THE INFLUENCE OF DEPRECIATION POLICIES ON FINANCIAL STATEMENT ANALYSIS: A CASE STUDY OF AIRLINE INDUSTRY

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Abstract. The public and professionals are gradually taking the quality of financial statement of airline' companies into account since the global airline industry plays a vital role within the international business community. However, methods of airline financial reporting and disclosure vary significantly from country to country due to different accounting standards. This disparity in accounting disclosure represents a large obstacle to the growing globalization of business as international investors need comparable financial information to assess the financial health of different companies. This paper will illustrate one of issues observed in the airline industry called the estimation of depreciation expenses, which exerts a huge influence on the stated revenue since depreciation is a major expense in the industry. Assisted by classical financial analysis, we find that companies can perform different depreciation estimation practices which are allowed by different accounting practices to manage earnings.

Keywords: financial statement, depreciation policies, airline industry, estimation, ratio.

Jel classification: M41

1. Introduction

The airline industry has faced complex regulations and divergent accounting standards (KPMG 2005). This situation has raised concern that firms can abuse the discretion that different accounting standards allow (Holland, Ramsay 2003). Firms reveal information through their accounting policies and invertors regard financial statement as the most important source of information for investmet decisions (Chang, Most 1981). For investors, the profitability is the pivotal factor for assessment. In the meantime investors must assess the quality of profitability to ensure the comparability of information (Best). Chong and his colleagues (2000) assert that variations caused by an industry factor should be eliminated, or at least reduced, thus, it requires more analysis. The International Accounting Standards Committee [IASC] (2000) and Choi *et al*. (1984) stated that the worldwide disparity in accounting practices is a large impediment to the growing trend in the internationalization of corporate activities and the growing globalization of business and capital markets. Harmonization of accounting policies between airlines enables greater comparability for stakeholders when reviewing the paper of different airline (KPMG 2005). However, accounting policies are influenced by a good number of factors, such as the governmental regulation, economic and political factors as well as cultures, and customs (Philips *et al*. 2004). To some extent, it is difficult to ensure that every related field is satified about the result, which leads to a trade-off in relevance, reliability, comparability, timeliness and completeness. Since a growing number of professionals realize the importance of the financial reporting quality, the convergence of financial disclosure method is demanded (Purvis, Gernon, Diamond 1991). In the airline industry, depreciation is a major expense. Although depreciation is not a cash item, it influences stated profitability and asset values in the balance sheet, tax, and stock price of a company (Tarry 2010), so managers have the incentive to do earnings management by changing depreciation policies (Mohrman 2009). Theoretically, the depreciation expense of airline is computed by estimating both the useful life and residual value (Depreciation = (Asset Value – Residual Value) / Asset Life). Thus the depreciation expenses are subjected to managers' estimation errors and sometimes this estimation error represents part of the managers' strategies to manipulate earnings. It is found that some companies achieved earnings boost by increasing the residual values and extending the estimated depreciable lives of its aircraft and consequently obtain an increase in its share prices (CFRA 1999). For example, Mohrman (2009) has studied a com-

pany called Delta Air Lines, Inc. ("DAL") – DAL extended the life of certain aircraft on July 1, 1998 to 25 years from 20 years and changed its residual values from 5% to 5% to 10% of its cost. This change not only reduced depreciation expense by $92 million but also increased its earnings of $0.37. While the present profit was increased by reducing the depreciation expense, future profits will be adversely influenced because of higher aircraft value stated in the balance sheet (KPMG 2005; Mohrman 2009). This accounting treatment obtains unsustainable earnings, as often referred to poor-quality earnings (Penman, Zhang 2002). Additionally, it could lead to a series of change in financial ratios, which will misguide investors' analysis. The target and objectives in this paper is to provide an understanding of airline in depreciation by depreciation rate comparation (Morrell 2007). Thus, many experts on the quality of earnings turn their eyes to the effects of changes in accounting estimates (Healy 1985; Wahlen 1999). This paper focuses attention on the impact of depreciation expense estimations in the airline industry because of the challenge they pose on analysis of finanaical statements. We have surveyed the 2010 public financial regulatory filings (10-Ks) of two famous companies: Delta Airline and China Southern Airline Company. We first explain financial analytical tools and their usage, and then jointly discuss depreciation estimation diversities and their impact on the financial statements and consequently financial analysis.

2. The analytical model and data

In this paper, we will cite the information from the publically disclosed documents as evidence. The typical document is an annual paper of a company. To better assess the information, some classical analytical tools will be used, such as ratio analysis. In analyzing impact of different deprecation policies of the two airlines, three parts will be assessed successively: return of investment, operating performance, and market measure. Assisted with certain financial ratios, every part will be carefully studied.

