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Two Essays on the Role of Accounting Information in Firm Valuation: Empirical Evidence from Japan

by

Sandra Wai Man HO

A thesis submitted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy at the Department of Accountancy The Hong Kong Polytechnic University

July 2000
# Two Essays on the Role of Accounting Information in Firm Valuation: Empirical Evidence from Japan

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Abstract of thesis entitled 'Two Essays on the Role of Accounting Information in Firm Valuation: Empirical Evidence from Japan'

submitted by Sandra Wai Man HO

for the degree of Doctor of Philosophy

at the Hong Kong Polytechnic University in July 2000

ABSTRACT OF THESIS

This thesis consists of two essays and provides empirical evidence on the role of accounting information in firm valuation, using a sample of Japanese listed firms. The first essay, framed within the context of Feltham and Ohlson (FO: 1995), examines the extent to which stock price is explained by three accounting fundamentals, namely book value of equity, (abnormal) operating earnings, and operating assets. In addition, it assesses how earnings persistence, accounting conservatism, growth, and their combinations differentially affect the role of accounting measures in firm valuation.

Results confirm that book value of equity and abnormal operating earnings are positively associated with prices. However, contrary to the prediction of FO (1995), operating assets have a negative instead of positive impact on firm valuation, which implies aggressive accounting. This is contrary to common accounting practices, especially given that Japanese accounting is more conservative than US accounting (Cheung, Kim, and Lee; 2000). The negative result may also be interpreted as investors not perceiving operating assets rationally. Alternatively, multicollinearity of book value and operating assets
may drive the coefficient of operating assets negative. Converting the price model into a goodwill model reveals the positive valuation impact of operating assets.

In addition, evidence shows that the market places higher value on firms maintaining higher earnings persistence or adopting more conservative accounting practices but not on firms undergoing higher growth. Evidence also supports that, other things being equal, earnings persistence, but not growth, accentuates the valuation effect of accounting conservatism. The negative results associated with growth may be contributed by the inconsistent results obtained for the linear information model (LIM). Alternatively, the results may be explained by growing firms having higher proportion of undepreciated new assets, thus mitigating the effect of conservatism on book values (Beaver and Ryan, 2000). On the other hand, the negative results may fit into the scenario of firms having negative growth. While the Japanese stock market boomed in the 1980’s, it experienced a sharp downturn from 1990 onwards. Inferred from Beaver and Ryan (2000), negative growth results in higher unrecorded goodwill.

Furthermore, inferred from Ryan (1995) and Beaver and Ryan (2000), an alternative measure of accounting conservatism based on the proportion of depreciable fixed assets gives results supporting the positive valuation effect of accounting conservatism. However, accounting conservatism inferred from the remaining useful lives of depreciable assets decreases rather than increases goodwill. This may be interpreted as investors viewing companies having assets with short remaining lives as more conservative since these firms depreciate asset costs faster. Moreover, firms with assets of long remaining lives have relatively
higher proportions of new assets on hand which have book values equal to market values (Ryan, 1995), therefore their book values are relatively less understated.

Results are sensitive to macroeconomic and industry variables added to proxy for the other non-accounting information in the FO (1995) valuation model. For instance, the year and industry dummies increase the adjusted R-squares of the valuation models by 4% to 29%, indicating that such non-accounting information has incremental explanatory power beyond abnormal operating earnings and operating assets in explaining the variation in unrecollected goodwill. Their inclusion also accentuates the valuation impact of operating assets but decreases the valuation impact of accounting conservatism. Moreover, the valuation effect of operating assets no longer increases with conservatism. Other than these changes, they do not significantly reverse the general trend of the results. These negative results may be attributed to the failure of the linear information dynamics to precisely capture the effects of accounting conservatism and growth of operating assets. Consistent with the findings of Myers (1999) and Stoerber (1996), high proportions of the empirical estimates of the conservatism and growth parameters in the LIM fall outside their restricted bounds, which are part of the crucial assumptions of the FO linear valuation model.

The second essay of this thesis examines the valuation effects of positive vs. negative earnings, book value and discretionary accruals, using a sample of Japanese listed firms over the period of 1975-1995. Consistent with US evidence such as Hayn (1995), Jan and Ou (1995) and Collins et al. (1999), omission of book value from the simple earnings capitalization model causes Japanese stock prices to be negatively,
though insignificantly, associated with losses but significantly positively associated with profits. The negative price-earnings association is weaker for Japanese loss firms while the positive price-earnings association is much stronger for profit firms compared with US evidence. This is consistent with extant literature documenting the pervasive use of more conservative accounting practices by Japanese firms than by US firms, and the stock bubble of the Japanese market.

The negative price-earnings association for loss firms is reversed when book value of equity is added as an omitted correlated explanatory variable. Book value is value-relevant and has incremental explanatory power beyond earnings. Moreover, its omission causes a positive bias of the coefficient on positive earnings. Results also reveal that investors value earnings (book value) more than book value (earnings) for profit (loss) firms. This is because investors view losses as transitory whereas book value reflects the abandonment value of loss firms, consistent with Collins et al. (1999) and Burgstahler and Dichev (1997), among others.

Lastly, evidence suggests that the Japanese market prices discretionary accruals, which enhance the value relevance of reported earnings. They signal managers’ private information on firm profitability and help smooth income in a way desirable by investors. Results are robust to various sensitivity checks including foreign investors’ holdings, firm size, the level of debt financing and strength of Keiretsu ties. Overall, discretionary accruals are more significantly priced in Japan than in the US, this is consistent with the unique corporate governance of Japan. The joint ownership of debt and equity by financial institutions, interlocking
ownership, significant inter-group (Keiretsu) holdings, together with group management dynamics result in far closer ties and less information asymmetry between Japanese investors and management (Ho et al., 2000; Jacobson and Aaker, 1993; Kagono et al., 1983). Hence there is less incentive for managerial opportunism in Japan than in the US, rendering discretionary accruals relatively more informative and significantly priced by the Japanese market.
ACKNOWLEDGEMENTS

I would like to express my hearty gratitude to Professor Jeong-Bon Kim, chief supervisor, and Dr Richard Chung, co-supervisor for their invaluable advice, insightful comments, and immeasurable guidance, encouragement and support. This thesis would not have been in existence without their patient supervision and constant inspiration. My appreciation also extends to Dr Ben-Hsien Bao, who has given very useful comments on my proposal and has been very supportive throughout my study. I am very grateful to Dr Louis Cheng, Professor Gerald Lobo and Professor Samuel Tung for their constructive comments and suggestions. Finally, a special thanks to Professor Rohit Jain for inspiring me to embark on the study and his insightful comments and continual support are gratefully acknowledged.
FIRST ESSAY

EARNINGS, BOOK VALUE

AND

ACCOUNTING CONSERVATISM

IN VALUATION OF JAPANESE FIRMS
FIRST ESSAY: EARNINGS, BOOK VALUE AND ACCOUNTING CONSERVATISM IN VALUATION OF JAPANESE FIRMS

ABSTRACT

This first essay of the thesis provides empirical evidence on the role of accounting information in firm valuation, using a sample of Japanese listed firms. Framed within the context of Feltham and Ohlson (FO: 1995), it examines the extent to which stock price is explained by three accounting fundamentals, namely book value of equity, (abnormal) operating earnings, and operating assets. In addition, it assesses how earnings persistence, accounting conservatism, growth, and their combinations differentially affect the role of accounting measures in firm valuation.

Results confirm the hypothesis that book value of equity and abnormal operating earnings are positively associated with prices. However, contrary to the prediction of FO (1995), operating assets have a negative instead of positive impact on firm valuation, which implies aggressive accounting. This is contrary to common accounting practices, especially given that Japanese accounting is more conservative than US accounting (Cheung, Kim, and Lee; 2000). The results of negative association may also be interpreted as investors not perceiving operating assets rationally. Alternatively, multicollinearity of book value and operating assets may drive the coefficient of operating assets negative. Reformulating the price model to a goodwill model reveals the positive valuation impact of operating assets.
In addition, evidence shows that the market places higher value on firms maintaining higher earnings persistence or adopting more conservative accounting practices but not on firms undergoing higher growth. Evidence also supports that, other things being equal, earnings persistence, but not growth, accentuates the valuation effect of accounting conservatism. The negative results associated with growth may be contributed by the inconsistent results obtained for the linear information model (LIM). Alternatively, the results may be explained by growing firms having higher proportions of undepreciated new assets, thus mitigating the effect of conservatism on book values (Beaver and Ryan, 2000). On the other hand, the negative results may fit into the scenario of firms having negative growth. While the Japanese stock market boomed in the 1980’s, it experienced a sharp downturn from 1990 onwards. Inferred from Beaver and Ryan (2000), negative growth results in higher unrecorded goodwill.

Furthermore, inferred from Ryan (1995) and Beaver and Ryan (2000), an alternative measure of accounting conservatism based on the proportion of depreciable fixed assets gives results supporting the positive valuation effect of accounting conservatism. However, accounting conservatism inferred from the remaining useful lives of depreciable assets decreases rather than increases goodwill. This may be interpreted as investors viewing companies having assets with short remaining lives as more conservative since these firms depreciate asset costs faster. Moreover, firms with assets of long lives have relatively higher proportions of new assets on hand which have book values equal to market values (Ryan, 1995), therefore their book values are relatively less understated.
Results are sensitive to macroeconomic and industry variables added to proxy for the other non-accounting information in the FO (1995) valuation model. For instance, the year and industry dummies increase the adjusted R-squares of the valuation models by 4% to 29%, indicating that such non-accounting information has incremental explanatory power beyond abnormal operating earnings and operating assets in explaining the variation in unrecorded goodwill. Their inclusion also accentuates the valuation impact of operating assets but decreases the valuation impact of accounting conservatism. Moreover, the valuation effect of operating assets no longer increases with conservatism. Other than these changes, they do not significantly reverse the general trend of the results. These negative results may be attributed to the failure of the linear information dynamics to precisely capture the effects of accounting conservatism and growth of operating assets. Consistent with the findings of Myers (1999) and Stoerl (1996), high proportions of the empirical estimates of the conservatism and growth parameters in the LIM fall outside their restricted bounds, which are part of the crucial assumptions of the FO linear valuation model.
CHAPTER ONE: INTRODUCTION

Background, Motivation, and Objectives of the Thesis

The relation between stock prices (or their changes) and accounting numbers has been one of the main stream subjects of accounting research since Ball and Brown (1968) [see Lev (1989) for an extensive review of this literature]. This stream of empirical research has typically adopted the so-called informational perspective of accounting, and assumes that the forward-looking capital market fully reflects all available information without delay in determining equilibrium prices. The observed price is considered to be an efficient summary of all value-relevant information, and it is regarded as an unbiased estimate of a firm's future economic prospects. Under this perspective, the usefulness of accounting information can be assessed by focusing primarily on how the informationally efficient market reacts to the arrival of accounting information in the market rather than on how accounting fundamentals contained in published financial statements contribute to the explanation (and prediction) of the observed stock prices.

As noted by Penman (1992), previous market-based accounting research (which adopts the informational perspective) refers to current stock prices in order to infer the usefulness of accounting information, although an important question faced by investors is to infer stock prices by reference to accounting fundamentals. As a result, the literature has paid relatively little attention to the role of accounting fundamentals in the valuation of firms and/or the prediction of stock prices. This is due, in large part, to the lack of theory which establishes an explicit link between
the market value and accounting fundamentals. In this regard, Bernard (1995: p. 731) points out:

"[F]ramed within the so-called informational perspective, research since the late 1960s developed without much emphasis on the precise structure of the relation between accounting data and firm value."

Thus, previous research leaves still unresolved a fundamental question of how reported accounting numbers contribute to the measurement of the market value of the firm at equilibrium.

Recently, Ohlson (1995) has developed an equity valuation model which explicitly links firm value with accounting fundamentals, based upon few restrictive assumptions in addition to the clean surplus relation. Market efficiency is not a necessary condition for his model. A distinguishing feature of Ohlson's valuation model is its ability to express firm value in terms of two summary accounting measures: accrual earnings in income statements (a flow measure of firm value); and book value of equity in balance sheets (a stock measure of firm value). In particular, he demonstrates that the intrinsic value of a firm is the sum of book value and the present value of a stream of expected abnormal earnings (earnings net of the cost of using capital).

Accounting can be viewed as a process of classifying, summarizing and recording the value (or wealth) created in the production economy. An accounting system quantifies value (or wealth) or value accretion resulting from a firm's operating activities (production and sales) and financial activities (investment and financing). Based upon this intuition about the accrual accounting process, Feltham and Ohlson (1995: hereafter FO) have extended Ohlson (1995) by segregating a firm's
(net) assets into (net) financial assets and (net) operating assets. This distinction between the two types of assets is useful for the following reasons: financial assets are traded in a relatively perfect market, and thus, one can assume without much loss of generality that their market values equal the associated book values. Thus accounting measurements for financial assets are relatively straightforward.

