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A NOTE CAUTIONING AGAINST FINANCIAL ANALYSTS' HIGH RELIANCE ON PROFITABILITY DATA: THE CASE OF THE PHARMACEUTICAL AND CONSTRUCTION SECTORS IN THE UK

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ABSTRACT

In this paper, the author puts forward several issues that need to be considered before a financial analyst can rely on profitability data when making inferences about a company's value. Two issues are addressed namely, the accrual accounting method and earnings management. In order to illustrate the issues, the author used the Ohlson's model (1991) which argued that the value of a firm is the sum of the book value of the equity and the present value of the expected future clean surplus residual income. To facilitate the illustration, the author selected two UK companies from the pharmaceutical sector and two UK companies from the construction sector. The two sectors were selected because they were affected differently by the application of the accrual accounting method. Generally, our evidence from the financial data supported intuitively Ohlson's model. In addition to using Ohlson's model, the author also discusses the issue of earnings management which potentially affects the usefulness of profitability data.

ABSTRAK

Dalam kertas kajian ini, penulis mengetengahkan beberapa isu yang perlu diambil kira sebelum seseorang penganalisis kewangan boleh bersandar kepada data keberuntungan untuk tujuan menentukan nilai sesebuah syarikat. Dua isu yang diberi tumpuan dalam kertas ini, iaitu prinsip akruan dalam menyediakan akaun-akaun dan memanipulasikan data berkaitan dengan untung syarikat. Bagi tujuan ilustrasi, penulis menggunakan model yang telah diperkenalkan oleh Ohlson (1991) yang mencadangkan bahawa nilai sesebuah syarikat adalah merupakan gabungan

kepada nilai buku ekuiti dan nilai masa kini lebihan residu pendapatan masa hadapan dijangka. Dua syarikat yang beroperasi di UK daripada dua sektor yang berbeza iaitu pembinaan dan farmasi, telah digunakan untuk tujuan ilustrasi model Ohlson. Penemuan daripada dua syarikat di atas secara umum menyokong model Ohlson.

BACKGROUND

In his paper, Ohlson (1991) suggested that the price of a company's security was the sum of the book value of equity capital and the present value of expected future clean surplus residual income. In building the model, three important assumptions were made:

i) the present value of the expected dividends is the determinant of the market value;
ii) the clean surplus relation of earnings holds; and
iii) the stochastic time-series behaviour of abnormal earnings prevails.

According to the model, assuming the clean surplus relation held, the difference between the observed market value of equity and its current book value was the present value of future abnormal earnings (i.e. goodwill or superprofits). These abnormal earnings were expected to persist in the future. The reason for the existence of persistent abnormal earnings was due to a lag in recognising expected future profits in accounts.

The primary purpose of the paper is to discuss the issues surrounding financial reporting which have bearing on the usefulness of the financial statements. Financial statements are one of the sources easily available to users in order to understand the financial position of a company. Lev (1989), for instance, claimed that users frequently relied on financial statements, particularly the income statements, when making an investment decision. Though the use of conservative accounting methods has been argued to positively affect the quality (i.e., usefulness) of earnings (Bernstein and Siegel, 1979), its excessive use may result in the earnings being less valuable to the analysts, as the information in the financial statements may be under-reported.

Two sectors, namely pharmaceutical and construction were selected for the purposes of discussion and illustration. The two sectors were selected because they were affected differently by the use of accrual accounting. As a result of the different effects of accrual accounting, their reported profitability data is also expected to be significantly different. In order to intuitively explain the difference in the profitability data, the Ohlson model (1991) was utilised.

Considering also the nature of the operating environment, each of the sector's annual accounting earnings is greatly influenced by its future earnings capacity. For the pharmaceutical sector, its periodic earnings are expected to be low compared with the construction sector. The reason is that accounting recognises earnings in the books as it is realised (i.e., conservatism). For instance, in the pharmaceutical sector, a discovery of a new drug will not result in immediate recognition in the book in the form of income (or cash). However, once the market is aware of the new finding, the new information will have an almost instantaneous impact on the share price to reflect the company's future earnings generation capacity, as suggested in the efficient market hypothesis. Hence, the difference between the market value of the firm would then be large as accounting will not pick up the new finding in the annual report until the finding is converted into a transaction (e. g., from the sale of the products).

