CHAPTER VI

FIXED ASSETS' WORKING LIFE ESTIMATION: ITS IMPACT ON DEPRECIATION COST AND PROFITABILITY
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6.1: Focussing the issue

This chapter aims at studying the effect of working life estimation of fixed assets (with special reference to machine) on depreciation, cost and profitability. Since no situation of over-estimation of working lives was existent at the time of field survey, this chapter has been devoted to showing the impact of under-estimation of machines' working lives with the help of case studies. It deserves mention here at the very outset that neither "repairs and maintenance cost capitalized" nor "enhancement of a machine's life due to capitalized repairs and maintenance cost" has been considered for the purpose of analysis in this chapter. Again, for the purpose of analysis, a machine's life has been considered underestimated when its "running life" has gone beyond its "estimated life".

6.2: Cases after the expiry of working lives of fixed assets

Of the sixty-six industrial organisations studied, none reported to have experienced the situation in which fixed assets became scrapped before the expiry of their estimated working lives. But many enterprises experienced the situations where the assets continued to be productive and useful even after the expiry of their estimated working lives. Table 6.1 which follows, shows the distribution of industrial enterprises whose fixed assets lasted longer than their originally estimated working lives. Data used for the present analysis were taken from the dates of starting commercial production upto the end of year 1980.
<table>
<thead>
<tr>
<th>Event</th>
<th>Textile</th>
<th>Public</th>
<th>Private</th>
<th>N.E.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.E. Number of enterprises</td>
<td>9</td>
<td>4</td>
<td>2</td>
<td>44</td>
<td>55</td>
</tr>
<tr>
<td>N.E. Total</td>
<td>66</td>
<td>50</td>
<td>40</td>
<td>30</td>
<td>186</td>
</tr>
</tbody>
</table>

**Table 6.1: Distribution of enterprises in terms of their experiences regarding the fixed assets in working condition after the expiry of working lives.**

**Experienced**

<table>
<thead>
<tr>
<th>Event</th>
<th>Textile</th>
<th>Public</th>
<th>Private</th>
<th>N.E.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>(72.22)</td>
<td>9</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>(27.78)</td>
<td>10</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td>34</td>
</tr>
</tbody>
</table>

**Did not experience**

<table>
<thead>
<tr>
<th>Event</th>
<th>Textile</th>
<th>Public</th>
<th>Private</th>
<th>N.E.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>(100)</td>
<td>9</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>(100)</td>
<td>10</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td>34</td>
</tr>
</tbody>
</table>

**N.E.** = Number of enterprises.

*Figures in the parentheses indicate percentage.*
It is apparent from the table that in the public sector of chemical and pharmaceutical industry, the highest number of enterprises (100%) experienced the situation of assets having useful lives even after the expiry of their estimated working lives. Next is the number of public sector jute mills (72.22%) which experienced the same situation. Textile mills (69.23%) and steel mills (40%) of the public sector also gained the same experience. So far as private sector is concerned, only chemical and pharmaceutical companies (28.57%) and steel mills (20%) were in possession of such assets as lasted longer than their estimated useful lives. None of private sector jute and textile mills had the experience of such situation. Some of the enterprises having not experienced this situation, reported that it could not happen to them because of their coming into existence quite late in the field. Some of them reported that since they were using reducing-balance method of charging depreciation, book values of fixed assets were still there and so, they could not ascertain whether the estimated working lives of their fixed assets were over or not. The absence of fixed assets' register in most of the enterprises was also one of the reasons for their failure to determine whether the assets' lives expired or not. This information, however, appeared to be somewhat strange to the researcher.

6.3: Case studies showing the effect of underestimation of working lives of machines

With a view to analysing and ascertaining the impact of
the situation of under-estimation of working lives of machines on depreciation rate fixation and thereby on cost of production and profitability, case studies have been made here. For the purpose of case studies, 4 public sector industrial enterprises— one each from jute and chemical and pharmaceutical industries and the rest two from steel industry have been selected. These four organisations have been chosen only because data required to fit in the present analysis could be collected from them.

It can be seen by going through table 6.2 which follows how depreciation rates, cost of production and profitability of these four industrial enterprises were affected because of under-estimation of the useful lives of their machines. Initially estimated working life of machines in case of Daulatpur Jute Mills Ltd., Khulna was 14.29 years, but in case of each of the remaining three was 10 years. The commercial productions of the first, second, third and fourth organisations (as mentioned in the table) were started in July 1955, March 1967, May 1965 and January 1962 respectively (column 2 of table 6.2). So, in December 1980, they had already completed 25.50, 13.83, 15.67 and 19 years of service. Machines under study of each of the said organisations were found functioning efficiently even much after the expiry of their estimated useful lives. While consulted, mechanical engineers and mechanics who had been working for the repairs and maintenance of the machines since installation viewed that the machines of the enterprises as mentioned in the
Table 6.2: Effect of underestimation of useful lives of plant assets on depreciation (under straight-line method), cost of production and profitability