In contrast, operating assets are not individually traded in a perfect market, and their values are in practice determined through a series of accrual accounting rules, such as revenue recognition criteria, revenue-expense matching principles, depreciation methods, etc. In selecting the proper accounting methods to value assets and liabilities, there are some important fundamental accounting concepts and principles to be observed and accounting conservatism is one of them. A more conservative accounting method is one that reports less cumulative earnings at any time than an alternative method, ceteris paribus (Davidson et al., 1988). As a result, the market value of operating assets in general deviates from (exceeds) the associated book value, thus creating unrecorded (positive) goodwill.

Building upon this separation of financial assets (financial activities) from operating assets (operating activities) within the clean surplus context, FO develop an equity valuation model which provides useful insight into how the observed market value (or unrecorded goodwill) is linked to abnormal operating earnings, and operating assets, both of which are observable. In particular, the FO model provides several testable implications. First, in the world of unbiased accounting, unrecorded goodwill is a sole function of abnormal operating earnings (operating earnings net of the cost of using operating assets). In other words, it arises as a
result of operating activities, not a result of financial activities. Second, in the
world of conservative accounting, the observed price is a positive function of book
value, abnormal operating earnings and operating assets. Stated alternatively,
unrecorded goodwill is determined by abnormal operating earnings and operating
assets. It is again not affected by financial activities. Third, and more interestingly,
in the world of conservative accounting, the valuation effect of abnormal operating
earnings is accentuated (positively affected) by the persistence of abnormal
operating earnings (hereafter earnings persistence), while the valuation effect of
operating assets is positively affected by earnings persistence, accounting
conservatism, and growth in operating assets. Finally, the valuation effect of
accounting conservatism is more (less) pronounced for firms with the higher
(lower) growth in operating assets and the higher (lower) persistence of abnormal
operating earnings.

This thesis consists of two essays and provides empirical evidence on the role of
accounting information in firm valuation, using a sample of Japanese listed firms.
In so doing, empirical tests are framed within the context of Feltham and Ohlson
(1995) for the first essay, and Subramanyam (1996) and Collins et al. (1999) for
the second essay. In particular, analyses in the first essay focus on: (1) the extent
to which the observed price is explained by three accounting fundamentals, namely
book value of equity, (abnormal) operating earnings, and operating assets; and (2)
how the role of these accounting measures in firm valuation is differentially
affected by earnings persistence, accounting conservatism, growth, and their
combinations. Analyses in the second essay focus on: (1) the relative value
relevance of earnings and book value for profit versus loss firms; (2) the extent to
which the stock market prices discretionary accruals; and (3) how the role of
discretionary accruals is differentially affected by firm size, firm leverage, foreign
shareholdings, and inter-group (Keiretsu) ties, which uniquely feature corporate
governance in Japan.

Providing Japanese evidence is of interest in its own right, given that the US and
Japanese equity markets are the largest in the world. Further, since the Japanese
market is operated under institutional environments that are different from the US
market, I am also interested in examining how institutional characteristics unique
to Japan differentially affect the role of accounting fundamentals in the valuation
of the firm. It is well known, for example, that market-to-book ratios or the
difference between market and book values (i.e., unrecorded goodwill) is much
higher for Japanese firms than for US firms (Bae and Kim, 1998). The extant
evidence suggests that this may be due to the pervasive use of conservative
accounting practices in Japan (which lead to downward biases in book value) and
the large discrepancy between market and book values of real estate held by
Japanese firms (Cheung, Kim, and Lee; 2000). In addition, Japanese corporate
groups are largely owned by non-individual investors, the most important of which
being financial institutions, such as commercial banks and life insurance
companies (see, e.g., Prowse 1990, 1992). Also, Japanese firms are characterized
by inter-locking ownership. In this thesis, I thus examine whether these
institutional characteristics differentially affect the valuation parameters of
accounting fundamentals.
Recently, Bernard (1994, 1995), Ou and Penman (1994), Penman (1996), Stober (1996), Penman and Sougiannis (1997), Frankel and Lee (1998), and Myers (1999) have empirically examined various implications of Edwards and Bell (1961), Ohlson (1991, 1995) and FO (1995, 1996) valuation models using US samples, and mixed results are obtained. For instance, Bernard (1994) applies the Edwards-Bell-Ohlson (EBO) valuation approach to study empirically the determinants of price-to-book (P/B) ratios, and by inference, market prices. EBO define firm value directly in terms of book value and earnings. It is surprising to find that, after controlling for the portion of P/B ratios that is explainable with current returns on equity, there is little or no relation between the remaining variation in P/B ratios and future realizations of profitability. Bernard (1995) provides evidence that current book value and three abnormal earnings forecasts explain 68% of the variation in price per share. Such results are obtained despite the assumptions of constant discount rates and conservatism across firms, and that the Value Line forecasts fully reflect available information, and the price per share is efficient with respect to that information. Penman and Sougiannis (1997) provide evidence to support that earnings calculated according to US generally accepted accounting principles can serve as a substitute for dividends as a forecast target in equity valuation analysis. Frankel and Lee (1998) estimate firms' fundamental values using I/B/E/S consensus forecasts and a residual income model. They find that firms' fundamental value is highly correlated with contemporaneous stock price, and that the book-to-price ratio is a good predictor of long-term cross-sectional returns.
On the other hand, Stober (1996) provides evidence that the market does not price accounting data as if they are conservative. More recently, Myers (1999) finds that, consistent with theory, accounting conservatism systematically influences the information dynamics. However, the linear information models (LIMs) of Ohlson (1995) and FO (1995) provide value estimates no better than book value alone. By comparing the price coefficients implied from the LIMs and the coefficients estimated from cross-sectional regressions of price on the (accounting) information variables, Myers finds that the LIMs imply inefficient weightings on the accounting numbers. Moreover, contrary to FO’s prediction, the median conservatism parameter of FO’s LIMs is significantly negative for even the most conservative firms. Myers attempts to modify the LIMs by introducing two parameters of conservatism but fails to provide better estimates for firm valuation.

In addition, Bar-Yosef et al. (1997), using a large sample of US manufacturing firms, provide evidence to reject the single-period lagged linear information dynamics. Instead, they find that earnings, book values and dividends are value-relevant for a multi-lagged information dynamic.

In the Asia Pacific region, Chung and Kim (2000) and Chung and Kim (1997a) test for empirical validity of Ohlson’s model using Hong Kong and Korean samples, respectively. To the best of my knowledge, however, few studies have attempted to directly examine empirical implications of the FO model. Given that the FO model is richer in context than Ohlson’s (1995), the results of this thesis could help us better understand the role of accrual accounting in firm valuation. Further, being one of the biggest capital markets in the world, Japan naturally offers a good opportunity for validating the FO model. However, this opportunity has not been
well explored in the past. A recent study by Cheung, Kim and Lee (2000) compares the strength of returns-earnings associations between Japan and the US, but their focus is different from that of the present study. Comparison of my Japanese results with the extant US ones can thus provide useful insight into the external validity of the Ohlson (1995) and Feltham and Ohlson (1995) models.

**Institutional Differences Between the US and Japanese markets**

The US capital markets, especially the New York Stock Exchange (NYSE) and the American Stock Exchange (AMEX), are characterised by diversified shareholdings, a high degree of informational efficiency owing to the efforts of thousands of financial analysts, a high degree of regulation and enforcement of rules by the exchanges and the Securities and Exchange Commission (SEC). The accounting information provided by US firms in their financial statements has a high degree of comparability across firms due to extensive reporting and disclosure rules in the US generally accepted accounting principles (GAAP). The quality of the audit for US listed firms is known to be high, due to the costs of litigation in the event of audit failure. The strict definition and enforcement of insider trading rules in the US also provide an informationally efficient level-playing field for capital market agents in the US (Crutchley and Hansen, 1989; Jensen et al., 1992; and Kang and Horowitz, 1993).

Apart from the US markets, the Japanese market is one of the largest equity markets in the world.\(^1\) In Japan, the economic, social and cultural environment,

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\(^1\) Frankel (1991) reports that the total stock market capitalization relative to the world market capitalization was 44% for Japan and 29% for the US in 1989.
accounting regulations and corporate governance are quite different from the US. The Japan stock market is characterised by cross share ownership and frequent insider trading by large shareholders, especially among firms in the same industrial conglomerates [keiretsu] (Jacobson and Aaker, 1993; Kang and Shivdasani, 1995).

Accounting rules in Japan, in many respects, differ from those in the US. The GAAP in Japan resemble those in Germany in that both have creditor protection and historical cost measurements as the two most fundamental underlying principles. Also, accounting rules in both countries (also in China) are closely tied to tax laws. In general, Japanese accounting is more conservative and tax-driven than US accounting (Bildersee, Cheh and Lee; 1990). As noted by Feltham and Ohlson (1995: p. 689), the conclusions of their valuation model “hinge on the extent to which the accounting is conservative as opposed to unbiased. Further, the absence/presence of growth in operating activities is relevant if, and only if, the accounting is conservative.” Accordingly, the use of Japanese data for validating the FO valuation model would allow us to better capture the valuation effect, if any, of accounting conservatism.

**Summary Results of the First Essay**

My results support that book value of equity and abnormal operating earnings are positively associated with prices. However, operating assets have a negative instead of positive impact on firm valuation. This implies aggressive accounting and deviates from the prediction of FO (1995) and common accounting practices, especially that Japanese accounting is well-known for its higher conservatism compared with the US (e.g., Cheung, Kim, and Lee; 2000). The negative result
may also be interpreted as investors do not perceive operating assets rationally. Alternatively, multicollinearity of book value and operating assets may drive the coefficient of operating assets negative. Converting the price model into a goodwill model reveals the positive valuation impact of operating assets.

In addition, evidence shows that the market places higher value on firms maintaining higher earnings persistence or adopting more conservative accounting practices but not on firms undergoing higher growth. Evidence also supports that, other things being equal, earnings persistence, but not growth, accentuates the valuation effect of accounting conservatism. The negative results associated with growth may be contributed by the inconsistent results obtained for the linear information model (LIM). Alternatively, they may be explained by growing firms having higher proportions of undepreciated new assets, thus mitigating the effect of conservatism on book values (Beaver and Ryan, 2000). On the other hand, the negative results may fit into the scenario of firms having negative growth. While the Japanese stock market boomed in the 1980’s, it experienced a sharp downturn from 1990 onwards. Inferred from Beaver and Ryan (2000), negative growth results in higher unrecorded goodwill.

Furthermore, inferred from Ryan (1995) and Beaver and Ryan (2000), an alternative measure of accounting conservatism based on the proportion of depreciable fixed assets gives results supporting the positive valuation effect of accounting conservatism. However, accounting conservatism inferred from the remaining useful lives of depreciable assets decreases rather than increases goodwill. This may be interpreted as follows. First, investors view companies
having assets with short remaining lives as more conservative because these firms depreciate asset costs faster. Second, long asset life firms have relatively higher proportions of new assets on hand which have book values equal to market values (Ryan, 1995), therefore their book values are relatively less understated. When investors perceive lower conservatism to be associated with longer asset life more (rather) than higher unrecorded goodwill resulted from longer remaining useful life for book values of assets to incorporate prior market value changes, then negative valuation effect of asset life will be observed.

Macroeconomic and industry variables added to proxy for the other non-accounting information in the FO (1995) valuation model induce some changes in the results. For instance, when year and industry dummies are included, the adjusted R-squares of the valuation models increase by 4% to 29%. This indicates that non-accounting information has incremental explanatory power beyond abnormal operating earnings and operating assets to explain the variation in unrecorded goodwill. Their inclusion also accentuates the valuation impact of operating assets but decreases the valuation impact of accounting conservatism. Moreover, valuation effect of operating assets no longer increases with the extent to which a firm adopts conservative accounting practices. Other than these changes, they do not significantly reverse the general trend of results. These negative results may be attributed to the failure of the linear information dynamics to precisely capture the effects of accounting conservatism and growth of operating assets. Consistent with the findings of Myers (1999) and Stober (1996), high proportions of the empirical estimates of the conservatism and growth parameters
in the linear information model fall outside their restricted bounds, which are part of the crucial assumptions of the FO linear valuation model.

