996-97 onwards largely due to decline in its level of output coupled with increase in almost all the input factors.

The largest MTU in India, BEST, experienced a decline of around 1.6% per annum in its productivity during the last decade. BEST's output increased just by 10% in a span of

10 years whereas its aggregate input increased by 29% during the same period. Higher increase in aggregate input in comparison to output is mainly due to huge increase in its employee cost. During 1990-91 to 2000-01, number of employees in BEST increased by 25% whereas wage rate increased by 365% which has resulted into steep increase in employee cost share from 48.8% to 75.4%. This is one of the primary reasons of decline in its productivity.

PMT has also experienced decline in its productivity. Although its productivity was increasing from 1990-91 to 1996-97, there has been a steep decline afterwards. During 2000-01, PMT's productivity level was just 80% of the productivity level that corresponds to the year 1990-91. This is due to 37% increase in its aggregate input in comparison to just 10% increase in its output in a span of 10 years.

Among sample MTUs, BMTC and TMTU achieved tremendous growth in their output, around 21% and 14% per annum respectively over the sample period. BMTC required just 5.8% growth per annum in its inputs to achieve 21% growth per annum in its output whereas TMTU required around 14.6% per annum growth in its inputs to achieve 14% growth per annum in its output. Consequently, TMTU experienced a marginal decline in its productivity during 1990-91 to 2000-01. One should note that TMTU's productivity during 1990-91 was higher than that of any other year of the sample period.

There are two MTUs – PCMT and KMTU, which have experienced decline in their productivity as well as output during 1990-91 to 2000-01. However, PCMT follows different pattern of productivity as well as output change than KMTU. Productivity and output of PCMT was increasing during first half but declined rapidly during second half of 1990s.

KMTU's productivity as well as output were stable till 1992-93 and started declining afterwards. Overall, from 1990-91 to 2000-01, KMTU's productivity and output declined at greater rate than its other counterparts.