2.1. Financial ratios

It is necessary to examine and evaluate the efficiency of the company with financial ratios (Keeler 1972). In this part, some classical financial ratios (seen in Table 1.) will be discussed to explain the impact on the airline industry while the depreciation expense change occurs. Because of the differences in the accounting policies, investors and the publics find it difficult to make the comparative financial

reviews between the different airlines (KPMG and IATA 1992). Depreciation is one of the important accounting items in the airline company's financial statement. Divergent interpretations of accounting standards, along with different airline fact patterns, will result in difference in the application of financial statements. According to Tan *et al.* (2002), "Asian airline adopted relatively conservative depreciation policies that charged double the annual depreciation rate of the European or North American airline even though their fleets were generally younger" Even in the same countries, some airline use straight-line methods, while others use double-decline depreciation or units of output depreciation methods. These differences will lead to the different effective depreciation rates. Consecutively, theses different depreciation rates will influence the financial analysis (Drake 1998).

Table 1. Ratios used in financial analysis

Financial Ratio	Numerator	Denominator
Net Profit Margin [1]	Net Income	Sales
Operating Profit margin [2]	Income From Operations	Sales
Price-to-book ratio [3]	Market Price per share	Book value per share
Price-to-earnings [4]	Market price per share	Earnings per share
Earnings Yield [5]	Earnings per share	Market Price per share
ROE [6]	Net Income	Average Shareholder Equity
ROA [7]	Net Income	Average Total Asset
Earnings Per Share [8]	Net Income – dividends on preferred stock, if any	Average Common shares outstanding

1. The main purpose for net profit margin is to reflect the effectiveness of cost control for banks (Subramanyam, Wild 2008).

2. Operating Profit margin assesses profit margins from operating activities (Subramanyam, Wild 2008).

3. Price-to-book ratio illustrates how the stocks market value is compared with its book value, which is also called price-to-equity ratio. It usually varies by different industries. However, it may mean the company dose not work very well, if the P/B ratio is too low (Subramanyam, Wild 2008).

4. Price-earnings ratio assesses how confident the public is in the ability of the company to increase their revenues (Subramanyam, Wild 2008).

5. The earings yield has shown the percentage of dollar, which was earned by the corporations and invested in the stock. It is used to judge whether the asset is well allocated or not. It is also the reciprocal of the price-to-earnings ratio (Subramanyam, Wild 2008).

6. Return on stockholder's equity measures the effective use of resources provided by stockholders. This measure of performance is one of the key profitability indexes (Subramanyam, Wild 2008).

7. Return on asset measures the bank's ability to operate its funds for making profits, which is dynamicly integrated by the related information from balance sheet and income statement (Subramanyam, Wild 2008).

8. The most popular profitability ratio is Earnings per Share (EPS). This is one of the easiest ratios to use when comparing companies because many firms include this ratio on their income statement. EPS gives a picture of the current net income in a particular period to the number of outstanding shares of stock (Subramanyam, Wild 2008).

Each of them has reflected an important meaning and information of the degree of the operation of company. It also serves as a significant signal for the investors to monitor the development of the corporations. Additionally, all of them are closely related.

2.2. The data

The data is cited from the 2010 public financial regulatory filings of the selected companies. It contains the financial statements, management discussion and analysis, chairman's statement, and corporate information etc. In this study we focus on financial statement related to depreciation issues. We would like to illustrate the difference in estimating the useful life between two corporations, Delta Airline and China Southern Airline Company respectively, while the specifications of their aircrafts are similar.

Table 2. Estimated residual lives of items of property, plant and equipment of Delta Airline

Asset Classification	Estimated useful life
Flight equipment	21-30 years
Capitalized software	3-7 years
Ground property and equipment	3-40 years
Leasehold improvements	Shorter of lease term or estimated useful life
Flight equipment under capital lease	Shorter of lease term or estimated useful life

Notes: 1. We capitalize certain internal and external costs incurred to develop and implement software. For the years ended December 31, 2010, 2009 and 2008, we recorded $71 million, $95 million and $99 million, respectively, for amortization of capitalized software. The net book value of these assets totaled $153 million and $126 million at December 31, 2010 and 2009, respectively.