Organization of the Thesis

This thesis consists of two essays, each essay reports on a separate but related research topic on firm valuation. The remaining of this thesis is structured as follows. Essay One: Chapter Two reviews the relevant literature in previous market-based accounting research. Chapter Three outlines the Ohlson (1995) and Feltham & Ohlson (1995) models, which provide theoretical foundations for the empirical testing. Chapter Four derives research hypotheses based on testable implications of the Feltham and Ohlson valuation model. Chapter Five introduces and explains the test methodology. Chapter Six reports and analyses the results. Chapter Seven gives the summary and conclusions. Essay Two: Chapter Eight introduces the motivation and objectives of the second study. Chapter Nine reviews relevant literature on discretionary accruals and the signaling effect on firm valuation, and the value-relevance of earnings and book values. Chapter Ten explains the research hypotheses derived with reference to Collins et al. (1999) and Subramanyam (1996). Chapter Eleven describes the test methodology. Chapter Twelve reports and analyses the results. Chapter Thirteen concludes and summarizes the findings.
CHAPTER TWO: LITERATURE REVIEW

Introduction

Since the seminal work of Ball and Brown (1968) and Beaver (1968), capital markets research largely documents the relationships between stock prices and accounting numbers. In particular, the extent to which reported earnings affect prices (cause price revisions), and thus contribute to providing useful information to investors for decision making, has been widely studied. These studies embrace the "informational perspective" which typically assumes that the capital market is efficient with respect to information so that share prices respond instantaneously to reflect all the available information released to the market. Accounting numbers are then evaluated by reference to their impact on stock prices (or price changes) for their information content (contribution). Accordingly, how accounting information contributes to explaining and determining the observed and future stock prices is not a primary concern of this line of research. This contrasts with the traditional financial accounting research which embraces the "measurement perspective" to measure how accounting information determines security value. This measurement approach in accounting evaluates accounting concepts underlying asset valuation and determines the investment worth of a business. Prior studies using accounting information in financial statements to determine the intrinsic value of firms provide empirical evidence contrary to the implications of efficient markets. For example, by comparing the market values and approximated intrinsic values of firms, one can systematically identify mispriced stocks in the market and construct profitable trading strategies. This implies that the market is

The Informational Perspective of Financial Reporting and Efficient Markets Hypothesis (EMH)

Under the informational perspective, stock prices are assumed to be efficient in reflecting all accounting information released to the market. This provides the base for accounting numbers, especially earnings, to be evaluated by reference to prices (and price changes) for their information content. Thus the behavior of security prices is justified as an operational test of earnings usefulness, as Ball and Brown (1968: p.160) point out:

"An impressive body of theory supports the proposition that capital markets are both efficient and unbiased in that if information is useful in forming capital asset prices, then the market will adjust asset prices to that information quickly and without leaving any opportunity for further abnormal gain...."\(^2\)

Similarly, Jensen (1978: p. 96) defines an efficient market as follows:

"A market is efficient with respect to information set \(\theta_i\) if it is impossible to make economic profits by trading on the basis of information set \(\theta_i\)."\(^3\)

\(^2\) See Ball and Brown (1968, p. 160, fn. 4) for references on unbiased market and random walk prices.

\(^3\) Economic profits are net of all costs including the storage costs of the good, transaction costs, and costs of obtaining information. They are calculated after the deduction of a market rate of return (interest) on capital. Price theory supports the proposition that in a world of certainty, competition drives economic profits to zero. The EMH extends this zero profits equilibrium condition to the dynamic behavior of prices in competitive markets under uncertainty.
The implications of the efficient market contradict the hypothesis prevailing in the early 1960's that accounting reports are the sole source of information. In the early 1960's, accounting literature was mainly normative, prescribing how firms should report. Accounting theorists then were more concerned with policy recommendations because they commonly hypothesized that corporate accounting reports were the only source of information on the corporation available to investors. Since managers are always closer to the information sources than investors, this information asymmetry together with the fact that managers are allowed flexibility in choosing alternative accounting procedures enable managers to manipulate the reported results opportunistically and mislead the stock market when accounting reports are the only information source. Thus managers can cause their companies' stock prices to increase (be overvalued) by inflating reported earnings. The result is that the stock market cannot discriminate between efficient and less efficient corporations and price their shares appropriately (Watts and Zimmerman, 1986: p. 19). This argument leads to the prescription that all firms should adopt the same accounting policies.

With earnings being calculated inconsistently among different firms, the assertion that earnings should measure changes in the value of a firm and hence stock prices

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4 Accounting literature evolved from a descriptive mode in the late nineteenth and early twentieth centuries to a normative approach in the mid 1900's before arriving at the current positive theory concept. See Watts and Zimmerman (1986) for a summary of such evolution.

5 See Ball (1972) for examples and a discussion of the hypothesis underlying the prescriptions in the early 1960s accounting literature.

6 See Foster (1986) Ch. 5 for examples.
are good signals for the allocation of resources may become inappropriate. It was alleged that earnings are meaningless figures.  

However, the EMH suggests that competition drives investors and financial analysts to seek information from various sources other than the accounting reports. Hence the market is able to see through the earnings figures and is not systematically misled. In an efficient market, stock prices are unbiased estimates of future stock values. Therefore if accounting earnings are empirically associated with stock prices or changes in stock prices, those earnings could be useful indicators of values or changes in values. This provides the theoretical foundation for the mainstream financial accounting research to study the relation between stock prices and accounting earnings as a key accounting issue (Watts and Zimmerman, 1986).

**Definition of Earnings Usefulness**

Since most capital market studies which examine the relation of prices/returns with accounting numbers assess the information contribution of earnings or earnings-related accounting measures, it is helpful to explain the definition of earnings usefulness here before summarizing their findings. Usefulness of earnings was equated with actual use by returns-earnings research pioneers. For example, Ball and Brown (1968: p. 161) state:

"An observed revision of stock prices associated with the release of the income report would thus provide evidence that the information reflected in income numbers is useful."

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7 Ball and Brown (1968, pp. 159-160 & fn. 1) explain and provide a list of references for this allegation.
Beaver (1968: p. 68) comments in a similar vein:

"The issue (the information content of earnings) is of major concern to the accounting profession because its outcome directly reflects upon the utility of the accounting activity."

According to the information (communication) theory, a message is said to convey information if it significantly changes the receiver's probability distribution of the concerned random variables and triggers an action. Also, information is useful only if its inclusion in the information set changes a decision (Williamson, 1982). Thus if a financial report or announcement causes a change in stock price or volume, the news is considered useful. This is the logic underlying the returns and earnings association studies and event studies which maintain that the capital market is efficient (Lev, 1989).

**The Usefulness of Earnings for Assessing Price Changes**

The FASB's "Conceptual Framework" identifies the major objective of financial reporting to be the facilitation of investors to predict future cash flows or stock returns. The FASB (1976: pp.3-4) reads:

"The principal role of financial reporting (is) to furnish the investor and lender with information useful to assess the prospective risk and returns associated with an investment"

Similarly, the FASB (1978: sec. 43) states:

"The primary focus of financial reporting is information about an enterprise’s performance provided by measures of earnings and its components. Investors, creditors, and others who are concerned with assessing the prospects for enterprise net cash inflows are especially interested in that information. Their interest in an enterprise’s future cash flow and its ability to generate favorable cash flows leads primarily to an interest in information about its earnings...."
Therefore, objectively reported accounting earnings should carry useful information for investors to assess a firm's value. If earnings is useful in explaining price changes, then larger price revisions will imply greater usefulness of earnings. Thus the correlation between earnings and stock returns or price revisions gives the relative usefulness of earnings. This means the coefficient of determination, $R^2$, of the regression of stock returns on earnings acts as a measure of the informational contribution of earnings to investors.\(^8\)

**Prior Studies on Relations Between Returns and Earnings**

Lev (1989) provides an extensive review of studies assessing the relations between stock prices and returns and accounting numbers (earnings in particular) in the past two decades. These studies typically adopt the so-called informational perspective of accounting and assume share prices revise instantaneously in response to all useful information released to the market. Evidence in general shows that the correlation between earnings and stock returns is very low, irrespective of the length of the returns window chosen. Studies narrowing the returns window to a few days around the earnings announcement to ensure that price changes reflect only news of reported earnings (i.e., earnings surprise) fail to increase the $R^2$ beyond the 5% level.\(^9\) The low correlation does not seem to be affected by the

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\(^8\) However, most returns-earnings studies emphasize on the slope (response) coefficient of the returns-earnings regression, not on $R^2$. This is because those studies aim to test specific hypotheses, such as the relationship between the response coefficient and earnings persistence, instead of targeting to directly assessing the usefulness of earnings.

\(^9\) For example, Hagerman et al. (1984) report an $R^2$ of 5% for a window of five days around the announcement of quarterly earnings. Wilson (1986), and Hughes and Ricks (1987) obtain $R^2$ of 2 to 5% using a two-days window.
specific choice of earnings expectation model or definition of residual returns. Widening the window will mitigate the effect of errors in estimating expected earnings. However, studies using medium to long windows ranging from three months to two years yield $R^2$ of 4 to 7% only.\textsuperscript{10} Time-series returns-earnings regressions examined by Lev (1989) do not yield higher $R^2$ than cross-sectional regressions. Individual studies (e.g., Collins and Kothari, 1989) occasionally report higher $R^2$ of up to 10%. By aggregating firms into portfolios, some studies report dramatically higher $R^2$ (e.g., Beaver, Lambert and Morse (1980) report $R^2$s ranging from 55 to 95%) but the information contribution of earnings remains low at the individual firm level.\textsuperscript{11}

Similarly, methodological refinements do not add significantly to the explanatory power of earnings on returns. Such refinements involve:

1. the inclusion, as explanatory variables, of various profitability ratios, current costs proxies, earnings-related items such as cash flow components, sales and expenses;
2. the use of improved earnings expectation models which move from Ball and Brown’s last year earnings to time-series expectation models and later to the analysts’ forecasts;
3. estimating residual returns in various ways, such as using market-model residuals and mean-adjusted returns;
4. identifying the precise earnings announcement date; and

\textsuperscript{10} For example, Hopewood and McKeown(1985), Beaver et al. (1980).

\textsuperscript{11} Patell (1989) explains that we should not worry about low $R^2$ at individual firm level because investors are often advised to hold diversified portfolios to diversify away individual firm’s nonsystematic risk.
5. reversing the regression variables with earnings as the dependent variable and returns the independent variable.\textsuperscript{12}

To conclude, the findings seem to be robust to the time periods examined, the variables included in the regression models and the test methodologies adopted. Lev (1989) suggests that the low correlation may be caused by the inter-temporal instability of the returns-earnings relation. He provides evidence on the over time fluctuations of estimated intercepts, slope coefficients and $R^2$, which is consistent with the earlier indirect evidence provided by Beaver, Clarke and Wright (1979), Beaver, Griffin and Landsman (1982), Rayburn (1986), and Bowen et al. (1987). Possible explanations for the time-series fluctuations include discount rate changes, changes in anticipated inflation and firms' production and investment decisions.

Although findings from prior research imply a low informational contribution of earnings to induce price changes, earnings are in fact widely used in practice by financial analysts to forecast the future performance of firms. Moreover, remuneration packages of senior management executives are often based on earnings and earnings-related accounting measures. Therefore, earnings are indeed much more useful than the prior research suggests. Lev (1989) provides three possible explanations for the low correlation found in prior research. First, there are various methodological shortcomings of prior studies. For instance, earnings would affect returns of firms differently, rendering the earnings response

\textsuperscript{12} See Lev (1989, Table 1) for a summary of the returns window length, regression variables and reported $R^2$ of a sample of research in 1980-88 on the relationship between earnings and returns.
coefficient not constant across firms or over time. There may be errors in estimating the expected earnings. The relationship between earnings and returns may be non-linear, etc. Secondly, management manipulations and accounting measurement and valuation biases may lead to the low quality of information content of reported earnings. Thirdly, investors may be irrational, they misinterpret information, overreact or ignore relevant information (inefficient market). I will discuss about studies which suggest that markets are inefficient in the next section.

The Measurement Perspective of Financial Reporting and Market Efficiency Anomalies

Under the measurement perspective, researchers examine the role of accounting fundamentals in determining the valuation of firm. While the “informational perspective” (Beaver, 1989) views accounting earnings as signals about future payoffs, i.e., dividends or cash flows, Penman and Sougiannis (1997), in accordance with the “measurement perspective”, identify earnings as an attribute to be forecasted by information rather than information about that attribute. Earnings is identified as having certain measurement properties that make it appropriate as a valuation target. Traditional “measurement perspective” views earnings as an addition to value while the balance sheet measures stock of values. This stream of research, known as fundamental analysis, has been practised for decades without any unifying theoretical framework. There is also little empirical evidence in support of the analysis methods employed (Bauman, 1996). During the past two to three decades, traditional fundamental analysis and accounting measurement
theory have not been developed far from the traditional dividends discount concept or cash flows discount concept (Penman, 1992). Current interest in fundamental analysis can be traced to three leading papers in the 1980's. Lev and Ohlson (1982) identify the need for development of equity valuation models to supplement and extend the traditional correlation studies of market-based accounting research. Lev (1989) calls for the need to shift capital markets research towards measurement and valuation issues. Bernard (1989) critically reviews empirical research in fundamental analysis and suggests future research on additional formal modeling and on firms in a specific industry or economic sector.