Figure 1. Output, aggregate input and TFP indices for BEST

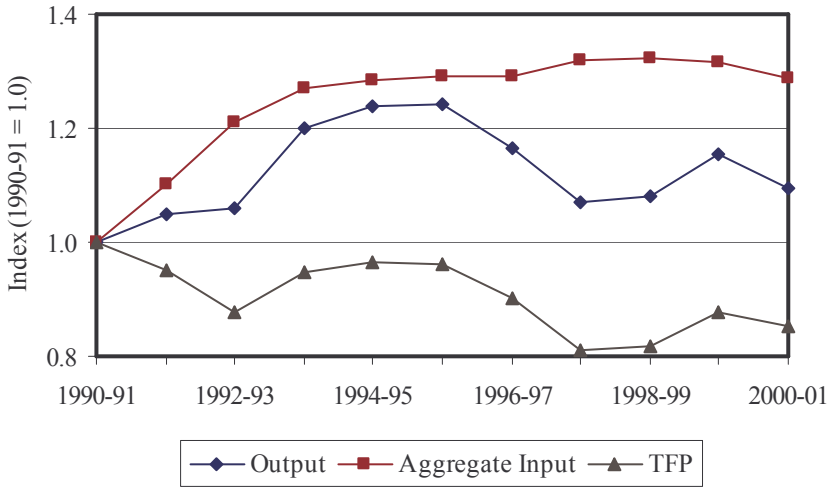


Figure 2. Output, aggregate input and TFP indices for BMTC

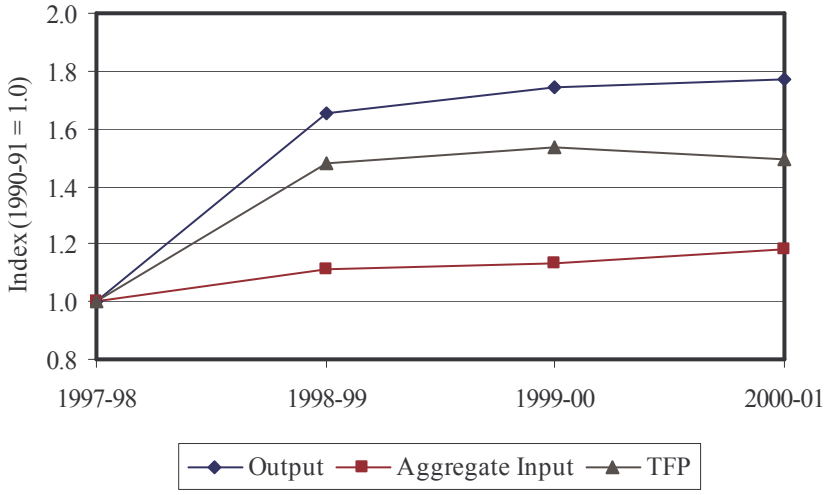


Figure 3. Output, aggregate input and TFP indices for AMTS

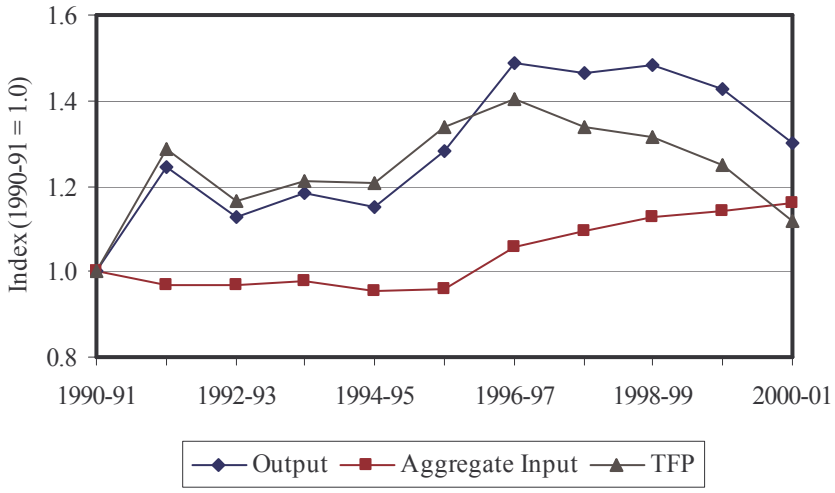


Figure 4. Output, aggregate input and TFP indices for PMT

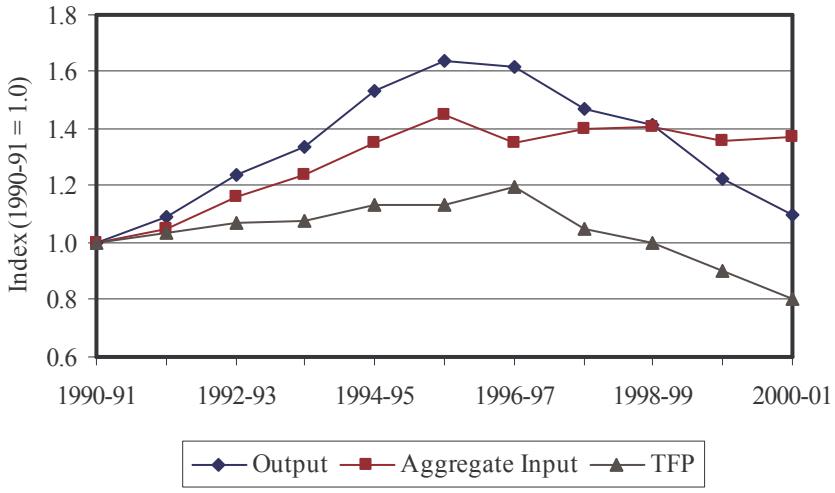


Figure 5. Output, aggregate input and TFP indices for TMTU

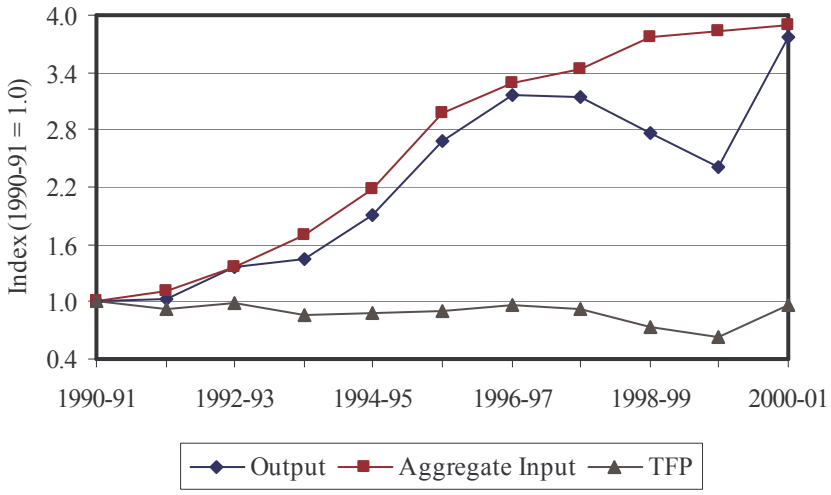


Figure 6. Output, aggregate input and TFP indices for PCMT

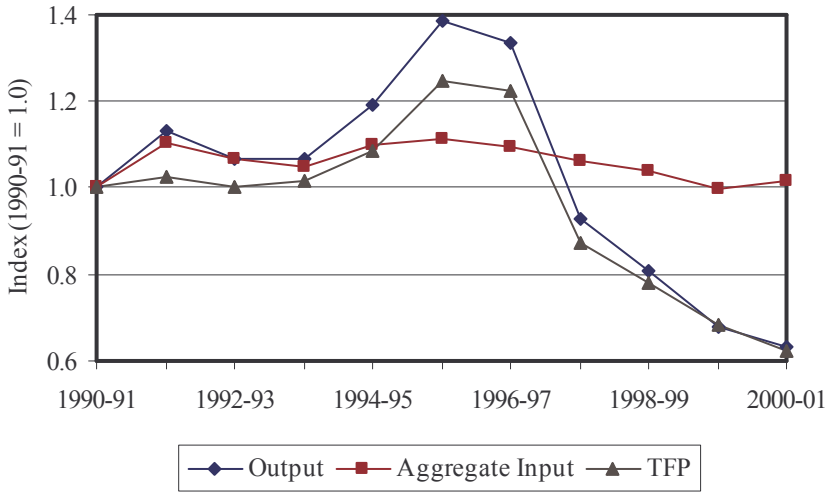


Figure 7. Output, aggregate input and TFP indices for KMTU

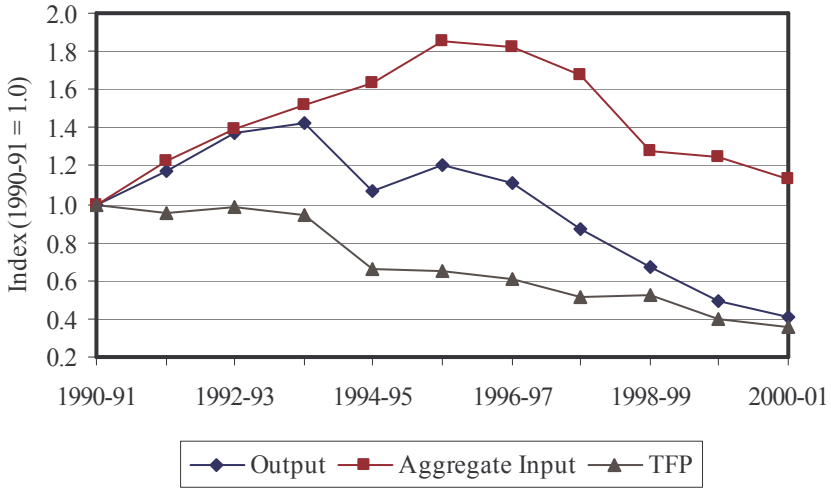
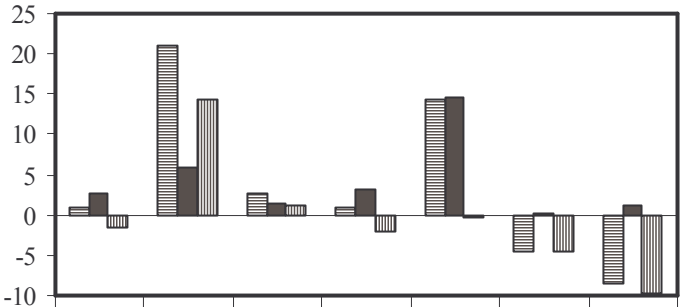


Figure 8. Average annual growth rate in output, aggregate input and productivity across sample MTUs (in percentage)



	BEST	BMTC	AMTS	PMT	TMTU	PCMT	KMTU
Output	0.92	21.02	2.66	0.95	14.20	-4.49	-8.58
Aggregate input	2.55	5.81	1.51	3.19	14.59	0.17	1.28
Productivity	-1.59	14.38	1.14	-2.17	-0.34	-4.65	-9.74

4.3. Measuring price recovery of sample undertakings

Price Recovery index for sample undertakings is computed by dividing output price index by input price index. In this case, output price index is constructed by diving traffic revenue index by the output quantity index. Similarly, the input price index is calculated by dividing operating cost index by the aggregate input quantity index. All indices are set equal to unity in 1990-91 for this analysis. Figure 9 to 15 presents output price index compared to input price index from 1990-91 to 2000-01 for all the sample MTUs starting from BEST to KMTU. Figure 16 presents average annual growth rate in output price, input price and price recovery index for sample MTUs.

