

An Empirical Evidence on the Popularity and Consistency of Depreciation Methods Practiced in Bangladesh

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Depreciation is considered to be one of the most important accounting practices in a firm. That's why it became an area of research and concentration for the authors and researchers for many years. As a result there are many researches, journals and articles are found on depreciation techniques, calculation methods and their implications. However, very few scholars have conducted their research on depreciation methods practiced by the Bangladeshi companies. This research paper is an attempt to document the current depreciation practices in Bangladesh. Although there are different methods of depreciation exist, most of the companies in the Dhaka Stock Exchange (DSE) practice either straight line or reducing balance method of depreciation. It is revealed by the research that reducing balance method of depreciation is widely practiced in most of the companies enlisted in DSE followed by the straight line method. Very few companies practice both the methods in depreciation calculation of different assets. It is also observed from the research that the companies are very consistent in practicing depreciation methods.

Field of Research: Financial Accounting, Accounting Education.

Keywords: Depreciation, Reducing balance method, Straight-line depreciation, Dhaka Stock Exchange (DSE), Consistency

1. Introduction

'Fixed assets or property, plant and equipment along with intangible assets make up the long lived assets acquired by a company to use in the operation of the business which is not intended for resale' (Meigs & Meigs 1987, p. 418). Epstein and Mirza (2003, p. 261) suggests that 'the services and economic benefits provided by these assets is usually for a period higher than that covered by a year's financial statement and hence the cost of the asset needs to be capitalized and has to be allocated over the period during which these benefits will be received'. Hence 'the accounting system that targets to allocate the cost less residual value (estimated amount expected to be obtained at the end of the useful life of the asset) of any tangible assets over the expected useful life in a systematic manner is known as depreciation' (Kay et al. 1989, p. 15).

Depreciation therefore for a particular year is the portion of the total cost that is to be allocated for that year. It is a non cash expense charged in the income statement in accordance with one of the most important accounting principles - matching principle. The matching principle states that expenses must be matched with

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revenues. 'Depreciation is a method of cost allocation and not asset valuation hence it does not take into account any changes in the market value' (Epstein & Mirza 2003, p. 268, Meigs et al. 2001, p.342).

Accumulated depreciation is a contra asset account which appears in the balance sheet of a company. It is the total depreciation which has been exhausted in the prior periods. Book value of an asset is calculated by subtracting the accumulated depreciation from the historical cost, which means it is the portion of asset yet to be depreciated. Thus,

$$\text{Book Value of a Fixed Asset} = \text{Cost} - \text{Accumulated Depreciation}$$

Weygandt, Kieso and Kimmel (2007, p. 406) suggested that 'the main causes of depreciation are physical deterioration (results from use of the asset and climatic condition) and obsolescence (process of becoming out of date)'. There are several methods of depreciation; however, according to International Accounting Standard (IAS) 16 (revised in 1998), whatever method is used the major issues are timing of recognition of asset, determination of carrying amounts and the depreciation charges and impairment losses to be recognized in relation to them (Deloitte Global Services Limited n.d.).

Depreciation is one of the most important terms and concepts in Financial Accounting and it has been of great interest to the authors and researchers for decades. However, very few researches have been conducted on depreciation methods practiced by Bangladeshi companies. Hence this study was conducted to cover the research gap while documenting the most popular depreciation method practiced by the Dhaka Stock Exchange (DSE) enlisted companies in Bangladesh.

Therefore, on that notion of the problem statement, the main objectives of this research are as follows:

- I) To document the most widely practiced depreciation method followed by the DSE enlisted companies in Bangladesh.
- II) To identify whether there has been any trend of shifting observed from one depreciation method to other.
- III) To evaluate whether an entity can be considered to be consistent in its use of accounting standards, i.e. consistency in applying the depreciation methods
- IV) To add significant knowledge to the research previously conducted.

The rest of the paper has been organized into five sections. The next section reviews the research articles that study the principles and theories of depreciation, different depreciation methods and their practices in Bangladesh. Section three and four present methods applied in this study and analysis of research findings respectively. Section five tests the "consistency" in applying the depreciation methods. A hypothesis has been developed in this section as well. At the end, section six draws the conclusion.