Recently, Ohlson (1995) and Feltham and Ohlson (1995), drawing on the work on Preinreich (1938) and Edwards and Bell (1961), revive and advance the accounting measurement theory by developing an equity valuation model which explicitly links firm value with accounting fundamentals, based upon few restrictive assumptions in addition to the clean surplus relation. Also, market efficiency is not a necessary condition for the model. Adapting from the FO model, Penman and Sougiannis (1997) provide evidence that earnings calculated according to the US Generally Accepted Accounting Principles (GAAP) can serve as a substitute for dividends in equity valuation. Bernard (1995) obtains results strongly supporting the fundamental valuation model, using Value Line forecasted earnings and dividend data. Despite several restrictions and the use of only a four-year forecast horizon, the Value Line forecasts explain 68% of the variation in observed stock prices. When a forecast of the P/B ratio at the end of the four-year horizon is included as an additional regressor to reflect abnormal earnings beyond four years, an average R-square of 80% is produced. This testifies the power of accounting
data to reflect value well even over relatively short horizons. On the contrary, when price is regressed on forecasted dividends over the next four years, an average R-square of 29% is obtained. Bernard thus concludes that finite-horizon earnings are much more useful indicators of value than finite-horizon dividends.

On the other hand, studies of the role of accounting rate-of-return (return on equity: ROE) in equity valuation meet with mixed success. For instance, among the findings of Penman (1991) are: (1) ROE is positively, but weakly, associated with contemporaneous stock returns. (2) While ROE is mean reverting, current ROE is, on average, indicative of future ROE. (3) Current ROEs are positively related to current P/B ratios. (4) ROE is informative about the transitory nature of earnings and appears to be correlated with non-earnings information that predicts future profitability. However, as opposed to Penman's findings, Bernard (1994) concludes that current P/B ratios do not provide additional information about future ROEs beyond that contained in current ROEs. In fact, evidence reveals that current P/B ratios are less accurate than current ROEs in predicting future ROEs. This leads Bernard to the conclusion that the large variation in observed P/B ratios cannot be explained by differences in future ROEs. Instead, it can be partly explained by the future growth in book value and the gains/losses caused by cessation of non-surviving firms.

Recently there emerges a growing body of research that adopts the measurement approach and it provides empirical evidence that is inconsistent with the implications of market efficiency (market efficiency anomalies). Examples include Bernard and Thomas (1989), Ou and Penman (1989), Holthausen and Larcker
(1992), Fairfield and Harris (1993), Chung and Kim (1994, 1997b), Frankel and Lee (1998), and Cheung, Chung and Kim (1997). These studies document that one can construct profitable trading strategies based on information published in financial statements. By adopting valuation models which relate firm value to accounting numbers such as earnings, book values and cash flows, the intrinsic values of firms are estimated and compared with their observed market prices. Then based on whether the shares are currently over or undervalued, it is shown that one can construct profitable trading strategies by taking a long (short) position in shares that are currently undervalued (overvalued). This reflects that the market is inefficient and that current prices do not fully capture all information that is publicly available in the market.

The Ohlson/Feltham and Ohlson Framework

The studies of Ohlson (1995) and Feltham and Ohlson (1995) significantly influence capital market studies in recent years. Bernard (1995) comments that, since the late 1960's, research studies adopting the informational perspective developed without emphasizing the precise structure of the relation between firm valuation and accounting data. Ohlson/FO redirect our focus on this structure by developing an equity valuation model that relates firm value to accounting numbers. In short, their model expresses firm value in terms of the sum of two summary accounting measures: book value of equity (a stock measure of firm value) and the present value of expected abnormal earnings (a flow measure of firm value). This line of accounting research enhances our understanding of fundamental analysis, which assesses a company’s business activities and
prospects in order to estimate its market value. Their studies lead researchers to shift efforts from explaining stock price behavior to predicting stock prices based on future (abnormal operating) earnings and future growth in book value (of operating assets). The above-mentioned contributions provide important empirical implications.

Following from FO (1995), FO (1996) examines how depreciation policy influences the relation between the resulting accounting numbers and the market value of a firm. They demonstrate that, under uncertainty and with zero net present value investments, a proper depreciation policy provides two accounting measures (book value and accounting earnings) that are complements in valuation rather than substitutes. Specifically, market value equals a simple weighted average of book value and capitalized earnings minus current net cash flows. Moreover, firm value can be expressed as the book value plus abnormal earnings scaled by a constant explaining unrecorded goodwill. Since empirical tests of this thesis are framed within the context of FO (1995), I will discuss the valuation models of Ohlson (1995) and FO (1995) in details in the next chapter.

Usefulness of the Ohlson/Feltham and Ohlson Framework for Empiricists

FO provide a well-defined valuation model in terms of observable accounting numbers. Empiricists can conveniently apply it for empirical modeling while no implausible assumptions, especially those relating to dividends and earnings are required. For example, Lee (1996) uses the Ohlson (1995) model to estimate the intrinsic value of Timberland Inc. and concludes that the model is a good primary filter for identifying over or under-valued firms. Gopalakrishnan (1994) adapts the
Ohlson (1991) model to examine the value-relevance of pension liabilities and assets recognized in the balance sheet as opposed to being disclosed in the footnotes. Ohlson’s approach is chosen because it mitigates the problem of measurement errors in the independent variables, and is less likely to suffer from multicollinearity problems found in other valuation models such as Barth (1991).

In addition, the Ohlson/FO models give valuable insights into the meaning and determinants of financial ratios such as price-earnings ratio, price-to-book ratio (P/B) and return on equity (ROE). For instance, Penman (1991) concludes that ROE is more a profitability than a risk measure, and contributes to explaining the change in unrecorded goodwill. Ou and Penman (1994) and Bernard (1994) report that ROE is mean-reverting over time and that current P/B is positively related to current ROE. Cheung, Chung and Kim (1996), Chung and Kim (2000), and Chung and Kim (1997b) report similar results using Hong Kong and Korean samples, respectively.

**Practical Applications of the Feltham and Ohlson Model**

FO’s idea is increasingly adopted in practice. For example, the Stern-Stewart Economic Value Added (EVA) valuation technique relies on FO’s abnormal earnings concept to assess a company or division’s performance.\(^{13}\) EVA at time \(t\) is defined as: \(\text{EVA}_t = \text{earnings}_t - r \times \text{capital}_{t-1}\), where \(\text{earnings}_t\) is the actual earnings in period \(t\), \(r\) is the cost of capital, and \(\text{capital}_{t-1}\) is the net assets employed at the beginning of period \(t\). The equation relates wealth creation to abnormal earnings generation. A positive EVA means that wealth is generated

\(^{13}\) See Stewart 1991, especially Ch. 8 for details.
since actual earnings exceed the expected return on capital, i.e., the expected level of performance. Some large US firms such as Coca-Cola, AT & T and Quaker Oats have used EVA to evaluate management performance (Tully, 1993). EVA is more suitable than the traditional earnings-based performance measures since managers are now held accountable not only for the earnings generated, but also for the amount of capital they employ.
EQUITY VALUATION MODELS

Ohlson's (1995) Equity Valuation Model

Accounting can be viewed as a system of aggregating value or value accretion in the production economy. Through the aggregation process, an accrual accounting system eventually produces two different summary measures of firm value, that is (1) book value of equity, a stock concept of value, and (2) periodic earnings, a flow concept of value. It is well known that, due to the fundamental nature of double-entry bookkeeping system, the change in book value of equity (i.e., change in stock value) must be equal to earnings adjusted for dividends and capital contributions (i.e., flow value) (Ijiri, 1975, 1982, 1989). This is indeed the nature of what Ohlson calls the 'clean surplus relation'. Ohlson's (1995) accounting valuation model relies upon the very nature of accounting aggregation process and explains how a firm's equity value is linked to the two most important products of accounting aggregation process, namely book value and accounting earnings. In what follows, I outline Ohlson's model to the extent that it is relevant to the current research.

Ohlson's model begins with the non-controversial dividend capitalisation formula, denoted by the present value of expected dividends (PVED), given in equation (1) below. Assuming that investors are risk neutral, the market value of a firm is

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14 The clean surplus relation can also be interpreted in such a way that accounting earnings include all gains or losses that affect shareholders' equity.
assumed to be the present value of expected dividends, discounted at the risk-free rate:

\[ P_t = \sum_{r=1}^{\infty} R_f^{-r} E_t(d_{r,t}) \quad \text{(PVED)} \]

where \( P_t \) = the market value or price of the firm at time \( t \);

\( d_t \) = the dividends paid for the period \( t \) (negative \( d_t \) is interpreted as capital contributions);

\( R_f \) = the risk-free interest rate plus one;

\( E_t(\cdot) \) = the expected value operator conditioned on the date \( t \) information.

Under the clean surplus relation, the following relation must hold:

\[ y_t - y_{t-1} = x_t - d_t \]

where \( y_t \) = book value of equity at time \( t \);

\( x_t \) = earnings for the period \( t \).

Let abnormal earnings \( (x_t^a) \) be defined as:

\[ x_t^a = x_t - (R_f -1)y_{t-1} \]

Abnormal earnings, which is often called "residual income" or "economic value added" (EVA), is accounting earnings net of the cost of using capital to generate
earnings.\textsuperscript{15} Note that from Eq. (2) and (3), the dividends paid for the period \( t \) \((d_t)\) can be expressed as follows:

\begin{equation}
(4) \quad d_t = x_t^a + R_f \cdot y_{t-1} - y_t
\end{equation}

By substituting Eq. (4) into Eq. (1), Ohlson obtains the following valuation model which links the market value of the firm with the two fundamental accounting measures, that is book value and abnormal earnings (which depends on book value and earnings):

\begin{equation}
(5) \quad P_t = y_t + \sum_{r=1}^{\infty} R_f^{-r} E_t(\bar{x}_{t+r})
\end{equation}

provided that a regularity condition is satisfied (i.e., \( \lim_{r \to \infty} [E_t(\bar{x}_{t+r}) / R_f^{r}] = 0 \)).

Eq. (5) states that the market value of the firm is the sum of the book value and the present value of a stream of expected future abnormal earnings. Eq. (5) indicates that a firm’s market value could be greater (less) than book value if earnings in the future periods are, on average, greater (less) than the corresponding cost of using capital to generate earnings [i.e., \((R_f - 1) y_{t-1}\)].

Ohlson’s valuation model in (5) was originally presented in Preinreich (1938), and Edwards and Bell (1961), but has been largely ignored in the accounting literature. In this regard, Bernard (1995: pp. 741-742) states that: “the direct link between future accounting numbers and current value seems to have been lost on the capital markets.

\textsuperscript{15} The practical importance of utilizing the EVA concept for strategic management and performance evaluation has recently been much emphasized. For more details on this issue, see three recent articles in Fortune by Tully (1993,1994) and Walbert (1993).
literature of the last 25 years." Similarly, Lundholm (1995: p.751) considers that "its revival constitutes a major contribution to modern financial accounting".

Although there are studies which relate prices and earnings, using also the dividend discount model, they invariably impose more restrictive assumptions on the relations between earnings and dividends/cash flows than the Ohlson (1995) model. For example, Collins and Kothari (1989) and Beaver, Lambert and Morse (1980) assume dividends are proportional to earnings. Kormendi and Lipe (1987) assume that the present value of the contemporaneous change in expected earnings equals the present value of any change in expected cash flows. Fama and Miller (1972) assume that earnings equal to net operating cash flows.

Feltham and Ohlson's (1995) Model

Feltham and Ohlson (1995: hereafter FO) have extended the Ohlson (1995) model by decomposing a firm's book value of net assets into net assets related to financial and operating activities (i.e., financial assets and operating assets) within the context of clean surplus relation. The model uses the concepts of net assets (assets net of liabilities) and net dividends (dividends minus capital contributions). Examples of (net) operating assets include fixed assets net of depreciation, prepayments, accounts receivables, and inventory, net of operating liabilities such as accounts payables and accrued liabilities. Examples of (net) financial assets include cash and marketable securities, net of interest-bearing debts like bills payables, debentures and bonds. For financial activities, book value equals market value because relatively perfect markets exist for the assets and liabilities involved.
In contrast, operating assets and liabilities are typically not individually traded in perfect markets and their accounting values are determined through accrual accounting measurements. This leads to differences between book values and market values. The difference is typically referred to as unrecorded goodwill.

Assumptions Underlying the Feltham and Ohlson Model

Consistent with Ohlson (1995), FO also begin with the dividend discount model (more precisely named as the present value relation [PVR] in FO) and the clean surplus relation (CSR), and introduce some additional accounting relations:

1. The Net Interest Relation (NIR) - The model permits only cash dividends and cash capital contributions (negative dividends). Interest rate at time t is assumed to be the same for both financial assets and liabilities. The following net interest relation is assumed:

\[ i_t = (R_f - 1)fa_{t-1} \]  \hspace{1cm} (NIR)

where \( i_t \) is interest revenues, net of interest expenses, for period (t-1, t); \( R_f \) is the risk-free rate plus one; and \( fa_{t-1} \) denotes net financial assets (total financial assets net of total financial liabilities) at time t-1.