<table>
<thead>
<tr>
<th>Year of starting commercial production</th>
<th>No.of plant assets studied</th>
<th>Initially estimated life</th>
<th>Machine hours* lost due to * strikes, mechanical breakdown, power failure, non-availability of materials, political disturbances etc.</th>
<th>Total calculated life from the date of commissioning</th>
<th>Extent of underestimation of useful life (Excess of running life over total calculated life) to Dec. 1980</th>
<th>Original cost</th>
<th>Corporation rates based on total calculated life charged</th>
<th>Depreciation rates based on running life estimated (as per col. 6)</th>
<th>Rates at which depreciation over-charged</th>
<th>Effect on depreciation, cost and profitability (the amounts by which depreciation over-estimated and profit understated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Daulatpur Jute Mills Ltd., Khulna</td>
<td>250 looms</td>
<td>14.29</td>
<td>6150 hrs</td>
<td>15.57</td>
<td>25.50 9.93 15,03,550 7</td>
<td>6.42</td>
<td>3.92</td>
<td>2.50</td>
<td>2.50% of TK. 15,03,550 = 37,585.75</td>
<td></td>
</tr>
<tr>
<td>2 Karnaphuli Rayons and Chemicals Ltd., Chittagong</td>
<td>1 Casmatic chloric plant</td>
<td>10</td>
<td>12,960 hrs</td>
<td>11.80</td>
<td>13.83 2.03 52,76,621 10</td>
<td>8.47</td>
<td>7.23</td>
<td>1.24</td>
<td>1.24% of TK. 52,76,621 = 77,830.10</td>
<td></td>
</tr>
<tr>
<td>3 G.M. Steels Ltd., Chittagong</td>
<td>1 1st Finish mill AST 350 complete machine</td>
<td>8,447 hrs</td>
<td>15.52 15.87 2.15 2,40,000 10</td>
<td>7.40</td>
<td>6.38</td>
<td>1.02</td>
<td>1.02% of TK. 2,40,000 = 24480.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Mohammedi Iron and Steel Works Ltd., Chittagong</td>
<td>1 Electro tric Arc Furnace</td>
<td>45,320 hrs</td>
<td>16.29 19.00 2.71 7,01,039 10</td>
<td>6.14</td>
<td>5.26</td>
<td>0.88</td>
<td>0.88% of TK. 7,01,039 = 5,105.14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Machine hours were lost due to strikes, mechanical break-down, power failure, non-availability of materials, political disturbances etc.
** Total lives of machines have been calculated by considering last hours.
*** Yearly machine hours: Daulatpur Jute 4,850; Karnaphuli Rayon 7,200; G.M. Steels 2,400; Mohammedi Iron & Steel 7,200.
**** Here Corporation means 'Bangladesh Jute Mills Corporation', 'Bangladesh Chemical Industries Corporation' and 'Bangladesh Steel and Engineering Corporation'.
table would function efficiently for further periods of atleast
16, 10, 15 and 5 years respectively. The researcher, in consulta-
tion with the mechanical engineers of the industrial undertakings
concerned as well as ten professors of mechanical engineering
of Bangladesh Engineering University, Dacca, Jadavpur University,
Calcutta, Panjab University; Chemical Engineering and Technology
Department, Chandigarh and Panjab Engineering College, Chandigarh
came to learn that probable loss of machine hours because of
strikes, mechanical break-down, power failure, non-availability
of materials, political disturbances etc. could not normally be
assessed and considered by the manufacturers while the useful
lives of machines were estimated. So, for the purpose of
analysis in this context, hours lost owing to the aforesaid
reasons have been taken into account by adding them to the
initially estimated lives to ascertain total calculated lives
as shown in column 6 of table 6.2. It is revealing from column
8 of the same table the extent to which the working lives of
machines were under-estimated in each of the four cases. And
because of the under-estimation of useful lives of machines
in case of the organisations studied, the table indicates the
rates (2.50 %), 1.24 %, 1.02 % and 0.88 % shown in column
13 of the said table) at which depreciation was over-charged
because of under-estimation of useful lives of the studied
machines. And column 14 of the above table shows the amounts
by which depreciation was over-charged, cost of production
over-estimated and profit under-stated during the total estimated
(calculated ) lives of the respective machines on account of the
the under-estimation of their useful (working) lives.

Hence, the above study reveals that the under-estimation of the useful lives of the plant assets led to over-charging of depreciation thereby raising the cost of production leading, in turn, to the decline in profitability to the extent of TK. 1,24,035.99 (that is, total of the figures shown in column 14) over their total estimated lives.

6.4: An overview

It appears from tables 6.1 and 6.2 that in most of the enterprises under study in this context, the considered working lives of plant assets were under-estimated. The present analysis tends to indicate that the sector corporations in case of public sector undertakings and the industrialists in case of private sector undertakings did not care to give adequate thought nor did they use their past experience properly for estimating the useful lives of fixed assets. Regarding machines, it is apparent that they were mainly guided by the manufacturers’ specification. It is further evident that under-estimation of working lives led to overcharging of depreciation which, in turn, led to distortion in cost to the extent of its (cost) overstatement. However, what appears to be more important is that owing to under-estimation of the working lives of the machines studied, depreciation was overcharged which is undesirable. From the angle of "matching of cost and revenue"
principle, all costs including depreciation should be neither overcharged nor undercharged. Both overcharging and undercharging of depreciation finally resolve to one point that it does not reflect a true and fair view of the profit and loss account and balance sheet.

Finally, it may be stated that this limited area of case studies has sufficiently revealed the extent of adverse influence, depreciation based on under-estimated lives of fixed assets has on cost and profitability. On the basis of the above micro level study, it may be observed that a macro level study of estimated life and depreciation may show an enormous influence on the cost-profit nexus of Bangladesh economy, if undertaken for all fixed assets of all industrial enterprises.