2. Literature Review

International level of accounting standards is practiced by businesses in Bangladesh. The Institute of Chartered Accountants of Bangladesh (ICAB) produced a manual regarding the accounting practices in Bangladesh, named as “Bangladesh Accounting Standards” (BAS) in compliance with the IAS with little adjustments. According to ICAB, all laws regarding depreciatoin in Bangladesh are described under BAS 16 ‘Property, Plant and Equipment’ (adopted after january 2007) which supersedes IAS 16 ‘Property, Plant and Equipment’ (ICAB 2007). The major issues that the BAS 16 states about depreciation is that if the cost of each part of an item of property, plant and equipment is significant to the total cost then it must be depreciated seperately and it has to be recognised in the income statement each period unless included in the carrying amount of an asset. The depreciable amount of an asset should be systematically distributed over its useful life, the salvage value and estimated useful life should be reviewed periodically to ensure that these do not differ from the previous estimated value. If there is any change then it shall be accounted for accordingly (ICAB 2008, pp. 311-313). These four points mentioned are in accordance with BAS 16.36, 16.43, 16.50 and 16.51. Besides, there are fourteen more points about depreciation that the BAS requires firms to comply with when computing the depreciation. According to the BAS manual, the ICAB requires firms to use those depreciation method that will reflect the actual pattern in which the future benefits provided by the asset are expected to be consumed by the organization, and the depreciation method should be reviewed at the end of at least each year to check whether there is any change in the pattern of consumption of benefit provided by the asset. If any such change is discovered then the depreciation method should be changed accordingly (ICAB 2008, pp. 314-315).

There are several methods for calculating depreciation:

1. Straight-line depreciation method
2. Declining-balance/Double Declining/Reducing Balance/Diminishing Balance method
3. Units-of-activity method
4. Sum-of-years' digits method

The methods selected is a judgemental matter but conceptually one should select a method that most closely approximate the actual pattern of use of the asset so that the cost allocation is appropriate. Stice, Stice, and Skousen (2004, p. 786) illustrated that ‘the methods available are time factor and use factor method. Time factor can be further divided into straight line depreciation and accelarated method which includes reducing balance method and sum-of-the years’ digit method. On the other hand, the use factor method includes service hours and productive units of output as depreciation methods’. There are three main variables that effect the computation of depreciation:

- 1. Cost-** Assets are recorded at cost, in accordance with the historical cost principle.
- 2. Useful life-**It is an approximation of the projected productive life, or the service life of the asset. Mostly expressed as the number of years the asset will be in use, or in units of activity, such as, hours, mileage or as units of output.

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3. Salvage value-Salvage value is an estimate of the asset's value at the end of its useful life.

Straight line method charges depreciation evenly each year over the useful life and is calculated by dividing cost less residual value (also known as the depreciable base) by the number of useful life. Sum-of-the years' digits and reducing balance methods both charge higher depreciation in the earlier years of assets and produce lower amount of depreciation at the later part of an asset's estimated useful life. According to the sum-of-the-years' digits method, depreciation is calculated by dividing the depreciable base by the number of years remaining by sum of the years digit. On the other hand, in the reducing balance method, depreciation is estimated by applying a constant rate to the book value of the asset (Skousen, Albrecht, & Langenderfer 1994, Kay & Searfoss 1989). The use factor method charges depreciation on the basis of the use of the asset or the output provided by it.

'Intangible assets are rights, privileges, and competitive advantages that result from the ownership of long-lived assets that do not possess physical substance' (Weygandt, Kieso & Kimmel 2007, p. 418). Examples of intangibles are goodwill, copyright, registered trademark, patent, franchise etc. Intangible assets are amortized over their useful life while natural resources which include oil, gas, coal, minerals etc. are generally depleted. However, the ultimate goal of depreciation, amortization and depletion is the same, i.e. to allocate the cost of an asset over its useful life.