In contrast, the earnings reported by the construction sector is not expected to be seriously affected by the 'accrual' accounting method as it is not expected to bring about news that result in its gradual recognition of income, except that it needs to recognise income either using the 'completion method' or the 'percentage method', which is not expected to be significantly different due to its short time horizon.

Four UK companies were selected for the purposes of discussion and illustration, with two companies representing each of the two sectors. The analysis involved financial data for the financial year 1993 for Fisons, Glaxo, Costain and Hewden-Stuart. The first two companies were from the pharmaceutical sector and the other two were from the construction sector.

THE PHARMACEUTICAL AND CONSTRUCTION SECTORS COMPARED

The companies selected were UK companies listed on the London Stock Exchange. The financial data for the 1993 financial year of the four companies were extracted from the Datastream, and they are presented in Table 1.

Table 1
Summary of Financial Data (in British Pounds)

Company	Mkt. Value (million)	Book Value (million)	Difference (million)	ROE* %
Fisons (pharmaceutical)	926.063	494.6	431.463	13.33
Glaxo (pharmaceutical)	16.589	5.043	11.500	7.94
Pharmaceutical Sector (1993)				30.81
Costain (construction)	148.879	225.2	(76.321)	(4.95)
Hewden-Stuart (construction)	381.796	135.754	246.754	11.08
Construction Sector (1993)				(2.37)

* assuming the clean surplus relation holds
** brackets indicate negative values

From Table 1, we have evidence that the difference between the market value and the book value of equity of the pharmaceutical companies is greater (and significantly higher) than that of the construction companies. From Ohlson's model, the difference is attributable to the present value of expected future abnormal earnings. In other words, the difference between the market value and the book value represents the goodwill of the companies. The greater the difference, the more profitable the company is expected to be. This contention is reflected in the return on shareholders' equity (ROE) (i.e., accounting rate of return (ARR), assuming the clean surplus relation holds) whereby the pharmaceutical companies experience significantly higher ARR than the construction companies. In fact, our data for total companies in each of the two sectors further supported our contention, where the ROE for the pharmaceutical sector was about thirty one percent while that for the construction sector was less than 0 (i.e., a loss).

According to Ohlson's model, using the residual income approach, if the present value of expected future residual income is positive, we know that the company is experiencing a higher accounting rate of return than its cost of capital (i.e., ARR > cost of capital). Therefore, from Table 1, we observe that the pharmaceutical companies have returns which are higher than the costs and hence the sector is more profitable than the construction sector. How can we explain this observation in terms of the real operating environments of the two sectors?

Several explanations could be offered to reconcile why this might be happening. First, in general, almost all of the assets possessed by a construction company are tangible and hence they are readily measurable and recognisable in accounts. Consequently, the recognition of these assets drives up the asset value and therefore (from the accounting equation) the equity value will also increase accordingly. Because the book value is higher, the difference between the market value and the book value is lower, which thus suggests lower profitability.

In contrast to a construction company, a pharmaceutical company carries far fewer assets on its balance sheet. The reason is that many of its assets are not recognisable within the current generally accepted accounting principles. In other words, most of its assets are invisible (e.g., patents and R&D) and hence they are unrecognisable (unless they result from an external purchase). As the tangible assets in the balance sheet would generally need to be depreciated (or amortised), the depreciation (or amortisation) would depress the reported earnings in the profit and loss account. Non-recognition of intangible assets causes the book value of the assets to be depressed and thus increases the earnings in the future. Hence, this is why we observe that the difference in the market value of equity of a construction company is substantially less than that of a pharmaceutical company.

In the directors' section of the 1994 annual reports of Glaxo, the director did recognise the difference between the market capitalisation (i.e. the market value) and the book value of equity (p. 21). The directors pointed out the fact that patents and trade marks are not recorded when in reality, these are the assets which drive up the market value of the equity and these are also the

assets which contribute the most to the market value of the equity. Moreover, as the products of a pharmaceutical company are usually patented, this protection ensures the company will enjoy a persistent stream of future earnings from the sale of the patented products.