Between 1990-91 and 2000-01, four out of seven MTUs experienced higher increase in their output price than input prices. PMT, BEST, PCMT and KMTU's output price (i.e., average fare) increased by 18%, 22%, 29% and 92% respectively higher than the increase in their input factor prices in a span of one decade. Although these MTUs enjoyed increase in their price recovery, the pattern of price recovery is different for different MTUs. Price recovery index for BEST and KMTU was greater than or equal to one whereas it was less than or equal to one for PMT and PCMT for most of the years of the sample period. Price recovery index for PMT and PCMT is higher in 2000-01 in comparison to 1990-91 mainly due to relatively higher growth in their output prices during second half of the sample period.

During the sample period, price recovery index for TMTU is always greater than or equal to one except during 2000-01. Overall, there has been a marginal decline of 1% in TMTU's price recovery between 1990-91 and 2000-01.

BMTC and AMTS are the only MTUs, which could not increase their fare in line with increase in their input factor prices. Price recovery index is consistently below one for these two MTUs over the sample period. One should note that such MTUs require significant productivity growth to improve their profitability performance. If price recovery index is declining i.e., output prices are increasing at lesser rate than that of input factor prices, producer has to achieve productivity growth to check the deterioration in its profitability. And, if price recovery index is increasing, producer's profitability will improve even without significant improvement in its productivity.