The methods of depreciation those are usually followed in Bangladesh according to BAS manual of 16.62 are the straight line method, reducing balance method and units of production method (ICAB 2008). Ather, Sobhani and Chowdhury (2008, pp. 12-13) discussed in their research that 'most companies enlisted in Chittagong stock exchange (CSE) follow the British recording system in Accounting where the Reducing Balance Method of depreciation calculation is mostly used. On the other hand, Straight-Line depreciation Method is mostly used in the American recording system'. Their research outcome also holds globally, as a research conducted on the use of depreciation methods in 600 large U.S. companies (who uses the American recording system) reveals that 82% companies follow the straight line methods of depreciation while there were only 4% companies follow the reducing balance method and the remaining 14% of the companies follow the other different methods of depreciation (Keiso, Waygandt & Warfield 2008). The authors reached into the conclusion that around 75% of the CSE enlisted companies used reducing balance method and only 25% used straightline while in 18% cases companies used both. So they concluded that reducing balance method was more popular in Bangladesh.

It is revealed by various surveys that users highly value consistency (Keiso, Waygandt & Warfield 2008, p.33). The authors also suggested that 'an entity should apply the same accounting treatment to similar events and from period to period, which is referred to as consistency'. A change tends to destroy the comparability of data before and after the change. Inconsistency brings inability to analyze data over time. However, it does not really mean that the companies cannot make change. They can definitely change methods; however, the change should be properly justified and elaborately explained to the shareholders. Some companies assist

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users to understand the pre and post change data as well. So, from an entity's point of view, consistency in applying various accounting standards is very crucial.

3. Research Methodology

The research is based on the secondary data. These data were collected from the annual reports of respective companies. In order to follow the "Full Disclosure Principle" the companies are required to describe in detail regarding their depreciation techniques along with other necessary information. The 'Notes to the Financial Statements' section in the annual report of these companies disclose the methods of depreciation followed by them. All the enlisted companies in the Dhaka Stock Exchange (DSE) are categorized into 22 different industries. Out of which 16 different industries have been selected. Travel & Leisure, Treasury Bonds, Corporate Bonds, Debentures, and Mutual funds are excluded from the sample. A total number of 135 DSE enlisted companies have been selected on random sampling method and their annual reports for the year ended 2009 have been studied to identify the depreciation techniques they follow. Furthermore, in order to justify the entity's consistency in applying the depreciation techniques, annual reports of these companies have been studied for the period of nine years beginning from 2001 to 2009. The following table on the next page discloses the list of observed companies:

Table 1: Listing of researched companies

	Name of Industry	Total Companies	Researched companies	% of the Population (rounded)
1	Cement Industry	5	5	100%
2	Food and Allied Industry	13	7	54
3	Textile Industry	22	19	86
4	Pharmaceuticals & Chemicals	19	14	74
5	Tannery	4	4	100
6	Ceramic	5	5	100
7	Telecommunication	1	1	100
8	Jute & Paper	3	3	100
9	Engineering	21	13	62
10	Service & Real estate	4	3	75
11	Banks	30	23	77
12	Insurance	44	13	29.5
13	IT Sector	5	4	80
14	Fuel and Power	11	10	91
15	Miscellaneous	9	7	78
16	Financial Institutions	21	4	19
	Total	217	135	62%