2. For the leasehold improvements of certain airport facilities, we apply estimated useful lives which extend beyond the contractual lease terms. We record property

and equipment at cost and depreciate or amortize these assets on a straight-line basis to their estimated residual values over their estimated useful lives. Residual values for owned spare parts and simulators are generally 5% of cost except when guaranteed by a third party for a different amount.
Source: Based on Delta Airline. 2010. The Corporate Report

Table 3. Estimated residual lives of items of property, plant and equipment of China Southern Airline Company

Asset Classification	Estimated useful life
Buildings	30-35 years
Owned and leased aircraft	15-20 years
Other flight equipment	
-Jet engines	15-20 years
-Others, including rotable spares	3-15 years
Machinery and equipment	4-10 years
Vehicles	6-8 years

Note 1: Property, plant and equipment are depreciated on a straight-line basis over the estimated useful lives, after taking into account the estimated residual value. The Group reviews the estimated useful lives of assets regularly in order to determine the amount of depreciation expense to be recorded during any reporting period. The useful lives are based on the Group's historical experience with similar assets and anticipated technological changes. The depreciation expense for future periods is adjusted if there are significant changes from previous estimates. Depreciation is calculated to write off the cost of the items of property, plant and equipment, less their estimated residual value, if any, using the straight line method over their estimated useful lives. Where parts of the property, plant and equipments have different useful lives, the cost of the item is allocated on a reasonable basis between the parts and each part is depreciated separately. Both the usefull life of an asset and its residual value, if any, are reviewed annually. (Source: Based on China Southern Airline Company. 2010. The Corporate Report)

Note 2: China Southern Airline Company's operating fleet at December 31, 2010. Untill 31 December 2010; the Group had a fleet of 422 aircraft, consisting primarily of Boeing 737 series, 747, 757, 777, Airbus 320, 300, and 330 series, etc. The average age of the group's registered aircraft was 6.36 years at the year end of 2010. (Source: Based on China Southern Airline Company. 2010. The Corporate Report).

**Table 4**. Delta Airline's operating fleet on December 31, 2010

| Aircraft type | Current fleet | | | | Average Age |
| | Capital | | Operating | | |
	Owned	Lease	Lease	Total	
Passenger Aircraft					
B-737-700	10			10	1.9
B-737-800	73			73	9.9
B-747-400	4	9	3	16	17.1
B-757-200	90	40	34	164	17.9
B-757-300	16			16	7.8
B-767-300	9		5	14	19.7
B-767-300ER	49	2	6	57	14.7
B-767-400ER	21			21	9.8
B-777-200ER	8			8	10.9
B-777-200LR	10			10	1.8
A-319-100	55		2	57	8.9
A-320-200	41		28	69	15.8
A-330-200	11			11	5.8
A-330-300	21			21	5.4
MD-88	66	49	2	117	20.5
MD-90	19			19	14.9
DC-9	39			39	34.1
CRJ-100	21	13	23	57	12.9
CRJ-200			8	8	12.6
CRJ-700	15			15	7.1
CRJ-900	13			13	3.1
Total	591	113	111	815	15.1

Based on Delta Airline. 2010. The Corporate Report

3. Results and discussions

It is obvious that depreciation is demonstrated as the expense contains several methods such as the straight-line method as well as accelerated method, hence the flight needs to decrease its value (Samula, Mistro 2004). According to Table 2, Delta Airline records property and equipment at cost and depreciates or amortizes these assets on a straight-line basis to their estimated residual values over their respectively estimated useful lives. The straight-line method of depresication allocates the cost of an asset to its useful life on the basis of equal periodical changes. Residual values for flight equipment account for 5 percent of cost. The estimated useful lives for flight equipment are 21-30 years. From Table 3, China Southern Airline Company also states its property and equipment at historical cost, and depreciates and amortizes these assets on a straight-line basis. Compared with Delta Airline, China Southern Airline Company is relatively conservative as the lower useful life, which is based on the principle of "anticipate no profit, but anticipate all losses" (Watts 2002). Alt-hough the average ages of China Southern Airline Company's aircrafts are very young – average 6.36 at the end of 2010, the company's estimated useful lives of aircrafts are much shorter than those of delta airline. The estimated useful lives for flight equipments are 15- 20 years. For the purpose of simplification, this camparation is assumed that aircraft types of the two companies are similar. Based on the information collected (Fig. 1 and Table 4.), we think that aircraft types of the two campanies are similar. According to the computation of depreciation expenses: Depreciation = (Asset Value – Residual Value) / Asset Life. Delta Airline' longer estimated asset life makes the depreciation expense lower, and thus the company achieves a higher net income than China Southern Airline Company. Therefore, investors should investigate the real utilization and efficiency of the cost structures, which may influence the fluctuation in the capital stock (Oun, Zhang 1991). There is a tendency to view a high income as a sign of good operating performance. If the investors wrongly attribute this income raise to the company's good performance, the stock price of will increase because of different estimation. Investors, as with higher levels of management, are all likely to look at the surface profitability ratios as the standards to judge their performance (Tamari 1978).
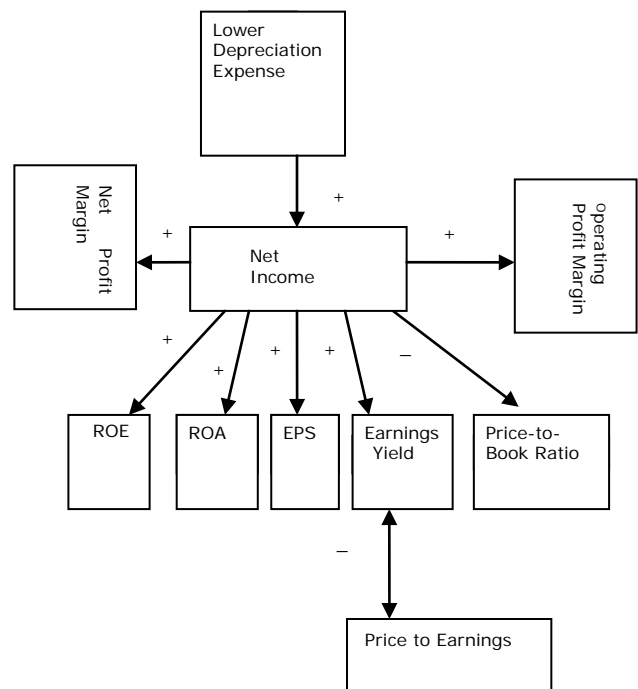
Fig.1. Key elements of financial statement analysis