NIR reflects that the firm has zero net present value return on its net financial assets. It implies that the book values equal market values for all financial assets at any time. This is similar to thinking of risk-free financial assets and liabilities as trading in perfect markets.
2. *The Financial Assets Relation (FAR)* - Financial assets at beginning period \( (f_{a_{t-1}}) \) earn interest \( (i_t) \) during the period. If dividends \( (d_t) \) are paid and cash from operating activities \( (c_t) \) is received at the period end, then the ending financial assets \( f_{a_t} \) would be given by the financial assets relation:

\[
\begin{align*}
    f_{a_t} &= f_{a_{t-1}} + i_t - [d_t - c_t] \\
    \text{FAR}
\end{align*}
\]

The dividends minus cash flows from operations \( (d_t - c_t) \) directly reduce the ending financial assets balance, but do not influence the interest earned during the period (FO, 1995: p. 695).

3. *Operating Assets Relation (OAR)* - Operating assets \( (oa) \) include all assets and liabilities that do not generate earnings according to the NIR. Operating earnings \( (ox) \) consist of all non-interest earning (bearing) items, examples include sales, cost of goods sold, general, selling and administrative expenses, and gains and losses on disposals of operating assets. Since the firm’s activities are either financial or operating, CSR and FAR imply the following operating assets relation:

\[
\begin{align*}
    o_{a_t} &= o_{a_{t-1}} + o_{x_t} - c_t \\
    \text{OAR}
\end{align*}
\]

Operating activities employing net operating assets \( (o_{a_{t-1}}) \) at the start of the period generate operating earnings \( (o_{x_t}) \) during the period, transfer cash flows \( (c_t) \) to the financial assets at the period end, leaving net operating assets \( (o_{a_t}) \) at period end. The difference between cash flows and operating earnings reconciles with the balance sheet accruals. No dividend term appears in the OAR, indicating that the valuation of operating activities is independent of dividend policy.

4. *Present Value Relation (PVR)* - The market value of a firm \( (P_t) \) is assumed to equal the present value of expected dividends discounted at the risk-free rate:
(9) \[ P_t = \sum_{r=1}^{\infty} R_f^{-r} E_t(\tilde{d}_{i,r}) \] (PVR)

This is the same as the PVED in Ohlson (1995), renamed in line with other relations introduced above.

**Relation of Value to Future Accounting Data and Operating Cash Flows**

Using CSR, NIR, FAR, OAR and PVR, FO obtain the following results (see their Proposition 1):

(10) (a) \[ P_t = fa_t + \sum_{r=1}^{\infty} R_f^{-r} E_t(\tilde{c}_{i,r}) \]

(b) \[ P_t = bv_t + \sum_{r=1}^{\infty} R_f^{-r} E_t(\tilde{\tilde{x}}_{i,t+r}) \]

(c) \[ P_t = bv_t + \sum_{r=1}^{\infty} R_f^{-r} E_t(\tilde{a}_{i,t+r}) \]

All future terms in the above equations are ex-ante unobservable at time t, therefore the above models are not predictable in nature. To facilitate empirical modeling, I have to convert the variables into observables. FO introduce a dynamic linear information model to relate firm value to observable current accounting information. This will be discussed later in this chapter.

**Relation between Goodwill and Abnormal Earnings**

Relation (10b) [Proposition 1(b)] can be rewritten to introduce the concept of (unrecorded) goodwill, which is defined as:

\[ g_t = P_t - bv_t \]

(11) \[ g_t = \sum_{r=1}^{\infty} R_f^{-r} E_t(\tilde{\tilde{x}}_{i,t+r}) \]
Companies adopting different accounting methods may report different book values for the same assets, hence the amount of unrecorded goodwill at any time depends on the accounting principles employed. However, as Preinreich (1938) and later Peasnell (1982) point out, the analysis that leads to relation (11) and Proposition 1 (b) remains valid for all accounting principles that follow the CSR.

**Unbiased Vs Conservative Accounting For Operating Assets**

In the FO framework, goodwill is solely attributable to the accounting for operating assets. This is because the market value of financial assets equals the associated book value, and the NIR dictates that financial activities earn zero abnormal gains. Proposition 1 (c) subsumes the Miller and Modigliani (MM: 1961) separation property. This implies that the market value of equity equals the values of financial activities and operating activities added separately, or mathematically:

\[
P_t = fa_t + oa_t + g_t
\]

Therefore, the value of operating activities is:

\[
P_t - fa_t = oa_t + g_t = \sum_{t=1}^{\infty} R_f^{-t} E_t[\tilde{c}_{t+1}]
\]

FO define accounting as unbiased if the expected difference at date t between future price and future book value (expected future goodwill at time t) eventually becomes zero as \( t \to \infty \):

\[
E_t[\tilde{c}_{t+1}] = E_t[P_{t+1} - bv_{t+1}] \to 0 \quad \text{as} \quad t \to \infty
\]

and accounting as conservative if the expected future goodwill at time t, as \( t \to \infty \), is greater than zero:

\[
E_t[\tilde{c}_{t+1}] = E_t[P_{t+1} - bv_{t+1}] > 0 \quad \text{as} \quad t \to \infty
\]
From relation (13) and the definitions of unbiased and conservative accounting, FO derive Proposition 2 which states that unbiased (conservative) accounting occurs if, on the average, \( \alpha \), equals (is smaller than) the present value of future cash flows, or if, on average, the present value of anticipated abnormal operating earnings equals (is greater than) zero.

Lundholm (1995) finds it more empirically useful to modify the above definition to identify the number of periods in the future that are necessary for the expected future goodwill to become zero. For example, the accounting is unbiased 5 periods ahead if \( E_0 (P_5 - bV_5) = 0 \). This definition is more useful since one can compare accounting systems to see which is more conservative (takes a longer time to become unbiased).

**Dynamic Linear Information Model**

In an attempt to express the valuation relation in Proposition 1(c), FO introduce the so-called dynamic linear information model (LIM) which links future (unobservable) accounting and non-accounting variables with current (observable) accounting and non-accounting variables. The LIM focuses on operating activities and assumes that abnormal operating earnings and the book value of operating assets form part of the sufficient statistics representing investor information (p.701).
Assuming the evolution of all information follows a linear Markovian structure, and restricting the other information to two random numbers: \( \nu_i = (\nu_u, \nu_v) \), FO introduce the following recursive equations (p. 702):

\[
\begin{align*}
\delta x_{t+1}^a &= \sigma_{11} \delta x_t^a + \sigma_{12} o a_t + \nu_{1t} + \varepsilon_{1t+1} \\
\delta a_{t+1} &= \sigma_{22} o a_t + \nu_{2t} + \varepsilon_{2t+1} \\
\tilde{\nu}_{1t+1} &= \gamma_1 \nu_{1t} + \varepsilon_{2t+1} \\
\tilde{\nu}_{2t+1} &= \gamma_2 \nu_{2t} + \varepsilon_{4t+1}
\end{align*}
\]

Note in the above that \( \sigma_{11}, \sigma_{12}, \) and \( \sigma_{22} \) capture the degree of persistence of abnormal operating earnings, accounting conservatism, and growth in operating assets, respectively.

Further, FO impose the following restrictions on the LIM parameters:

1) \( |\gamma_h| < 1, \ h = 1, 2 \)

This ensures that the random events influencing other information have no long run effect on future other information.

2) \( 0 \leq \sigma_{11} < 1 \)

This restricts the marginal persistence in abnormal earnings. It eliminates implausible oscillating persistence but implies the marginal effect of persistence decays geometrically with time.

3) \( 1 \leq \sigma_{22} < R_f \)

This restricts the long run growth in operating assets. The lower bound rules out asymptotic liquidation of the firm's operations while the upper bound eliminates growth paradoxes.

4) \( \sigma_{12} \geq 0 \)
This represents the dichotomous possibilities of unbiased accounting ($\sigma_{12} = 0$) and conservative accounting ($\sigma_{12} > 0$).

Based on the LIM, FO obtain the following valuation models which establish contemporaneous relation between current price and current accounting variables:

(14) \[ P_t = b v_t + \alpha_1 ox_t^a + \alpha_2 oa_t + \beta_t \cdot v_t \]

where

- $P_t$ = market value of firm at time $t$
- $bv_t$ = book value of equity at time $t$
- $ox_t^a$ = abnormal operating earnings at time $t$
- $oa_t$ = abnormal (net) operating assets at time $t$
- $v_t$ = other non-accounting information available at time $t$

\[ \alpha_1 = \frac{\sigma_{11}}{R_f - \sigma_{11}} \quad \alpha_2 = \frac{\sigma_{12} R_f}{(R_f - \sigma_{22})(R_f - \sigma_{11})} \]

\[ \beta = (\beta_1, \beta_2) = \left[ \frac{R_f}{(R_f - \sigma_{11})(R_f - \gamma_1)} \frac{\alpha_2}{(R_f - \sigma_{22})(R_f - \gamma_2)} \right] \]

\[ R_f = 1 + r_f \quad r_f = \text{risk-free rate} \]

Or alternatively, for unrecorded goodwill, $g_t$:

(15) \[ g_t = P_t - bv_t = \alpha_1 ox_t^a + \alpha_2 oa_t + \beta_t \cdot v_t \]

The valuation function in equation (14) or (15) provides the basis for the current empirical testing. Equation (14) states that the market value of the firm is a positive function of book value, abnormal operating earnings, operating assets and other information. It further implies that the valuation effect of abnormal operating earnings ($\alpha_1$) is positively affected by earnings persistence ($\sigma_{11}$) while the
valuation effect of operating assets ($\alpha_2$) is positively affected by earnings persistence ($\sigma_{11}$), accounting conservatism ($\sigma_{12}$) and growth ($\sigma_{22}$).

The Impact of Earnings persistence, Conservatism and Growth on Equity Value

Proposition 4 of FO shows that when there is no persistence in operating abnormal earnings (i.e., $\sigma_{11} = 0$), $P_t$ depends only on $fa_t, oa_t$ and $\nu_t$:

$$P_t = fa_t + k_2 oa_t + \beta \nu_t$$

where

$$k_2 = 1 - k + \alpha_2$$

$$k = \frac{\sigma_{11}}{R_f - \sigma_{11}} \in (0,1)$$

Since $k = 0$ here, $k_2$ simply equals $1 + \alpha_2$. In this extreme case, current earnings are not value-relevant, except for their updating effect on $fa_t$ and $oa_t$. Therefore, current earnings, and on average, aggregate earnings do not play significant roles in the prediction of future operating earnings.

As shown in their Proposition 5, when there is growth in operating assets, the firm’s expected value and earnings increase over time, but value grows at a rate faster than earnings only for conservative accounting. The latter holds even if there is positive persistence in abnormal earnings (i.e. $\sigma_{11} > 0$). In fact as $\sigma_{11}$ increases, the differential growth rates between value and earnings increase, given conservative accounting and growth in operating assets. Therefore, the effect of
accounting conservatism and growth on the price earnings relation is accentuated by high abnormal earnings persistence.\textsuperscript{16}

Further, FO demonstrate that with no growth, conservatism causes a finite positive expected abnormal earnings but gives an unbounded positive expected abnormal earnings with growth (see their Proposition 6). That means growth accentuates accounting conservatism. When growth in assets is accounted for conservatively so that there are biases in price relative to both book value and earnings, unrecorded goodwill grows exponentially.

\textsuperscript{16} For mathematical notation and proof, see Feltham and Ohlson, 1995, p. 710 & appendix.
CHAPTER FOUR: RESEARCH HYPOTHESES

Statements of Main Hypotheses

The FO valuation function in (14) indicates that the market value of the firm is a positive function of book value of equity, abnormal operating earnings (unless a firm's earning series have zero persistence) and operating assets (unless accounting is unbiased). This leads to the first hypothesis:

\[ H1: \text{The market value of the firm at time } t \text{ is a positive function of book value of equity at time } t, \text{ abnormal operating earnings in period } t \text{ and operating assets at time } t. \]

The FO valuation function in (14) further indicates that the effect of abnormal earnings on firm value is accentuated as the persistence of abnormal operating earnings increases. This is because the more persistent the earnings series, the higher the multiple the market will attach to the reported abnormal earnings. Barth, Beaver and Landsman (1992), among others, provide evidence that the transition asset amortization coefficient is lower than other pension coefficients, and is insignificantly different from zero. This is consistent with the expectation that investors place higher value on those earnings components that are largely permanent, such as service costs and interest costs components of the pension costs, than on earnings that are partly transitory.\(^\text{17}\) Similarly, Cheng, Liu and Schaefer (1996) provide evidence to suggest that the incremental information

\(^{17}\) See Statement of Financial Accounting Standards No. 87 (SFAS 87), *Employers' Accounting for Pensions* for the definition and nature of the components of pension costs.
content of accounting earnings decreases with a decrease in the permanence of earnings. To test for the relation between the valuation effect of abnormal operating earnings and earnings persistence, it is hypothesized that:

\[ H2: \text{Other things being equal, the effect of abnormal operating earnings on the market value of the firm increases with the strength of the persistence of a firm's abnormal operating earnings.} \]

The FO valuation function in (14) also indicates that the effect of operating assets on the market value of the firm becomes more pronounced when a firm uses conservative accounting practices and when a firm's operating assets grow over time. It is well known that accounting practices are more conservative for Japanese firms than for US firms. Bildersee et al. (1990) report, for example, that Japanese firms are required to use accelerated depreciation for both tax and financial reporting purposes. While US firms normally use straight-line depreciation in their financial statements, Japanese firms typically use accelerated depreciation for both tax and financial reporting. Cheung, Kim and Lee (2000) find that the magnitude of the earnings response coefficient is greater for Japanese firms than for US ones, reflecting more conservative Japanese accounting practices.