Secondly, the concept of earnings persistence may also explain the difference in the company's reported profitability. If the earnings persistence is deemed to be one, it means that (from Ohlson's model) earnings are the key determinant of the price (as in the case of a pharmaceutical company). If, on the other hand, earnings are from transitory sources (i.e., earnings persistence is deemed to be zero), the book value of equity will largely determine the market value (as in the case of a construction company).

The earnings sources of a pharmaceutical company are argued to be primarily permanent in nature because their products are patented and have trademarks which allow the company to enjoy the benefits without having to face competition for many years. This is not the case for a construction company because it has to develop projects and each project stops contributing towards the earnings sources as soon as the project is completed. Hence, no project contributes persistent earnings sources beyond its completion stage. However, the company's ability to produce future abnormal earnings depends on the quality of the projects it develops, the costs management, and the ability to complete the projects on time.

The fact that accounting earnings are time-series dependent (i.e., they are autoregressive) provides the third explanation for the difference in profitability between the two sectors. In the semi-strong efficient market hypotheses, all information is reflected in the share price as soon as it is available and hence there is no opportunity for abnormal returns. Going back to the pharmaceutical sector, if a pharmaceutical company successfully develops a product of commercial value and is subsequently patented, the market will immediately adjust the share price of the company. However, accounting does not recognise the 'expected' future increase in the company's wealth until it is recognised in the form of sale. Due to this lag in the recognition of the 'expected' increase in the company's wealth, accounting gradually picks up the increase in wealth over time in the form of earnings.

This gradual picking up of the 'windfall gain' is known as the time-series dependence of earnings. This is why we observe that the present value of the expected future abnormal earnings for a pharmaceutical company is larger than that of a construction company.

In the construction sector, a company is permitted to recognise its profits on the percentage-of-completion basis (as the project progresses). This approach is not permissible in a pharmaceutical company (i.e., recognition of profits while the product is at the stage of development is not allowed) because no such provision is available in the current accounting standards. Because the profits realised become part of the book value of equity (in the form of retained earnings), this is why the difference between the market value and the book value of a construction company is lower than that of a pharmaceutical company.

Categorising earnings components as either being purely transient or permanent is important because a company cannot survive long if its earnings components are of transitory nature. That is why a financial analyst should not take the profitability data at its face value. Therefore, the analyst may need to assign each item in the profits and losses account as either having a persistence level of 1 or 0 or in between the two. In the short term, a company may be able to increase its reported profits through sale of its fixed assets, rewriting back its loss provisions on reorganisation costs. However, these events are not expected to recur in the future as its assets will soon dry up.

Additionally, as the products of a pharmaceutical company are patented, the only possible method of obtaining the rights as well as the know-how of other companies is through acquisitions. Analysis of the accounts of both the pharmaceutical companies reveals that both companies had large sums of goodwill arising from acquisitions written off to reserves. For example, up to 31 December 1993, Fisons had written off goodwill to reserves amounting to £625.4 million. Glaxo, on the other hand had, until 1993, written off goodwill to reserves amounting to £82 million. The construction companies being studied, on the other hand, did not write off goodwill as much as the pharmaceutical companies. The writing off of goodwill to

reserves has inevitably depressed the book value of equity of the pharmaceutical companies. Perhaps, this could offer another explanation for the large difference in the market value and the book value of equity of the pharmaceutical companies.

One problem arising from relying on profitability data is that a financial analyst may lose sight of the importance of other data available in the financial statements. For example, a pharmaceutical company may appear to be very profitable compared with a company from the construction sector. However, as many of the assets of a pharmaceutical company are not separable from the entity (i.e. intangible assets), the company can only sell small parts of its assets separately. In the event of liquidation, the total proceeds may not be high (because, in the event of liquidation, all intangible assets are worthless) and thus the shareholders (being the residual claimants) may receive nothing. On the other hand, the picture is slightly different for a construction company. As many of their assets are separable and readily marketable, and in the event of liquidation, the shareholders may be able to receive 'something' from the liquidation. Additionally, if a company is under receivership, most of its intangible assets, which originate mainly from goodwill, will be worthless. This is because goodwill is usually associated with a financially "healthy"company.

