



ADVANCED TOPICS IN FINANCE AND ACCOUNTING

FINANCIAL STATEMENT ANALYSIS

RAY BALL
S. P. KOTHARI

FINANCIAL STATEMENT ANALYSIS

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FINANCIAL STATEMENT ANALYSIS

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INTRODUCTION

This collection brings together thirty-four previously published articles on financial statement analysis. We have included several literature survey articles and have provided an introduction to each topic area. These put the individual articles into perspective and provide exposure to a literature that is much wider than can be contained in one collection.

To be selected for inclusion, an article had to satisfy three criteria:

1. *Results are of use in financial statement analysis:* the article provides insights that are of value in the practice of financial analysis.
2. *Approach is empirical:* the article presents data on financial statements and/or how they are used in any of a variety of settings.
3. *There is some underlying theory:* the results are based at least in part on some underlying structure (however loose or formal) that allows readers to generalize and thus to use the results in their own settings.

The articles in this collection, and the criteria used to select them, reflect the revolutionary changes that have occurred in our knowledge of financial statements, and in their use, over the past twenty-five years. During that period, financial statement analysis has been transformed from a largely *ad hoc* field, rife with untested and often illogical conjectures, into a comparatively sophisticated discipline. It has been transformed by a wide range of closely related developments, including:

- Revolutionary changes in the theory of financial markets
- The now-widespread use of empirical methods to test theory
- The availability of many large, inexpensive, and accessible financial databases, containing both financial statement and financial market information, for both practitioner and academic use

- A breathtaking reduction in the computing costs of analyzing financial databases
- An explosion in the number of business school graduates trained in sophisticated methods of financial statement analysis
- The rapid growth in assets managed by financial institutions that are equipped with well-staffed, well-funded, professional research facilities

The future generation of financial analysts now must be trained to at least understand the types of empirical analyses contained in this literature. While it is designed primarily for courses on financial statement analysis, the collection also will be useful in capital markets, investments, and security analysis courses and in accounting theory or other research-level courses in accounting. It can be used in conjunction with cases or with texts that cover more of the mechanical and institutional aspects of financial statement analysis.

The articles are organized into five parts. The first part covers the relation between financial statement information and the stock market, which is where financial statement information is most widely and actively used. Emphasis is placed on reported earnings information, due in turn to the emphasis on earnings by financial analysts and to its primary role in determining value in the long term. The part contains six contemporary contributions and two survey articles. The second part introduces cash flows and accounting accruals, which are the two major components of reported earnings. It then includes four articles on alternative methods of accounting and their effects on analyzing financial statements. The third part covers earnings forecasting, including: statistical time series models that use only past earnings to forecast future earnings; models that use information in financial statements, other than earnings, to forecast earnings; properties of professional financial analysts' earnings forecasts; and the performance of the Value Line Investment Survey. The fourth part introduces the analysis of risk, from the perspectives of both lenders and stockholders. The studies here investigate the determinants of investment risk (and P/E ratios) in the stock market and the determinants of risk (and bankruptcy) in the bond market. The final part focuses on the role of financial statement analysis in the more unusual context of corporate control contests, including predicting acquisition targets, management buyouts, and leveraged buyouts.

Because the part themes are not mutually exclusive, the organization we have chosen is unlikely to be optimal for all courses of study. We therefore recommend that instructors experiment with the order in which the articles are prescribed. Each part begins with an introduction that places the part in perspective and briefly describes the articles contained in it. In each part's introduction, references to articles reproduced in this collection are set in **bold**. Other references are to sources that are listed at the end of the collection.

The original publication of the articles was approximately evenly distributed between accounting and finance journals. These include *Accounting Horizons*, *The Accounting Review*, *Financial Analysts Journal*, *Journal of Accounting and Economics*, *Journal of Accounting Research*, *Journal of Finance*, *Journal of Financial and Quantitative Analysis*, *Journal of Financial Economics*, and *Midland Corporate Finance Journal*. We acknowledge the cooperation of all the authors and publishers represented in the collection and our indebtedness to many authors who have contributed to a vibrant literature but whose work we have not been able to include. We also gratefully acknowledge the encouragement and support of Kenneth MacLeod at McGraw-Hill and the professional secretarial assistance of Jane Muellner.

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FINANCIAL STATEMENT INFORMATION AND STOCK PRICES

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The first part deals with evidence on the relation between financial statement information and stock prices. We begin with the stock market because this is where financial statement information is most widely and actively used. Not surprisingly, it is one of the most thoroughly researched areas in financial statement analysis. Use of financial statement information in the credit and long-term debt markets is deferred to Part IV.