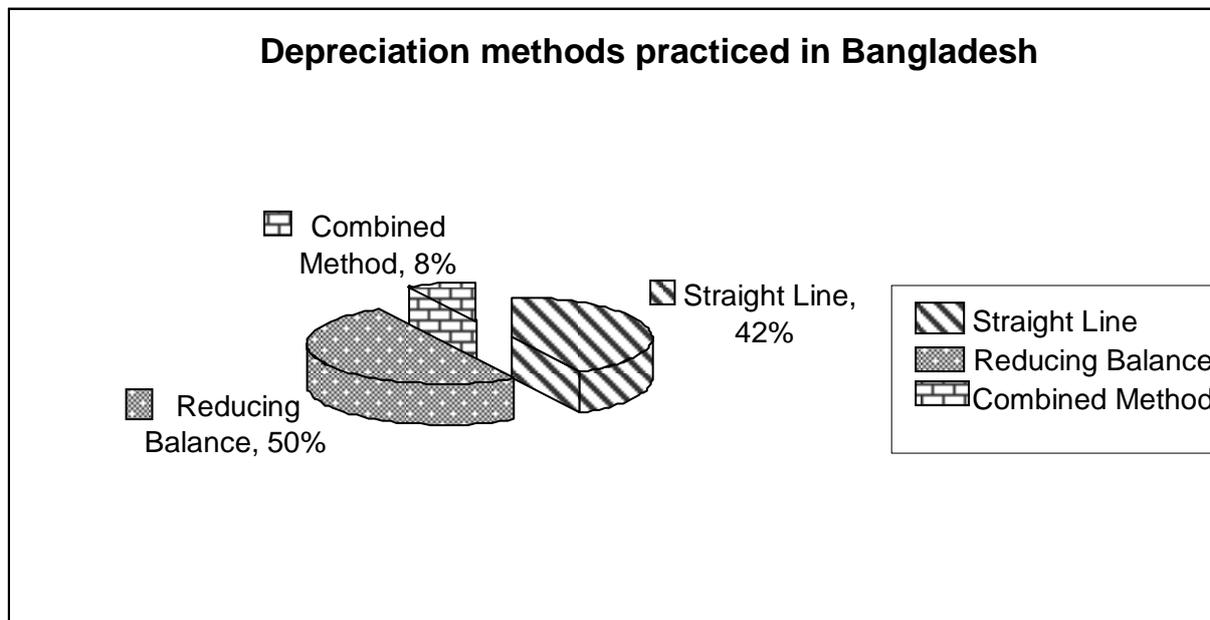
4. Analysis and Research Findings

As mentioned earlier, a total of 135 DSE enlisted companies' annual reports have been reviewed in this research. It is revealed by the research that out of total 135 surveyed companies, 68 companies (50%) use only the Reducing Balance Method of depreciation for their property, plant and equipment, 57 companies (42%) apply

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only the Straight-Line Method of depreciation calculation for their fixed assets while the remaining 10 companies (8%) follow both the methods in depreciation calculation of different assets of their companies. A graphical presentation of the research findings is presented on the following page:

Figure 1: Depreciation methods practiced in Bangladesh



In addition, the following table discloses the industry-wise breakdown of depreciation method practices in Bangladesh.

Table 2: Industry-wise breakdown of depreciation practices in Bangladesh

	Name of Industry	Straight Line Method	Reducing Balance Method	Both Methods
1	Cement Industry	4	1	
2	Food and Allied Industry	0	7	
3	Textile Industry	8	11	
4	Pharmaceuticals & Chemicals	7	7	
5	Tannery	1	3	
6	Ceramic	0	5	
7	Telecommunication	0	1	
8	Jute & Paper	1	2	
9	Engineering	5	8	
10	Service & Real estate	0	3	
11	Banks	10	4	9
12	Insurance	6	7	
13	IT Sector	1	3	
14	Fuel and Power	9	1	
15	Miscellaneous	2	4	1
16	Financial Institutions	3	1	
	TOTAL	57	68	10

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Therefore it is proved by the research that the reducing balance method is still a preferred method of depreciation calculation among the DSE enlisted companies in Bangladesh.

There are many reasons as to why companies choose accelerated method. Meigs et al. (2001, p.348) emphasized that, 'since it results in higher depreciation in the earlier life of the asset it affects the amount of tax to be paid because it reduces the taxable income and thus increases the availability of cash'. 'The other advantage it has over straight line method is that the depreciation and maintenance cost together tends to equalize over the period' (Stice, Stice & Skousen 2004, p.790). Moreover, Keiso, Waygandt and Warfeild (2008, p.524) believe that 'it is reasonable to use accelerated approach since it assumes that during the early life of the asset it suffers the most and its service providing ability declines as it grows old, hence the method charges higher depreciation during the early periods and gradually the depreciation expense becomes lower during the later period because of high maintenance cost'. Since it has higher advantage over straight line method and is more reasonable, probably that's why more companies tend to practice it till today.