In my study, I interpret conservatism broadly as the adoption of accounting methods that lead to lower reported earnings and net asset values (e.g., Belkaoui, 1985; Davidson et al., 1988). Basu (1997) interprets conservatism in a different perspective: conservatism calls for a higher degree of verification to recognize good news as gains than to recognize bad news as losses. This interpretation results in earnings reflecting 'bad news' more quickly than 'good news'. The
greater timeliness of earnings to reflect bad news implies that current earnings are more sensitive to negative returns (proxying bad news) than positive returns (proxying good news). Consistent with his prediction, Basu finds that current earnings are two to six times more sensitive to negative returns than positive returns. Moreover, he provides evidence that the more timely recognition of bad news through accruals results in greater timeliness of earnings relative to cash flow (Dechow 1994). He also predicts and finds that, consistent with Hayn (1995) and Collins et al. (1999), positive earnings changes are more persistent (have higher earnings response coefficients) than negative earnings changes, given that conservatism results in losses being anticipated in earnings more quickly than gains.

Recently Ball and Robin (1999) extend Basu’s results to seven non-US countries and show that Australia, Canada, the UK and US (common-law countries) display greater conservatism than Japan, Germany and France (code law countries). They classify common-law countries as those have accounting standards originated and enforced via civil actions such as contractual penalties and litigation. On the other hand, accounting standards in code-law countries are set and enforced via criminal actions such as fines and imprisonment. Using the same seven countries, Ball, Kothari and Robin (2000) provide evidence that common-law accounting income exhibits significantly greater timeliness than code-law accounting income. Early incorporation of economic losses restricts managers from opportunistically managing income-increasing accruals to report higher earnings and maximize their own remuneration. Therefore, conservative accounting facilitates monitoring of managers and is important in common-law corporate governance.
Similarly, Ball, Wu and Robin (2000) study the timeliness and conservatism of earnings in four East Asian countries, namely Hong Kong, Malaysia, Singapore and Thailand. They find that earnings in these countries are relatively less timely and conservative. They conclude that, other than formal accounting standards, institutional factors such as family-ownership, the relative role of public debt vs. commercial bank lending, the cost of stockholder litigation, etc., contribute to the differential earnings properties of these countries, compared with their western counterparts. Hence one should look beyond the formal accounting standards to the underlying political and economic environment to assess accounting information.

Since conservatism modeled in FO does not take the specific interpretation of Basu (1997), I adopt the broader interpretation of conservatism, as discussed earlier, in my study. To provide empirical evidence on the valuation effect of accounting conservatism and growth, the following hypotheses are developed:

\[ H3: \text{Other things being equal, the effect of operating assets on the market value of the firm increases with the extent to which a firm adopts conservative accounting practices.} \]

\[ H4: \text{Other things being equal, the effect of operating assets on the market value of the firm increases with the extent to which a firm's operating assets grow over time.} \]

FO demonstrate that the valuation effect of accounting conservatism is accentuated for a growing firm. Further, Beaver and Ryan (2000) provide evidence that accounting conservatism and delayed recognition of market value shocks by accrual accounting process have different implications for the ability of the book-
to-market ratio (B/P) to predict the book return on equity (ROE). They predict and empirically demonstrate that the B/P consists of two components. One component is due to conservatism\(^{18}\), which causes the differences in the B/P and ROE to persist and not converge over time. The other component is due to delayed recognition\(^{19}\), which causes both the B/P and ROE to converge towards an overall economy-wide average over time. Like FO, Beaver and Ryan argue that the effect of accounting conservatism on earnings is accentuated for a growing firm. Moreover, higher growth accentuates the effect of conservatism on net income relative to its effect on book value, so ROE falls with firm growth if accounting is conservative. They provide evidence to show that there exists a strong negative association between conservatism and future ROE for low to median growth firms, which is consistent with their above argument.\(^{20}\) However, for the high growth firms, there is no association between accounting conservatism with future book return on equity. They provide possible explanation that the percentage effects of conservatism on net income and the book value being roughly the same for that group of firms studied, which may have growth approximately equal to the internal rate of return (IRR). To provide empirical evidence on the interaction effect of

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18 Beaver and Ryan (2000) use the term “biased recognition” to describe the conservative valuation of existing assets and liabilities and the non-recognition of expected future positive net present value prospects. They characterize biased recognition through differential economic and accounting exponential depreciation rates.

19 Delayed recognition refers to the delayed recognition in book values of market value shocks such as unrealized gains and losses over the remaining life of assets and liabilities under historical cost accounting. Delayed recognition implies that the B/P differs from one whenever holding gains and losses are not recognized in full immediately. However, the B/P tends to converge back to one over the effective period of recognition of the holding gains or losses. Example of such an effective period is the useful life of a fixed asset.

20 Conservatism is represented by the residual term in the research model used by Beaver and Ryan (2000). The more negative the residual term means the higher the conservatism.
accounting conservatism and growth on the market value of the firm, I further hypothesize that:

\[ H5: \text{Other things being equal, the higher the growth in a firm's operating assets is, the higher is the valuation effect of accounting conservatism.} \]

FO show that accounting conservatism and growth have more pronounced effects on the price-earnings relation when the persistence in abnormal earnings is higher (see their Proposition 5). They further demonstrate that, with no growth, conservatism causes a finite expected abnormal earnings but gives an unbounded expected abnormal earnings with growth (see their Proposition 6). To further examine whether earnings persistence and accounting conservatism interactively affect the valuation relation among them, the following hypothesis is tested:

\[ H6: \text{Other things being equal, the higher the persistence in a firm's operating earnings is, the higher is the valuation effect of accounting conservatism.} \]

**Additional Hypotheses**

The FO (1995) valuation model is silent on the issue of what determines accounting conservatism. However, Ryan (1995) and Beaver and Ryan (2000) provide evidence that the magnitudes of unrecorded goodwill arising from accounting conservatism and delayed recognition of market value shocks (unrealized gains and losses) are larger, other things being equal, for firms holding a higher proportion of depreciable fixed assets relative to total assets and/or holding depreciable fixed assets with longer remaining useful lives. Ryan (1995) examines the ability of current and lagged market value changes to explain the
B/P. Results indicate that market value changes predict the B/P more strongly and over a longer period for firms with longer lived assets.

In his study, Ryan assumes that when fixed assets are acquired and retired, their market and book values are the same. Under accrual accounting, unrecorded goodwill, the difference between market and book values, arises partly from the smoothing and/or delayed recognition of market value changes of assets during their useful lives. Many attributes of accrual accounting, such as historical cost accounting, smooth the incorporation of market value shocks into book values over the remaining useful life of assets. Other attributes, such as the recognition of gains and losses only upon realization, delay the incorporation of market value shocks into book values without smoothing. Ryan assumes that the delayed recognition follows a moving average process to reflect the mean-zero market value shocks occurring after the acquisition of assets. The two above-mentioned assumptions imply that unrecorded goodwill (the B/P) mean reverts to zero (one) over the remaining useful life of assets.

To provide further evidence on the valuation effect of accounting conservatism, I test the following hypotheses:

\(H7:\) The valuation effect of accounting conservatism is more (less) pronounced for firms with the higher (lower) proportion of depreciable fixed assets.

\(H8:\) The valuation effect of accounting conservatism is more (less) pronounced for firms with a longer (shorter) useful life of depreciable fixed assets.
CHAPTER FIVE: TEST METHODS

Data and Sample Selection

The initial sample for the study consists of all non-financial firms that were listed on the Tokyo Stock Exchange for the period 1975 to 1995. Relevant data are extracted from the 1996 Pacific-Basin Capital Markets (PACAP) databases for Japan, which contain daily stock prices and returns, market and industry indices and returns, various macro-economic statistics such as interest rates, and company financial statements covering the period of January 1, 1975 to December 31, 1995. The sample period is divided into two sub-periods: the linear information model (LIM) estimation period (1975 to 1989) and the Feltham and Ohlson (FO) equity valuation model estimation period (1990 to 1995). Since lagged values of book equity are required for estimating abnormal operating earnings in the FO model, to provide sufficient data for time series analysis, firms with financial statement data first available in PACAP on or after 1990 are eliminated. In addition, market capitalization and market return have to be available between 1990 to 1995. Similarly, to strike a balance between the reliability and sufficiency of data for estimating the LIM, book equity value, operating income, and net operating assets must be available for at least 7 of the 15 years from 1975 to 1989, inclusive, before a company is included in the sub-sample. Firm-years with negative equity values are eliminated. The 1% most extreme observations are winsorised to avoid their undue influence on the regression results.

21 Following Bae & Kim (1996), Cheng & Hsu (1996), and Myers (1999), etc., I exclude firms in the financial service industry since the information dynamics and economic meanings of accounting values used in this study may differ between financial and non-financial firms.
Empirical Specification and Operational Definition of Variables

The FO valuation function in (14) or (15) provides a basis for the empirical testing in this study. It states that under certain assumptions, the market value of the firm at time \( t \) (\( P_t \)) is a linear function of the abnormal operating earnings in period \( t \) (\( ox_t^a \)), book value and operating assets at the end of period \( t \) (\( bv_t \) and \( oa_t \) respectively), and other (non-accounting) value-relevant information available in period \( t \) (\( v_t \)). However, I first assume away the role of other information or assume that its effect is captured by the constant term and later on relax this assumption. Thus the valuation functions (14) and (15) can be rewritten as (T1a) and (T1b), respectively:

\[
(T1a) \quad P_t = \alpha + \alpha_0 bv_t + \alpha_1 ox_t^a + \alpha_2 oa_t + \epsilon_t
\]

\[
(T1b) \quad g_t = P_t - bv_t = \alpha + \alpha_1 ox_t^a + \alpha_2 oa_t + \zeta_t
\]

where \( g_t \) denotes unrecorded goodwill in year \( t \). In the above and all following models, the subscript representing an individual firm is subsumed.

Kothari and Zimmerman (1995) evaluate the relative merits of price and return models for accounting research and conclude that "the combined use of both return and price models may be useful" (p. 155). Following their recommendation, I also consider an alternative specification of model (T1a) given below:

\[
(T2) \quad R_t = \varphi + \varphi_0 \cdot \Delta bv_t / P_{t-1} + \varphi_1 \cdot \Delta ox_t^a / P_{t-1} + \varphi_2 \cdot \Delta oa_t / P_{t-1} + \eta_t
\]

\[\text{22 Since } v_t \text{ is unobservable, it is common in empirical studies to ignore it, see, e.g., Stober (1996) and Dechow, Hutton and Sloan (1999).}\]
where $R_t$ denotes annual return on common stock in year $t$, $P_{t-1}$ is the market value of a firm in year $t-1$, $\Delta$ denotes a change in variables between year $t$ and $t-1$, and others are as defined earlier.

Models (T1) and (T2) are estimated cross-sectionally using observations in each year of 1990-1995 and using cross-sectional, time series pooled observations over the entire 1990-1995 period. In so doing, I measure the market value of the firm as the price of common shares outstanding at the last trading day of the third month after a firm’s fiscal-year end in order to avoid the so-called look-ahead bias (Jaffe, Keim and Westerfield, 1989).

Abnormal operating earnings is calculated as operating earnings minus the cost of using capital to generate earnings (i.e., $o_{x_t}^a = o_{x_t} - r_{f.t_{t-1}}$). Following FO (1995) to assume risk neutrality, the risk-free rate in Japan, Gensaki rate is used to represent the cost of capital ($r_f$). Since there are missing values for the one-month Gensaki rates, the annualized mean three-month Gensaki rate of each year is computed and used. Theoretically, operating assets should be used to calculate the normal operating earnings but because financial assets have no abnormal earnings by definition, I simply use net book value of assets or total stockholders’ equity ($bv_{t-1}$). Operating earnings ($o_{x_t}$) consist of all non-interest earnings from operations, net of all non-interest charges, and are calculated in three alternative ways as: (1) earnings before interest and tax (EBIT); (2) earnings before interest but after tax (EBIAT); and (3) earnings before interest but after tax and extraordinary items (EBIATE). Strictly speaking, excluding extraordinary items in the first two definitions violates the clean surplus assumption. However, since
extraordinary items are transitory and non-recurring and would not be expected to affect firm value, their omission is justifiable. Recent studies such as Dechow, Hutton and Sloan (1999) and Myers (1999) exclude these items. In this study, I include them in the third alternative to see if they enhance the prediction of future abnormal earnings and thus firm value.