Finally, though profitability may appear to be very important in valuing a company's share price, Ohlson's model suggested that the value a company's equity did not depend on the set of valuation rules adopted. This is because a reduction in one of the terms on the right hand side of equation will be identically offset by an increase on another term of the equation. Hence, it may be tempting to inflate the reported earnings and deflate the equity value in short term, but for a longer time horizon, this will not affect the share price valuation. Therefore a one-off windfall gain will not make any difference to the share value.

EARNINGS MANAGEMENT

Current accounting policies provide tremendous opportunities for managers to 'massage' earnings. According to Schipper (1989), management

manipulated earnings in order to achieve its hidden ends. The accrual accounting method is the most frequently employed technique to manage earnings as it does not result in the auditor's making a note in his or her report as compared with a switch in the accounting policies. Among the factors that have been identified as contributors to earnings management are: probability of breaching debt covenants (e.g. Citron, 1992; Press and Weintrop, 1990; Watts and Zimmerman, 1986; Zmijewski and Hagerman, 1981; Christie, 1990), separation of ownership (e.g., Warfield *et al.*, 1995), and risk (Warfield *et al.*, 1995).

All the companies under analysis adopt the policy of writing off purchased goodwill to reserves. By doing this, the company can escape from charging the goodwill to the profit and loss account in the future (in the form of amortisation) and hence the reported earnings will not be depressed by the subsequent write-offs. Though both Ohlson's model and the efficient market hypothesis suggest either method, i.e., writing off the goodwill or charging it, will not change the price of the share, the managers always oppose the idea of amortising the goodwill to the profit and loss account. One possible rationale was that the decline in the reported earnings would make issuance of debt more expensive and also the decline would adversely affect the contracts that exist between the management and the shareholders (i.e., the compensation plan) and between the management and the debtholders (i.e., the debt covenants).

Interest capitalisation offers another opportunity for manipulation, especially in the construction sector. Capitalisation of interests on debts issued to finance a development project enables a construction company to smooth its earnings by spreading the amount of interest over longer periods as opposed to charging the interest costs to the income statement in the period of incurrence. Costain (1994), for example, capitalised the interest expense to the fixed assets it developed. This practise effectively makes the profit and loss account look healthy. This opportunity provides an increase both in the book value of assets (and hence equity) and the reported earnings. Hence, this will make a company's balance sheet and profit and loss account look better (i.e., lower gearing ratio and higher reported earnings). Therefore, the company may be able to escape from breaching debt-covenants and obtain loans at lower interest rates, or even receive a higher bonus.

Further investigation also found that both Costain and Fisons maintain an assets revaluation reserves account. However, investigation into their accounting policies did not find details on the frequency and method of revaluations employed. Because the existing standards are not very specific on this subject, companies can revalue their assets as they wish. The effect of an upward revaluation is an increase in the reported book value (however the associated impact on the profit and loss account is not immediate and perceived to be insignificant, since the period of depreciation is usually very long). The impact of a downward revaluation is a depression on the book value of the equity, but if the company expects to sell the assets in the very near future, it will be able to realise a large gain (on the disposals). Hence, this opportunity enables the managers to manage earnings by timing the revaluation of assets and to realise large gains in the event of disposing "downwards" revalued assets.

The fact that a holding company can use the equity method to account for an investment in a subsidiary company if the holding company owns less than fifty one percent in equity interest can provide an opportunity for the holding company to manage earnings. In the event that an investee company earns high profits, the investor company will continue to hold an investment of up to fifty percent interest in order to boost its reported income. However, in the event that the investee company is losing money, the holding company will reduce its stake to the extent of enabling the use of the equity method, so that they will not share the losses experienced by the investee company. The advantage of using the equity method is that the investor company keeps accumulating the share profits of the investee company, but it may never realise the profits in the form of dividends unless the investor company has the power to influence significantly the financial decisions of the investee company. Another advantage of using the equity method is that the investor company can hide the true *gearing ratio* because in its balance sheet it only needs to show a single figure (representing the net worth of the investee company). The fact that the investee company is highly geared is not shown in the group accounts.