Figure 9. Output price, input price and price recovery indices for BEST

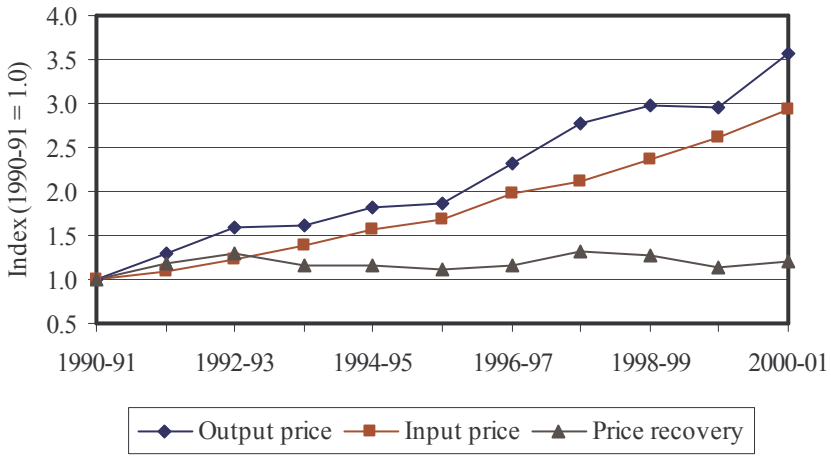


Figure 10. Output price, input price and price recovery indices for BMTC

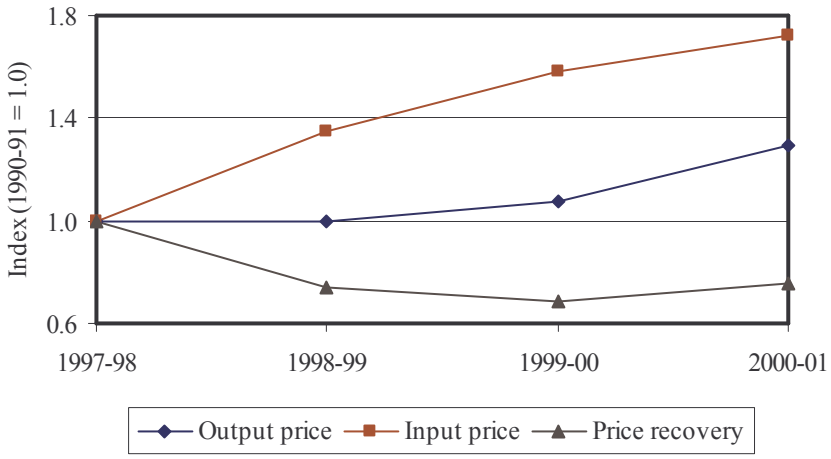


Figure 11. Output price, input price and price recovery indices for AMTS

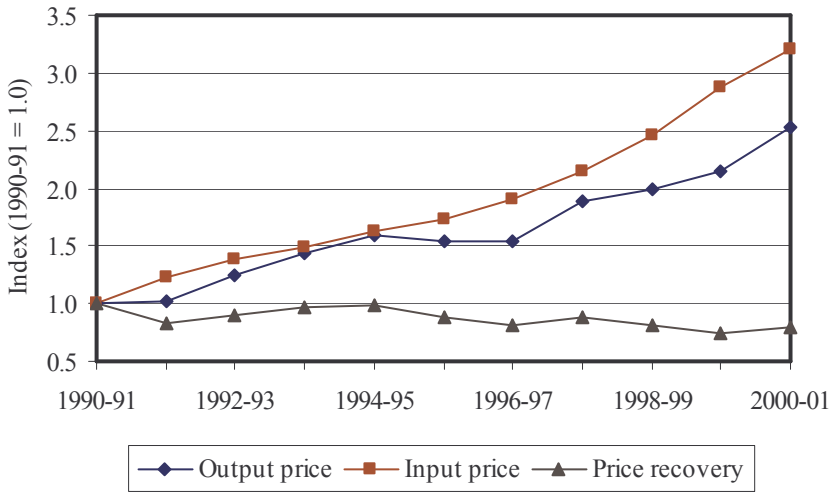


Figure 12. Output price, input price and price recovery indices for PMT

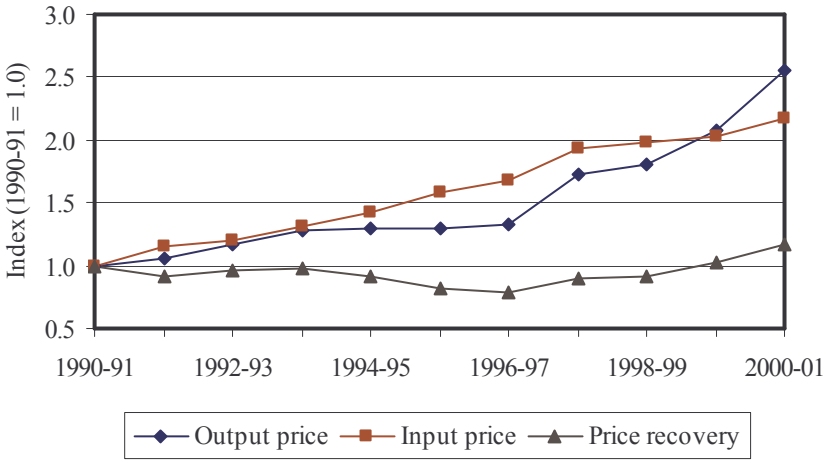


Figure 13. Output price, input price and price recovery indices for TMTU

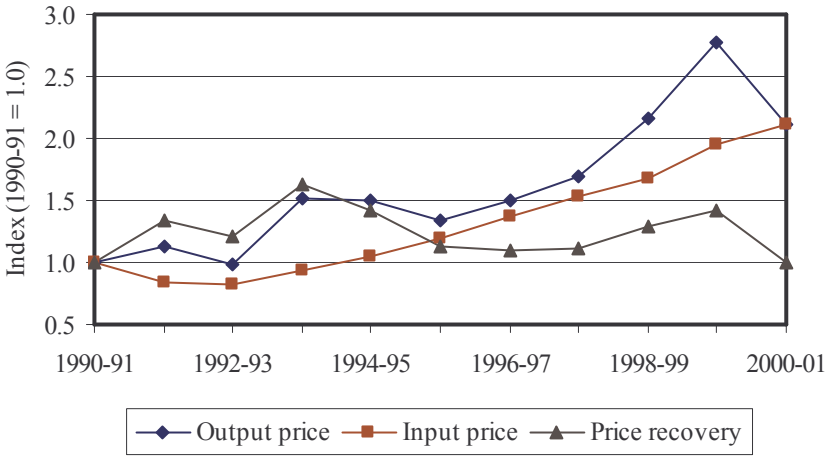


Figure 14. Output price, input price and price recovery indices for PCMT

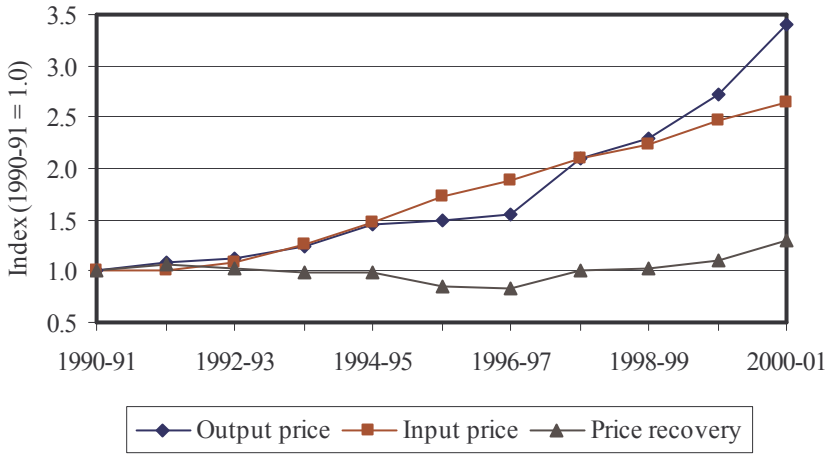


Figure 15. Output price, input price and price recovery indices for KMTU

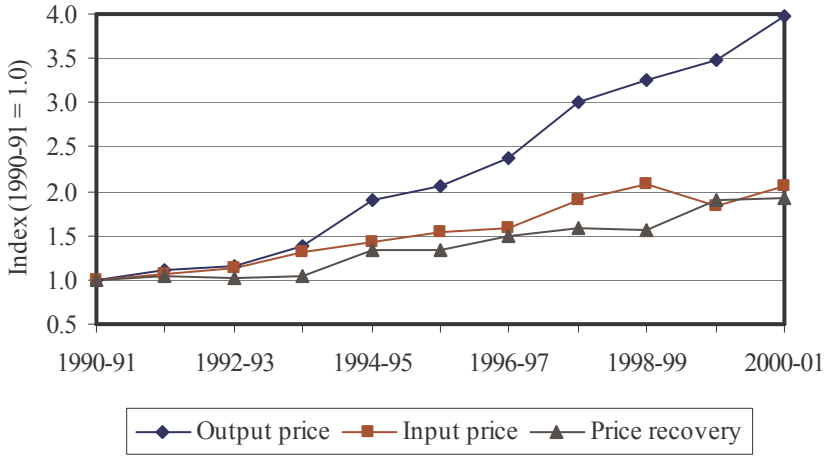
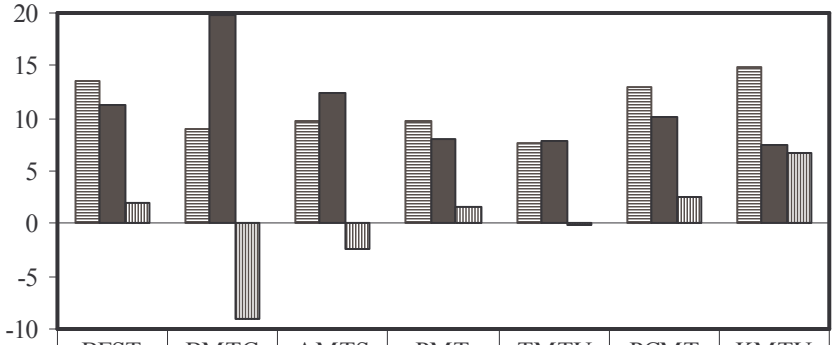


Figure 16. Average annual growth rate in output price, input price and price recovery across sample MTUs (in percentage)



	BEST	BMTC	AMTS	PMT	TMTU	PCMT	KMTU
Output price	13.54	9.02	9.69	9.84	7.75	13.01	14.78
Input price	11.35	19.83	12.36	8.07	7.81	10.17	7.52
Price recovery	1.97	-9.03	-2.37	1.64	-0.05	2.58	6.75

5. Economic profitability, productivity and price recovery pattern

This section examines changes in each MTU's economic profitability in relation to changes in their productivity and price recovery ratio.

Figure 17 to 23 presents economic profitability, productivity and price recovery indices for sample undertakings. Figure 24 presents average annual growth rate in these variables over sample period for each undertaking. Between 1990-91 and 2000-01, five out of seven MTUs could not improve their economic profitability. During 1990s, AMTS, PMT, TMTU, PCMT and KMTU faced decline in their economic profitability by 12%, 5%, 4%, 20% and 31%, respectively. BEST and BMTC were the only two MTUs that could improve their economic profitability. Although BMTC improved its economic profitability by 12% between 1997-98 and 2000-01, improvement in BEST's economic profitability is negligible – merely 3% between 1990-91 and 2000-01. Profitability improvement in BMTC was

primarily due to productivity growth whereas BEST could marginally improve its profitability only through greater increase in its output prices relative to input factor prices. Between 1997-98 and 2000-01, BMTC's productivity increased almost by 50% whereas its price recovery went down by 25%. Contrary to this, between 1990-91 and 2000-01, BEST's productivity decreased by around 15% whereas its price recovery went up by 22%.