Obviously, the changes in the costs of airline can be decomposed into some components and separately measured to identify the effects and quality of the company (John, Paul 2007). Although the estimation of the residual value and useful life is stable, it is so important that it could determine effective depreciation rates. Sometimes, it is affected by the various stages of the airline industry such as regulation, liberalization and re-regulation (Wensveen 2010). Also it is the key to financial analysis as it influences the "periodical profitability as well as the comparability of business for a long time" (KPMG 2005). Since the Delta Airline's turnover and stock price are relatively higher than those of China Southern Airline, the former will enjoy a relative advantageous competitive place in the airline industry. To be specific, because of the change in their revenues and stock prices, it reflects the ability of that company to manage business by the variation of return of investment, operating performance, and market measure. For example, the ROA and ROE have been improved by the increase of income, which means the ability of the company to make profit has improved in this period and the effective allocation of resources by the managers (Drake 1998). Likewise, the operating profit margin (pretax) and net profit margin have the same reaction. When the revenue and the net income are higher, the results are better, which reflects the performance of the corporation as a whole. In addition, both of the Price-to-earnings and Price-to-book increase when the market price goes up as compared with the Earnings yield. Specifically, the Price-to-earnings gives a picture of the confidence and expectations of the publics, which believe the company could increase their investments. In the same time, the price-to-earnings is the vise of the Earnings yield. Meanwhile, the higher of the price-to-book, the higher risk the investors face. These factors have helped the corporations to be competitive and efficiency in both quantitives and qualitatives (Miller 1994).

4. Conclusion

In this paper, we first exam the several factors influencing the effective depreciation rate, which are residual value and useful life. In addition, we also illustrate how these factors affect the financial analysis by using two airline companies as examples. While the evidence of business demonstrates numberous uncertainties which arise from estimation errors, our analysis requires scrutiny of such special charges. Accounting standards for impairments of long-term assets demand companies to periodically make revisions in case of possible impairments. In reality, however, companies can still defer the recognition of impairments when managers relize the need to impair. If so, the follow-up write-down can distort the truth. The financial analysis in this paper demonstrates that if the estimated useful lives of assets with fixed residual values are prolonged, the depreciation expenses for the period would be lower. Therefore, the higher stated income will contribute to higher periodical profitability in the financial analysis as well as higher market price, and investors and the public would wrongly believe the corporation operates very well. However, the consequence from the financial report may not reflect the factual operation of the company. Thus when analyzing the financial statement; investors pore over the statistitcs to rule out the distorting factors to ensure the comparability of information.

A further implication of this paper is that efforts of improving the comparability of airline financial reporting are necessary to facilitate globalizaiton of airline business as well as the worldwide economic growth. Since the business environment is becoming increasingly international; the use of accounting information across national boundaries exerts a pressure for comparable information (Taylor & Turley, 1986; Tower, Hancock & Taplin, 2002). In the current situation, when interpreting the profit of companies for comparative analysis, we need to direct our attention to potential distortions arising from accounting methods. Even though this is applicable to all cost analysis, it is especially important with depreciaton accounting. This item merits special attention because they represent costs that are usually substantial in amount and subject to alternative acoounting menthods that can markedly affect their measurement. International organizations should coordinate to harmonize accounting within the industry instead of subverting various national accounting practices. After all, the motivation for harmonization is the desire to improve comparablity between international companies and to facilitate economic decision making process for investors.

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