Emphasis on Earnings Information

The majority of the research in this area deals with the relation between earnings and stock prices. This also is not surprising, because earnings is the single most important

item in contemporary financial statements. Earnings literally is “the bottom line.” Over the lifetime of a corporation, essentially all of the events influencing the value created in it are ultimately captured in its earnings. This is because, as a matter of law, over the corporation’s lifetime all the distributions it makes to its stockholders either are dividends paid out of earnings or are capital distributions (i.e., returns of contributed capital). Essentially all the added value, over and above the capital contributed by stockholders, is therefore reflected in lifetime earnings, by construction.¹ Thus, in the long term, there is a fundamental linkage in law between earnings, dividends, returns to stockholders, and the performance of the corporation and its managers.

In the short term, the connection between earnings and returns to stockholders is not as precise, due to difficulties in calculating earnings over short intervals (e.g., calculating depreciation, accounts receivable, and revenues). Earnings calculation problems arise because many of these calculations require estimation. For example, calculating labor costs requires an estimate of future outlays for vacations, pensions, or health care benefits that employees earn as a result of their current work. Calculating revenues to include credit sales requires an estimate of the proportion of credit sales that ultimately will not be collected. As students of even introductory accounting know, all accruals are a matter of timing, because over the life of a corporation, its aggregate earnings is determined by the difference between the cash invested in it and the cash withdrawn from it. Accruals are made because investors are not prepared to wait until the end of the corporation’s life for information about its performance. As Keynes once said, “in the long run we are all dead.” But because it is expensive and perhaps even impossible to implement a perfect system of accrual accounting, however defined, short-term accounting earnings necessarily is an imperfect measure of value to the investor.

Despite imperfections, the evidence shows that short-term (that is, quarterly and annual) earnings is an important determinant of stock prices, for several interrelated reasons. First, while short-term earnings is by no means a perfect measure, it does reflect some (though certainly not all) of the contemporary actions influencing a corporation’s value, as the studies in this part reveal. Second, the methods of accrual accounting that have evolved over centuries into Generally Accepted Accounting Procedures (GAAP) in the U.S., and into its equivalents in other countries, constitute a relatively refined and successful system for producing useful information about the firm. This topic is covered in the second part. Third, current earnings is a relatively good predictor of future earnings, and hence short-term earnings is more closely tied to long-term value than it would otherwise be (the evidence of this is contained in Part III). Fourth, even in the short term there is a tie between dividends and earnings, arising from legal constraints on the distribution of contributed capital which essentially limit dividends to current and past retained earnings. For all these interrelated reasons, the importance of earnings (and earnings forecasts) in financial statement analysis is easy to understand.