On the other hand, companies might choose to use the straight line method because it is simple, easily understood and Supported by International Accounting Standards (IAS). Stice, Stice and Skousen (2004, p.789) pointed out that 'Under normal situations like when asset accumulate so that the total depreciation and maintenance cost remains constant for each year and the service potentials equally and steadily reduces through performance along with physical wear and tear, straight line method offers a satisfactory basis of distributing the cost'. Meigs et al. (2001, p.348) claimed that, 'this method reports a lower depreciation compared to the accelerated method hence it results in higher net income which is very lucrative to the company's stockholders, thus companies tend to use this method of depreciation in their financial statement'.

The other side of the coin suggests some problems, such as, misrepresentation of the Return on Asset (income/assets) ratio, which might lead to a wrong analysis of it. As asset book value decreases the rate of return increases, then the combined charges of depreciation and maintenance increase over the asset's life. Moreover, 'net income is highly sensitive to the volume of business activity under straight line depreciation' (Keiso, Waygandt & Warfield 2008, p.524, Stice, Stice & Skousen 2004, pp. 789-790). In addition, straight line depreciation method is based on two unrealistic concepts that the benefits to be received from the asset will be same each period and it expects the maintenance and repair cost to be constant over time.

5. Consistency Testing

"Consistency" means that a company uses the same accounting principles and methods from year to year. For example, if a firm uses "FIFO" as the inventory costing method, it is expected to use the same method in succeeding years. To fulfill the research objective, the following hypothesis is developed for the consistency testing.

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H_0 = The companies are not consistent in applying the depreciation methods.

H_1 = The companies are consistent in applying the depreciation methods.

In the light of the definition, a research has been carried out on the same one hundred and thirty five companies. It is revealed by the study that, out of total 135 researched companies, only six companies have changed their depreciation techniques at least once over the period of last nine years (2001 – 2009). It means that, only around 4.5% of the total researched companies are found to be inconsistent over the period of nine years. Since the percentage of inconsistency is significantly lower, the null hypothesis can be rejected and it can be asserted that the DSE enlisted companies are consistent in applying the depreciation methods.

6. Conclusion

Depreciable asset is a significant part of all asset of many enterprises, which are used to generate revenue for the organisation. Hence depreciation can have a strong effect in determining the financial position and result of operation in those organizations. Thus it is very important for companies to choose the correct method of depreciation and generate the near to exact amount in compliance with all the accounting principles and assumptions. Hence the International Accounting Standards include many rules and issues about depreciation that are to be followed by all organisations. Similarly in Bangladesh the ICAB has created its own manual in compliance with IAS for depreciation method. However slight modifications are done by ICAB from the context of Bangladesh. One major problem is that the IAS updates its rules and policies almost every year to maintain the standard in accordance with the changing business environment but the BAS manual is hardly updated to maintain the similarity.

The BAS confirms many depreciation methods that can be adopted in Bangladesh which are included in the IAS. This research shows that the most popular method of depreciation in Bangladesh is the reducing balance method as compared to the straight line method. However there are companies that use a combination of both the methods. Some earlier researchers concluded that even though more companies in Bangladesh use the reducing balance method, the trend is moving towards the straight line method. However no such issue has been noticed as 95.5% companies tend to be consistent enough in applying the depreciation methods over the period of nine years from 2001 till 2009.

Selecting the type of depreciation to be used is a subjective issue and hence it depends on the firm and its policies. However whatever method is chosen it has to comply with either the BAS16 or the IAS16. Regardless of which method is used depreciation is basically an estimate and may require customization as new information becomes available. Finally it is important to depreciate assets to provide investors and other users of financial statements with the true worth of assets and to show what portion of its benefits has been used by the firm. Then and only then the objective and purpose of depreciation methods in financial accounting will be properly justified.

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The results would be more reliable if number of observations can be increased. But absence of established and updated databases in Bangladesh makes data collection fairly difficult and time consuming. The study focused only on the Dhaka Stock Exchange (DSE) enlisted companies in Bangladesh. Further scopes are there to do similar studies by adding observations and variables, for example, comparative study can be executed with Chittagong Stock Exchange (CSE) enlisted companies or with a group of developing countries which may provide more confident result instead of focusing on one country.

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