Besides BMTC, AMTS is the only sample MTU which experienced productivity growth. Between 1990-91 and 2000-01, although AMTS faced decline in its profitability by 12%, its productivity improved by the same percentage point. Profitability of AMTS declined mainly due to its inability to increase output prices in line with increase in its input factor prices. During 1990-91 to 2000-01, on an average, output prices in AMTS grew at a rate of 9.7% per annum whereas its input factor prices grew at a rate of 12.4% per annum. This has resulted into a decline in its price recovery by around 21% in a span of one decade.

PMT and PCMT have quite similar characteristics of their economic profitability, productivity and price recovery pattern for obvious reasons. Both the MTUs operate in the city of Pune in Maharashtra State. Productivity of both the MTUs is increasing during first half and decreasing during second half of the sample period. Price recovery indices have exactly opposite pattern than that of productivity for both the undertakings. Although both the MTUs faced decline in their economic profitability, PCMT faced greater decline than PMT despite the fact that PCMT enjoyed relatively higher increase in its output prices. This is due to relatively greater decline in PCMT's productivity.

There is one municipal transport undertaking - TMTU whose level of economic profitability, productivity and price recovery during 2000-01 was insignificantly different

from that of 1990-91, although they decreased marginally from 1990-91 to 2000-01. In quantitative term, its economic profitability, productivity and price recovery declined by 4%, 3% and 1%, respectively in a span of one decade. TMTU could not achieve productivity level of 1990-91 during any other years of the sample period. Although during 1993-94 its profitability level was almost 40% higher than that of 1990-91, this was achieved by huge increase in output prices.

The smallest MTU - KMTU faced greatest decline in its economic profitability as well as productivity during 1990s. Although its performance was stable from 1990-91 to 1993-94, there has been uninterrupted decline afterwards. During 2000-01 KMTU's profitability level was just 69% of what was during 1990-91 despite the fact that output prices (relative to input factor prices) in KMTU has increased tremendously from 1990-91 to 2000-01.

Figure 17. Economic profitability, productivity and price recovery indices for BEST

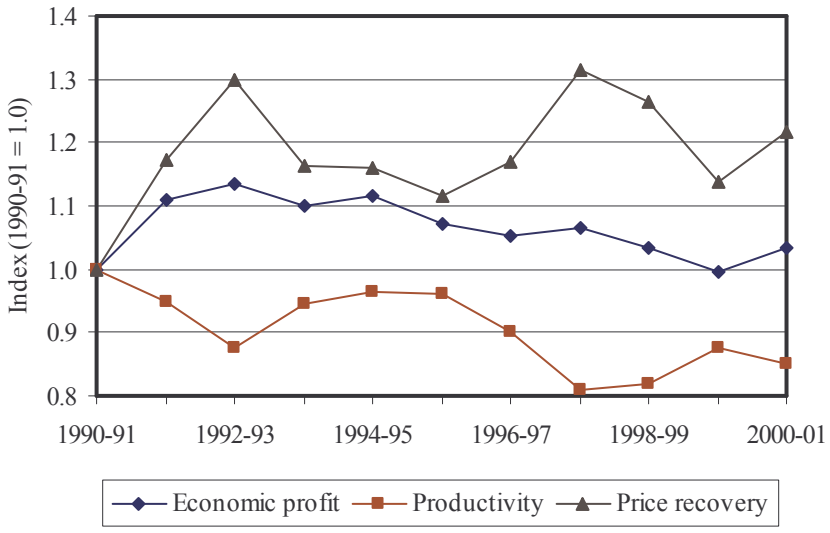


Figure 18. Economic profitability, productivity and price recovery indices for BMTC

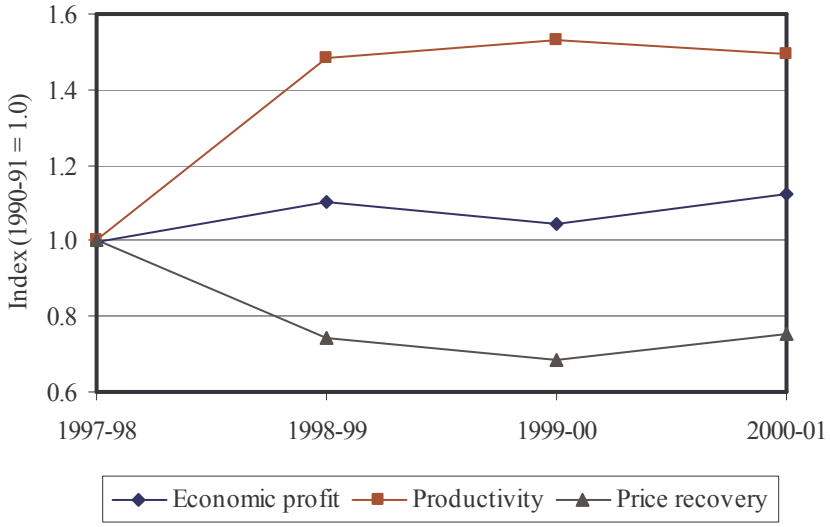


Figure 19. Economic profitability, productivity and price recovery indices for AMTS