Operating assets include all assets and liabilities with book values different from their market values because they are not individually traded in perfect markets. This is calculated as total non-interest earning assets, such as accounts receivable, inventory and net fixed assets, less all non-interest-bearing liabilities such as accounts payable and accrual charges. Unrecorded goodwill is simply measured as the difference between a firm’s market value and book value.

The first hypothesis (H1) can be supported if the estimated parameters in (T1) and (T2) are significantly positive. However, testing for hypotheses H2 to H6 requires the estimation of the persistence of abnormal earnings (EP), accounting conservatism (the extent to which a firm adopts conservative accounting practices: AC), and the growth in operating assets (GO). To estimate EP, AC, and GO for each firm, I estimate the FO (1995) linear information model (LIM) discussed in Chapter 3. Recall that the LIM parameters, $\sigma_{11}$, $\sigma_{12}$, and $\sigma_{22}$ capture the degrees of EP, AC, and GO, respectively. To enhance inter-firm comparability of these LIM parameters, I first normalize both the dependent and independent variables of the LIM for each firm by subtracting from each variable its mean and dividing by its standard deviation as below:
\[ \text{nox}_t^a = \frac{\text{ave}(\text{ox}_t^a) - \text{ave}(\text{ox}_{t+1}^a)}{\text{sd}(\text{ox}_{t+1}^a)} \]

\[ \text{noa}_t = \frac{\text{oa}_t - \text{ave}(\text{oa}_t)}{\text{sd}(\text{oa}_t)} \]

where \text{ave}() means the time-series average over the past 15 years from 1975 to 1989, and \text{sd}() means the standard deviation over the same period.

Using the above normalized values for each firm over the past 15-year period from 1975 to 1989, I estimate the following time-series regressions for each firm to obtain standardized estimates of EP, AC and GO parameters, i.e., \( \varphi_{11}^*, \varphi_{12}^* \), and \( \varphi_{22}^* \), respectively:

\[ \text{nox}_{t+1}^a = \hat{\varphi}_{11}^* \text{nox}_t^a + \hat{\varphi}_{12}^* \text{noa}_t \]

\[ \text{noa}_{t+1} = \hat{\varphi}_{22}^* \text{noa}_t \]

The standardized coefficient, called the beta coefficient, adjusts the estimated slope parameter of the original (unnormalized) regression model by the ratio of the standard deviation of the independent variable to the standard deviation of the dependent variable. The beta coefficient of 0.5, for example, means that when the independent variable changes by the magnitude of one standard deviation, the dependent variable will change by the magnitude of 0.5 standard deviation.

The use of the standardized beta coefficients in the above regressions is better than the use of the nonstandardized coefficients, especially for the purpose of inter-firm comparison of differences in EP, AC, and GO, because the normalized variables

\[ ^{23} \text{See Pindyck and Rubinfeld, 1981, p. 90 for a proof of it.} \]
are unit free and one does not have to worry about the differences in units and variances between the original dependent and independent variables.

Once the standardized estimates of LIM parameters representing EP ($\hat{\omega}_{11}^*$), AC ($\hat{\omega}_{12}^*$), and GO ($\hat{\omega}_{22}^*$) are obtained for each firm, I rank all the firms on the basis of the magnitudes of EP, AC, and GO, and stratify the sample into three groups: (1) the low (bottom 33.3%) group; (2) the median (middle 33.3%) group; and (3) the high (top 33.3%) group. I then assign values 1, 2 and 3 as the ranks for the low, median and high groups respectively for subsequent analyses. The ranked variables are $ep$, $ac$ and $go$.

Since results from testing the first hypothesis (H1) show that the goodwill model (T1b) outperforms the price and return models (T1a and T2) in supporting the FO model, as shown in Table 2, I test the remaining hypotheses using only the goodwill model.

To test hypotheses H2 to H4, I add onto the goodwill model (T1b) interaction ranked variables of $ep$, $ac$ and $go$ respectively, thus generating test models (T3) to (T5) given below:

(T3) \[ g_i = P_i - bv_i = \alpha + \alpha_1 ox_i^g + \alpha_2 oa_i + \alpha_3 ox_i^g \cdot ep + \mu_i \]

(T4) \[ g_i = P_i - bv_i = \alpha + \alpha_1 ox_i^g + \alpha_2 oa_i + \alpha_3 oa_i \cdot ac + \sigma_i \]

(T5) \[ g_i = P_i - bv_i = \alpha + \alpha_1 ox_i^g + \alpha_2 oa_i + \alpha_3 oa_i \cdot go + \phi_i \]

In the above models, variables $ep$, $ac$ and $go$ represent the ranks of EP, AC and GO respectively and each takes the value of 1, 2 or 3 for an individual firm. Other
variables are as defined earlier. The hypotheses H2 to H4 can be supported if the estimated $\alpha_3$ parameters in (T3) to (T5) are significantly positive.

While hypotheses H2 to H4 are concerned with the individual effect of EP, AC, and GO on firm valuation, the hypotheses H5 and H6 are concerned with the joint (or interaction) effect of AC and GO and that of AC and EP. To test for these joint or interaction effects, I estimate models (T6) and (T7) as follows and the hypotheses can be supported if $\alpha_3$ of these models are significantly positive.

\[
\begin{align*}
(T6) \quad g_t &= P_t - bv_t = \alpha + \alpha_1 o_{xt}^a + \alpha_2 oa_{t} + \alpha_3 oa_{t}go_{ac} + \iota_t \\quad (T7) \quad g_t &= P_t - bv_t = \alpha + \alpha_1 o_{xt}^a + \alpha_2 oa_{t} + \alpha_3 oa_{t}ep_{ac} + \iota_t
\end{align*}
\]

To test hypotheses H7 and H8, which further examine the valuation effect of accounting conservatism inferred from depreciable fixed assets, I measure the proportion of depreciable fixed assets to total assets (%FA) and the remaining useful life of depreciable fixed assets (LIFE) as below, following Ryan (1995):

\[
\begin{align*}
%FA &= \frac{\text{net fixed assets}}{\text{total assets}} \\
LIFE &= \frac{\text{net fixed assets}}{\text{depreciation charges}}^{24}
\end{align*}
\]

I then rank the sample firms on the basis of %FA (LIFE) and then stratify them into three groups: (1) the low (bottom one-third) %FA (short LIFE) group; (2) the median (middle one-third) %FA (medium LIFE) group; and (3) the high (top one-third) %FA (long LIFE) group. Again, the low, median and high groups are given the ranks of 1, 2 and 3 respectively. The ranked variables for %FA and LIFE are

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24 The estimate for LIFE is most accurate if the assets have no salvage values and are depreciated using straight-line method. I use this as a proxy since it is difficult to estimate LIFE using accelerated depreciation, which is commonly adopted by Japanese firms.
rfa and rlife respectively. I then estimate models (T8) to (T11) using variables measuring the interactions of rfa and rlife with operating assets and accounting conservatism respectively. The hypotheses H7 and H8 are supported if the parameters of the following test models are positive:

(T8) \[ g_i = P_i - bv_i = \alpha + \alpha_1 ox_i^a + \alpha_2 o_{a_i} + \alpha_3 o_{a_i} rfa + \tau_i \]

(T9) \[ g_i = P_i - bv_i = \alpha + \alpha_1 ox_i^a + \alpha_2 o_{a_i} + \alpha_3 o_{a_i} rfaac + \psi_i \]

(T10) \[ g_i = P_i - bv_i = \alpha + \alpha_1 ox_i^a + \alpha_2 o_{a_i} + \alpha_3 o_{a_i} rlife + \tau_i \]

(T11) \[ g_i = P_i - bv_i = \alpha + \alpha_1 ox_i^a + \alpha_2 o_{a_i} + \alpha_3 o_{a_i} rlifeac + \delta_i \]

Ranked values instead of actual, continuous values are used for EP, AC, GO, %FA and LIFE in models (T3) to (T11). By doing so, a more distinct pattern of regression coefficients can be obtained to identify the interaction effect of such variables on firm valuation. In addition, as will be explained in more details later in the results and analyses section (Chapter Six), significant portions of the LIM parameters estimated from the sample in this study fall outside the restricted bounds specified by FO. Therefore, it is more appropriate to use ranks instead of continuous values.

**Additional Explanatory Variables**

The FO valuation in (14) includes the variable representing other information, \( v_i \), which captures all other nonaccounting information relevant to the prediction of future abnormal earnings but is independent of current and past (abnormal) earnings. It could be industry-wide variables and market-wide, macro-economic
variables. However, I omit this other information variable from my empirical specifications in (T1) to (T11), assuming that it may not be systematically correlated with the included accounting variables, i.e., abnormal earnings and operating assets. If this is not true, excluding the variable $v_i$ may create well-known problems of omitted variables.

When certain correlated variables are omitted from the model specification, the slope coefficient estimated from the misspecified regression model will most likely be biased. For example, if the true model is:

$$y_i = \beta_1 x_{1i} + \beta_2 x_{2i} + \varepsilon_i$$

and the regression model is:

$$y_i = \beta_1^* x_{1i} + \varepsilon_i^*$$

It can be proved that:

$$E(\tilde{\beta}_1) = \beta_1 + \beta_2 \frac{\sum x_{1i} x_{2i}}{\sum x_{1i}^2} = \beta_1 + \beta_2 \frac{Cov(x_1, x_2)}{Var(x_1)}$$

Unless $x_1$ and $x_2$ are uncorrelated, i.e., $Cov(x_1, x_2) = 0$, the least-squares slope estimate will give a biased estimate of the true slope parameter.

In an attempt to alleviate potential problems of omitted variables, I also include into models (T1) to (T11) some macro-economic variables such as market returns, industry and year dummies. Japanese listed companies are classified into nine industries, namely: agricultural, forestry, fishery and mining; construction;

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manufacturing; wholesale and retail; financial and insurance; real estate; transportation and communication; electric power and gas; and services. The industry dummy \((ind_i)\) and year dummy \((yr_t)\) are introduced into each test model discussed above as additional explanatory variables. For example, (T1b) would then become:

\[
(T12) \quad g_t = P_t - bv_t = \alpha + \alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 \sum_{i=1}^{5} ind_i + \alpha_4 \sum_{r=1}^{5} yr_r + \kappa_i
\]

where \(ind_i = 1\): if a firm belongs to an industry \(i\); or 0: otherwise

\(yr_r = 1\): if \(r = t\); or 0: otherwise
CHAPTER SIX: RESULTS AND ANALYSES

Descriptive Statistics

Table 1 presents descriptive statistics for the variables used in estimating the FO (1995) valuation model. Panel A presents univariate statistics for the 6,237 firm-year observations in the full sample for the period 1990-1995. The median market value (P) is ¥51,581 million, which is 100% higher than the median book equity value (BV) of ¥25,666 million. The existence of significant difference between price and book values (i.e., unrecorded goodwill) suggests that Japanese accounting is more conservative than US accounting. While the median book-to-market ratio (B/P) for the US sample in Ryan (1995) is 0.73 for the years 1977-89, Japanese firms have a median B/P of 0.5 only in 1990-95. Median goodwill (g) is ¥ 22,972 million. The median abnormal operating earnings before interest and tax (OXAA) is ¥1,112 million while the same after tax (OXAB) is ¥ 195.3 million. The median abnormal operating earnings before interest but after tax and extraordinary items, hereafter referred to as abnormal operating earnings after extraordinary items (OXAC) is ¥ 160.7 million, indicating firms normally have net extraordinary losses. The relatively high positive abnormal operating earnings may be caused by the actual cost of capital being higher than the risk-free rate, on average. The median net operating assets (OA) stands at ¥ 20,242 million. Japan experienced a bear market over the period 1990 to 1995, with negative market median and mean returns (MRET) at -13% and -0.7% respectively. Firms in the sample on average perform less well than the market and have higher negative annual returns (RET) at a median and mean value of -16% and -9% respectively.
Around 23% of the total assets of the median firm are depreciable fixed assets (FA) and their remaining useful life (LIFE) averages 6.3 years.