Costain, for example, has an interest of forty nine percent in Yahya Costain LLC (note 30) which was about two percent short of being a majority

shareholder. We may wonder why Costain does not own a fifty one percent interest in Yahya Costain which would enable it to become the majority shareholder. Additionally, Costain also owns a fifty percent interest in the equity (one percent short of majority control) in Alcaidesa Costain Agroman S.A (note 30).

Finally, almost all of the companies being investigated "guarantee" the loans of their subsidiaries or associate companies. In the case of a subsidiary company, loan guarantee is not really a problem because the loans will be consolidated in the group accounts. But in the case of associate companies or quasi-subsidiaries, these loans are not consolidated. The loans issued by the associate companies or the quasi-subsidiaries may effectively be the loans issued by the holding company, and the associated companies or the quasi-subsidiaries function as vehicles for the loans. This practice effectively allows the investing company to avoid reporting the loans in its balance sheet and the interest charges in its profit and loss account.

CONCLUDING REMARKS

In this paper, the author has intuitively applied Ohlson's model (1991) to companies from two different sectors: pharmaceutical and construction. Several explanations have been offered as to why the difference between the book value and the market value of equity is greater for a pharmaceutical company than that of a construction company. A large difference between the book value and the market value suggested higher profitability because a company with higher profitability earned higher rate of returns.

Though the model suggests that a pharmaceutical company is more profitable than a construction company, an analyst should not ignore investing in a construction company. The reason put forward was that in the event of liquidation, a construction company which has many separable assets may be able to give "something" to the investors from the proceeds of the disposal of its assets. Moreover the apparent high profitability ratio of a pharmaceutical company may be simply because of a low depreciation charge and its monopoly power (through its patented products). A well-diversified portfolio

should comprise assets whose returns are not perfectly correlated because its variance will then be less than the variance of the assets individually. It seems that the two sectors operate in different environments and hence a combination of the two sectors in a portfolio will result in lower variance (for the portfolio).

One possible problem with Ohlson's model is the assumption of the *omega* being less than one. This assumption will cause goodwill to decay gradually over time which in reality is not necessarily true. This situation may be true if we hold constant the current structure of the company and there are no new investment projects in the future. Otherwise, the assumption is not practically true.

Nonetheless, Easton and Harris (1991) provided evidence supporting Ohlson's model. Using both pooled-cross sectional and time-series samples, they found that both the level of earnings and the change in earnings level explained variance in the stock returns better than the model using either the earnings level or the change in earnings level separately.

Although profitability data is extensively used in drawing inference on the share value of a company, it is all back to cash. Unless the profitability data can be converted into cash, the profitability data is meaningless. If cash is not realised, the company will have difficulty funding its working capital or meeting its current debts or servicing its long term debts. Opportunities for earnings management can make the gap between accrual earnings and cash flows from operations wider over longer periods. As the company can no longer meet its working capital and debt requirements, it will eventually collapse.

A recent study by Breton and Taffler (1995) should provide an important signal to the financial analysts. Their study showed that the stockbrokers did not significantly make adjustments to window-dressed accounts. Those who made adjustments were found to be significantly more experienced. The findings suggest that unless the management is concerned with ethical issues of earnings manipulations, the market will not be efficient as it will likely make decisions based on the distorted pictures. Given the presence of

information asymmetry and the diverging interests among the various parties in a firm, it is expected that unless ethical issues are a concern of all parties, it is difficult for users to get the "real" picture of a firm.

In summary, the evidence presented in this paper seemed to support our intuition and contention. Nonetheless, since this study used only four companies, it is thus inappropriate to generalise the findings to all firms. Therefore, a future study may use a larger data set so that a definite conclusion could be arrived at.

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APPENDIX
LIST OF RELEVANT ACCOUNTING STANDARDS

SSAP 1: Accounting for associated companies
SSAP 12: Accounting for depreciation
SSAP 13: Accounting for research and development
SSAP 14: Group accounts
SSAP 22: Accounting for goodwill
SSAP 23: Accounting for acquisitions and mergers