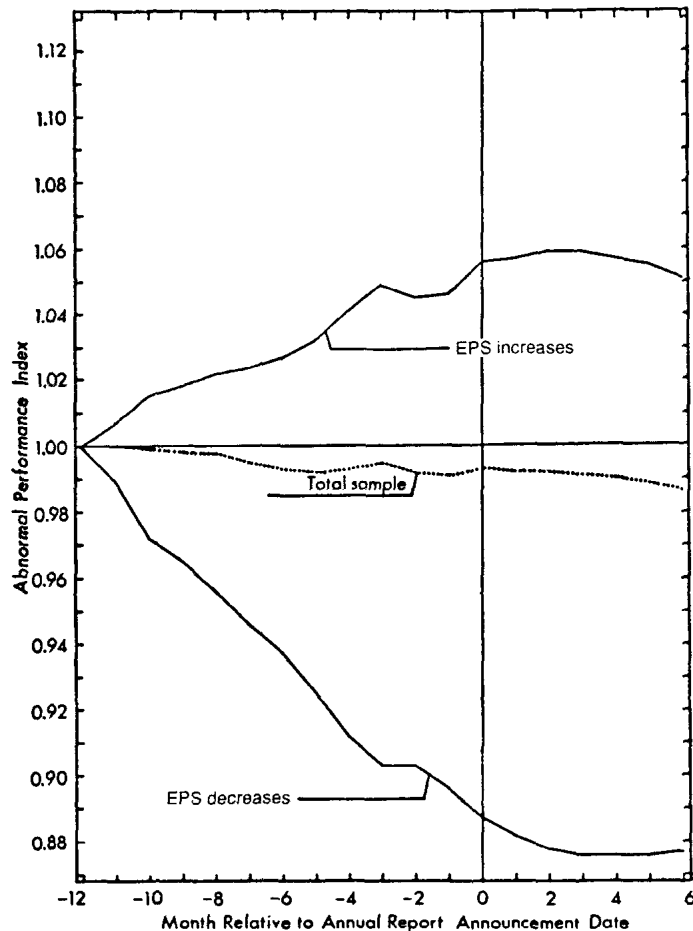
Early Studies of Earnings and Prices

The seminal research showing the existence of a relation between earnings and stock prices was done by Ball and Brown (1968). They studied the average firm’s response to

¹ The exception is events that influence the timing of cash flows. As **Easton, Harris, and Ohlson (1992)** show clearly, neither law nor accounting incorporates discounting in the same fashion as valuation. For example, the action of deferring a capital expenditure (and its cash flows) for one year will influence present value, but not lifetime earnings.

annual earnings. They reported the following summary graph, which depicts the typical movement of firms' stock prices over the year before, and the half year after, the firms announce their earnings. Firms with increases in earnings are shown separately from firms with decreases.

Relation between annual earnings and stock prices
(Firms categorized by sign of annual earnings change)



Source: After Ball and Brown (1968)

Earnings is defined here as earnings per share (EPS). Time, as it is depicted on the graph, is defined relative to the time of the earnings announcement, and has become known as "event time." Thus, the month of the announcement is described as month 0, and can be different points in calendar time for different firms (depending on how long they take to announce their earnings). Six months before the announcement is denoted by -6, three months after is +3, and so on. The announcement is made some time into the next fiscal year because earnings here is the full-year figure and also because there are delays

in preparing and auditing the accounts.² Prices are scaled by the stock price one year before the announcement, so the relative price at month -12 always is 1.00. Price movements are calculated after controlling for movements in the average stock in the entire market (i.e., the “index”), which means that on the graph the market index tracks the horizontal axis over time (i.e., always has a value of 1.00). Thus, 0.96 represents a return that is 4 percent below the return on the index. The index averaged approximately 10 percent over the period studied. The sample is 261 firms making over 2,000 annual earnings announcements during 1957–1965.

The graph reveals four major features of the relation between earnings and stock prices:

1. *Comovement in earnings and stock prices.* The average firm with increased (decreased) earnings also has increased (decreased) stock prices during the year, relative to the market as a whole. Thus, at least some of the information flowing into stock prices during the year is captured in the annual earnings number released after the end of the year.
2. *Anticipation and timeliness.* Throughout the year covered by the earnings report, stock prices move in anticipation of its contents. By the time it is released, the earnings report is largely anticipated, so it is not a very timely information release. Anticipatory price movements are due to announcements of quarterly earnings, managers' earnings forecasts, analysts' forecasts, earnings announcements of other firms, news about sales or expenses, rumors, insider trades, etc. (Many subsequent studies have traced these information sources down more closely.)
3. *Reaction at time of announcement.* Earnings information is not completely anticipated, however, so prices typically react in the same direction as the earnings news, at the time of its release. (Subsequent studies of transaction-by-transaction data have confirmed this more closely.)
4. *Efficiency and anomaly.* Most of the price reaction is completed immediately after earnings are announced. There is little delay in the reaction, so there is little opportunity to earn abnormal returns from the market systematically erring in its response to the announcement. This is known as market “efficiency” [see Fama (1991) for a review]. On the other hand, there is some evidence of inefficiency in the graph because prices continue to “drift” after the earnings are announced, suggesting some opportunity to profit from a slow reaction.

The basic results in Ball and Brown (1968) have been replicated and extended in a wide range of studies. These include studies of earnings announcements in more than ten countries; studies of different time periods; studies of quarterly earnings [commencing with Jones and Litzenberger (1970) and Brown and Kennelly (1972)] as well as studies of annual earnings that have been aggregated for up to ten years [Easton, Harris, and Ohlson (1992)]; and studies of stock price movements over intervals ranging from the minutes sur-

² In addition, managers might delay the earnings announcement, either to delay bad news [Givoly and Palmon (1982), Chambers and Penman (1984)] or to avoid strategic disclosure to competitors, suppliers, or customers [Verrecchia (1983)]. Note that the announcement date here is the date of the first official earnings announcement, which precedes the date of the mailing of the annual report by at least several weeks.