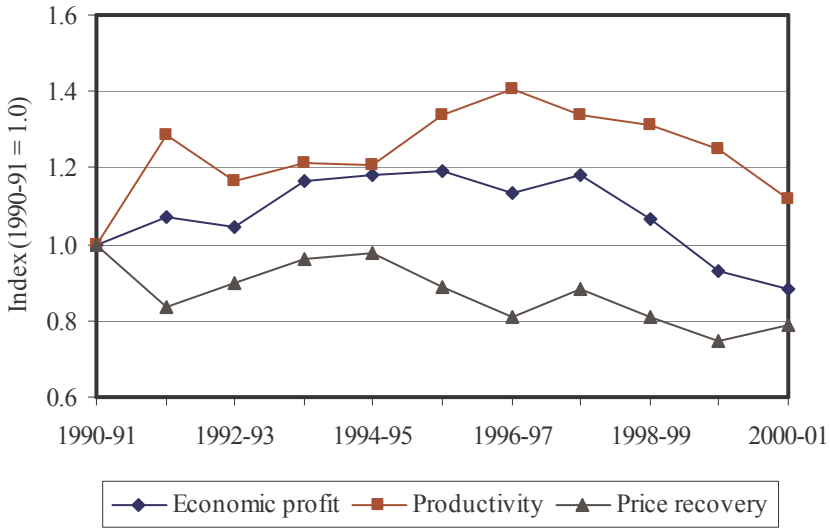


Figure 20. Economic profitability, productivity and price recovery indices for PMT

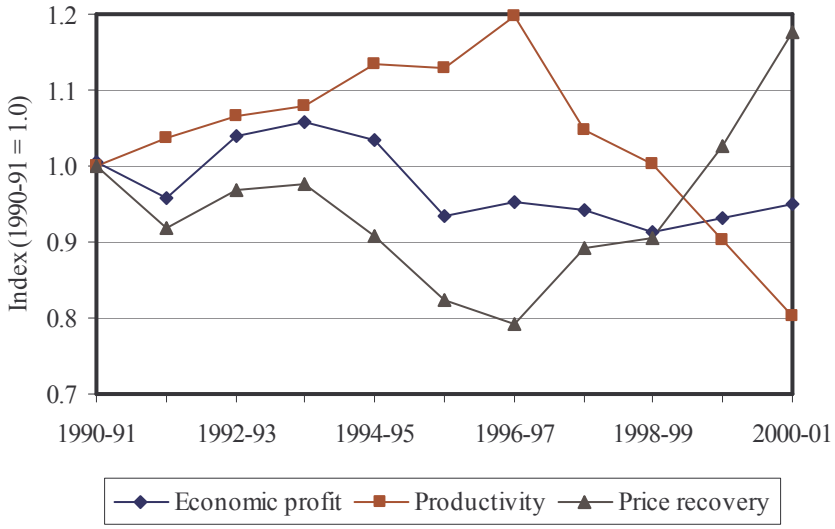


Figure 21. Economic profitability, productivity and price recovery indices for TMTU

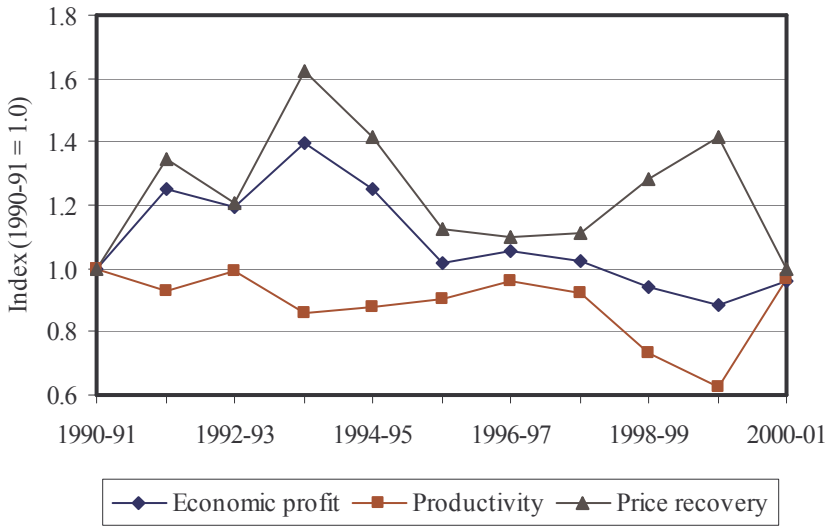


Figure 22. Economic profitability, productivity and price recovery indices for PCMT

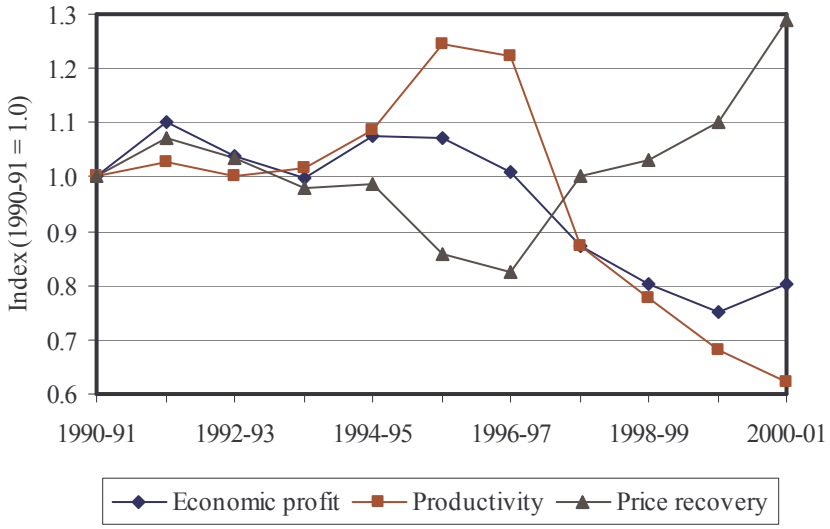


Figure 23. Economic profitability, productivity and price recovery indices for KMTU

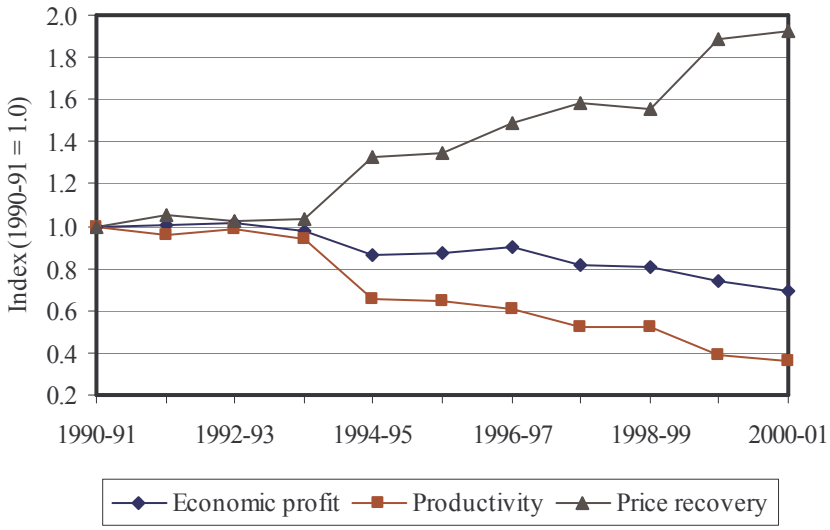
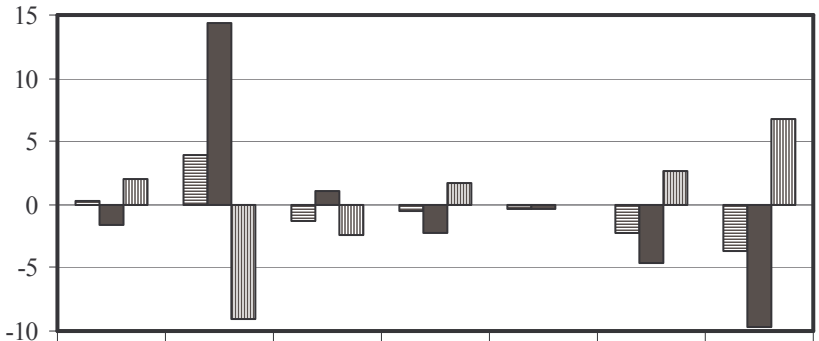


Figure 24. Average annual growth rate in economic profitability, productivity and price recovery indices across MTUs (in percentage)



	BEST	BMTC	AMTS	PMT	TMTU	PCMT	KMTU
Economic profit	0.33	3.99	-1.26	-0.53	-0.39	-2.18	-3.67
Productivity	-1.59	14.38	1.14	-2.17	-0.34	-4.65	-9.74
Price recovery	1.97	-9.03	-2.37	1.64	-0.05	2.58	6.75

6. Summary and concluding remarks

This paper examines changes in economic profitability, productivity and price recovery of the India's seven major Municipal Transport Undertakings during 1990s. Contrary to usual perception, majority of the MTUs increased their output prices at greater rate than that of input factor prices. However, most of them also faced decline in their productivity. As a result, economic profitability of most of the MTUs has deteriorated during 1990s.

The results further show that there are few MTUs e.g., BEST, AMTS and PMT whose traffic revenue never exceeded their respective operating cost during 1990s. Moreover, between 1990-91 and 2000-01, BEST could improve its profitability merely by 3% whereas AMTS and PMT faced decline in their profitability by 12% and 5%,

respectively. As a result, during the year 2000-01, traffic revenue of BEST, AMTS and PMT was just 78%, 60% and 86% respectively of their respective operating cost.

During the early 1990s, some of the MTUs e.g., TMTU, PCMT and KMTU were able to raise their traffic revenue in excess of their respective operating cost at least for few years. However, the economic profitability of all these undertakings declined subsequently. As a result, during the year 2000-01, traffic revenue of TMTU, PCMT and KMTU was 99%, 77% and 70% respectively of their respective operating cost.

One should note that three of the sample MTUs - AMTS, PCMT and KMTU faced huge decline in their economic profitability during second half of 1990s. Between 1995-96 and 2000-01, economic profitability of AMTS, PCMT and KMTU declined by around 26%, 25% and 21% respectively.

BMTC presents a vastly different picture of economic profitability and productivity as compared to its counterparts operating in other municipal areas. It is the only MTU in India, which made accounting as well as economic profit during latest year of the sample. During 2000-01, BMTC's total revenue exceeds its total cost by around 5%. Even in terms of economic profitability (traffic revenue in comparison to operating cost), it is the best performing MTU from last three years of the sample period. However, the level of BMTC's economic profitability is not as superior as its accounting profitability. Traffic revenue of BMTC exceeded its operating cost only during 2000-01.

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