Panel B of Table 1 provides the pairwise correlation matrix of variables. Pearson correlation coefficients are shown in the upper triangle while Spearman correlation coefficients are shown in the lower triangle. As expected, market value (P) is positively and significantly correlated with book equity value (BV, Pearson: 0.61; Spearman: 0.92), abnormal operating earnings (OXAA, OXAB and OXAC), net operating assets (OA, Pearson: 0.35; Spearman: 0.71) and especially, goodwill (g, Pearson: 0.98; Spearman: 0.87). Correlation of P with abnormal earnings is highest when interest and tax are excluded from earnings (i.e., OXAA, Pearson: 0.54; Spearman: 0.53) and lowest when extraordinary items are included (i.e., OXAC, Pearson: 0.33; Spearman: 0.13). This suggests that investors value recurring earnings more than transitory extraordinary earnings. Company return (RET) is positively correlated with market return (MRET, Pearson: 0.35; Spearman: 0.63), indicating sample firms’ performance is generally following the market performance. Pearson correlation shows a positive but low correlation of 0.028 between P and the proportion of depreciable fixed assets to total assets (FA), whereas correlation between P and remaining asset life (LIFE) is insignificantly negative (-0.02). On the other hand, Spearman correlations of P with FA and LIFE are negative, -0.08 and -0.04 respectively. These results suggest mixed perception of the valuation effect of accounting conservatism inferred from depreciable fixed assets. On the other hand, BV is highly correlated with OXAA (Pearson: 0.71; Spearman: 0.45) and OA (Pearson: 0.70; Spearman: 0.73), whereas OA has high Pearson correlation coefficients with OXAA (0.55) and OXAB
These results are predictable since earnings increase book equity value and net operating assets while operating assets form part of the book value. This inter-relationship may create multicollinearity problem when these variables are regressed together.

Results for Hypothesis H1

Hypothesis H1 directly tests the FO (1995) valuation model using the price, goodwill and return models (T1a), (T1b) and (T2) presented in Chapter Five. They are estimated with linear regression, and are represented by M1, M2 and M3 respectively in Table 2, whereas M4 represents the return model with market return added as the other (non-accounting) information. Both cross-sectional, time series pooled observations over the entire period of 1990-1995, and cross-sectional observations in each year of 1990-1995 are used. In addition, parameters of the models are estimated using three different measures of abnormal operating earnings, namely (1) earnings before interest and tax (EBIT), represented by OXAA in Panel A; (2) earnings before interest but after tax (EBIAT), represented by OXAB in Panel B; and (3) earnings before interest but after tax and extraordinary items (EBIATE), represented by OXAC in Panel C.

Parameter Estimates for the Price Model (T1a)

As hypothesized, pooled regression coefficient of book equity value (BV) is positive and significant at 1% level, with value increasing from 2.74 to 3.35 and t-statistic increasing from 36 to 52 when going down from Panel A to Panel C. Similarly, parameter estimates of abnormal operating earnings are significantly
positive. Extant literature generally views extraordinary items as value irrelevant, arguing that they are irregular and non-recurring, and would largely be ignored by investors. My results support this view. The parameter estimate of abnormal operating earnings after tax and extraordinary items (OXAC: 16.57) is only slightly more positive than that of EBIAT (OXAB: 16.49) but far more positive than that of abnormal EBIT (OXAA: 10.79). This indicates that after-tax earnings are more value-relevant than before-tax earnings, which is expected, given that only earnings after tax are distributable to shareholders.

As regards net operating assets (OA), negative and significant coefficients are found, irrespective of the choice of abnormal earnings. Coefficient turns more negative from -0.66 in Panel A to -0.84 in Panel B but increases slightly back in Panel C to -0.76. This contradicts the hypothesis and indicates aggressive instead of conservative accounting, or implies that stock prices do not reflect rational perception of the value-relevance of operating assets. Alternatively, the negative parameter of OA may be resulted from problem of multicollinearity since book equity value, abnormal operating earnings and net operating assets are highly correlated. For example, both BV and OA measure some common items in the balance sheet, with OA being a subset of BV.

Among all models presented, price models have the highest adjusted R-squares, consistently to be 42%. Adjusted R-squares are relatively higher for 1990 and 1991 for all three measures of abnormal earnings, ranging from 47% to 53%.
Recall that FO (1995) express the coefficients in the valuation function (14) in terms of the LIM parameters representing earnings persistence (\( \sigma_{11} \)), accounting conservatism (\( \sigma_{12} \)) and growth (\( \sigma_{22} \)) as follows:

\[
P_i = b v_i + \alpha_1 \cdot ox_i^a + \alpha_2 \cdot oa_i + \beta_i \cdot v_i
\]

where

\[
\alpha_1 = \frac{\sigma_{11}}{R_f - \sigma_{11}}
\]

\[
\alpha_2 = \frac{\sigma_{12} R_f}{(R_f - \sigma_{22})(R_f - \sigma_{11})}
\]

FO impose a set of restrictions on the LIM parameters, and \( \sigma_{12} \geq 0 \) is one of them. However, significant proportions of the LIM parameters estimated in this study turn out to fall outside the restricted bounds. In particular, over 55% of the sample firms have negative \( \sigma_{12} \) (see Table 3 and more discussion below on results for the LIM estimation). On the other hand, \( \sigma_{11} \) and \( \sigma_{22} \) estimates mostly have values below \( R_f \) (i.e., one plus the risk-free rate in Japan - the mean Gensaki rate), therefore \( \alpha_2 \) (coefficient of OA) becomes negative for most firms. Myers (1999) also finds similar contradiction to FO's prediction using US data for the period 1975 to 1996. The median accounting conservatism parameter in his sample is significantly negative for even the most conservative firms. The results do not improve upon his attempt to establish a more complex model to capture the actual effects of conservatism by decomposing the conservatism parameter into its income and book value components.
Parameter Estimates for the Goodwill Model (T1b)

Results for the goodwill model (T1b) are shown under M2 in Panels A to C. Coefficients of abnormal operating earnings are higher than those of the price model, being 18.4, 21.4 and 19.5 respectively for OXAA, OXAB and OXAC. Coefficients of operating assets are significantly positive, 0.2 in Panel B and 0.4 in Panel C, an improvement over all price models, which give negative OA parameters. Overall, hypothesis one (H1) is well supported except that negative OA parameter is obtained when abnormal EBIT is used. However, adjusted R-squares are at 10-20% level only, much lower than those for the price model (T1a). High adjusted R-squares in the price model (see M1) are due, in large part, to strong relation between price and book value. Thus it is not surprising to obtain lower adjusted R-squares for the goodwill model. Similar results are found for cross-sectional regressions (details not reported here).

Parameter Estimates for the Return Model (T2)

Results for the return model (T2) are reported under M3 and M4. To control for heteroscedasticity, all variables are deflated by market value of equity at the end of three months after the previous fiscal year end, i.e., P_{t-1}. As hypothesized, deflated changes in abnormal operating earnings are significantly positive, valued between 0.45 to 0.58. Contrary to theory, coefficients of deflated change in book equity value (BP) are insignificantly negative. In addition, in line with the results for model (T1a), deflated changes in operating assets (OAP) are significantly negative, being -0.111 to -0.118. Adjusted R-squares are low, valued between 0.41% to 0.57%. I therefore extend M3 by adding market return (MRET) to proxy for other information (\nu_t) in M4, and better results are obtained. Adjusted R-squares
increase significantly to 12-13%. Market return is highly significant with coefficient of 0.38. Coefficients of BP become positive, though insignificant (0.01 to 0.096). Coefficients of OAP become less negative, around −0.08 while coefficients of deflated changes in abnormal earnings become slightly more positive except for abnormal earnings after extraordinary items.

Cross-sectional regressions give mixed results in different years. Parameters of BP are positive and significant at 1% in 1990, 1991 and 1994 for all cases and have values between 0.7 and 1.2. Deflated changes in abnormal earnings are significantly positive at 1% in 1992 and 1993 for all three measures of earnings and for some of the measures in 1990 and 1991. Most OAP coefficients in 1991 and 1992, and for some models in 1990, are negative and significant at 1%. Coefficients of MRET are mostly positive but insignificant. Significant values are obtained for all models in 1990 only. All regression coefficients in 1995 are insignificant.

**Estimates and Ranking of LIM parameters**

To test hypotheses H2 to H6, I first estimate the persistence of abnormal earnings (EP), the extent to which a firm adopts conservative accounting practices (AC), and the growth in operating assets (GO). The LIM parameters, \( \sigma_{11}, \sigma_{13}, \) and \( \sigma_{22} \) capture the degrees of EP, AC, and GO respectively and are estimated using time-series auto-regression of normalized variables of abnormal operating earnings and operating assets of each firm over the period 1975-1989.
Table 3 presents descriptive statistics of the results. Again, three sets of regressions are used to capture the effect of alternative measures of abnormal operating earnings. The EP and AC parameters estimated using abnormal EBIT (w11a and w12a respectively) are smaller than expected but have the highest median values and fall 'better' within the value bounds imposed by FO than those obtained using abnormal EBIAT (w11b and w12b) and EBIATE (w11c and w12c). The median w11a and w12a are 0.098 and -0.034 respectively. As discussed in Chapter Three, FO impose restrictions on the LIM parameters as follows: (1) $0 \leq \omega_{11} < 1$, (2) $1 \leq \omega_{22} < R_f$ and (3) $\omega_{12} \geq 0$. All three measures of $\omega_{11}$ give estimates mostly within the upper bound of 1, with only 0.1-0.2% above 1. This implies that the marginal effect of positive (or zero) persistence decays with time and approximates reality. However, 22.6% of w11a fall below the lower bound of zero while 39.2% of w11b and 44.2% of w11c are negative. This implies oscillating persistence and seems implausible. Extant literature views extraordinary items as transitory, hence w11a and w11b should, in theory, be more persistent than w11c. My results seem to reflect this, with w11a and w11b better conform to FO's restrictions.

Results deviate even more for the AC parameters, all three measures give negative median values. Contrary to theory, as high as 55.9% of w12a, 66.35% of w12b and 65.7% of w12c are negative, indicating strong aggressive accounting rather than conservative accounting adopted by the majority of companies. This is inconsistent with real world accounting, especially Japanese accounting is known to be more conservative than the US accounting\textsuperscript{26}. Therefore it is probable that

\textsuperscript{26} See, for instance, Cheung, Kim and Lee (2000), Bae and Kim (1998) and Bildersee et al. (1990).
the LIM does not capture the effect of conservatism properly. This finding is consistent with Myers (1999) and Stober (1996). Stober (1996) regresses price on abnormal earnings and operating assets and uses the estimated parameters to infer the structure of the earnings information dynamics. Results indicate that the market does not price accounting numbers as if they are conservative. The failure of the LIMs to describe the effects of conservatism is not sensitive to the exclusion of non-conservative firms in the sample. However, since the tests are price level regressions, Stober cannot determine whether the LIM accurately models the time series behavior of abnormal earnings. More recently, Myers (1999), applying modified LIMs on a sample of US firms, finds approximately 60% of the conservatism parameter estimates negative. Providing two parameters of conservatism, the income parameter and book value parameter does not remove this anomaly. Evidence suggests that the time series of residual income is non-stationary and that the theoretical models of conservatism fail to accurately characterize the time series of residual income.

Recent empirical studies in residual income valuation attempt to implement valuation by modifying the LIM (e.g., Frankel and Lee 1998 model expectations of future return on equity as a piecewise function) or by adding other information to the LIM (e.g., Dechow et al. 1998 introduce five conditioning variables27). Myers points out that these modifications create internal inconsistencies and he modifies the LIM differently while preserving internal consistency. Yet he finds that by providing two parameters of conservatism, and by incorporating non-

27 These conditional variables measure the magnitudes of abnormal earnings, special items and operating accruals respectively, the dividend payout policy, and the historical persistence of abnormal earnings for firms in the same industry.
accounting information such as order backlog into the LIM cannot capture the true stochastic relationship among accounting variables and provide value estimates better than book value alone. Moreover, more complex valuation models tend to provide noisier estimates of firm value.

In addition, Bar-Yosef, Callen and Livnat (1997) examine the Ohlson valuation framework empirically and find evidence rejecting the single-period linear information dynamics. Except for dividends, none of the accounting variables in the LIM are found to be value-relevant. The sign restrictions of the variable coefficients in the LIM are either not satisfied or at best satisfied trivially. When they extend the analysis to a multi-lagged linear information system, earnings, book values of equity and dividends become value-relevant.

As regards GO, the estimates fall outside the restriction bounds most extensively, 84.8% of the firms have parameters below the lower bound of 1, whereas 6.1% to 11% are above the upper bound of $R_f$ (i.e., one plus the risk-free rate). This implies that most (84.8%) of the firms would have going concern problems ($\sigma_{22} < 1$ implies asymptotic liquidation of the firm's operations), while most of the remaining would have growth divergence ($\sigma_{22}$ beyond $R_f$). This is highly unrealistic, especially given the bubble stock market of Japan in the 1980's.

Since the concern of this study is to rank the parameters for testing subsequent hypotheses, rather than to estimate the values of individual parameter of the LIM, I

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28 The mean Gensaki rates used to proxy the cost of capital (i.e., risk-free rate) for calculating abnormal earnings during 1975-1989 fall between 3.85% to 10.73%.
do not attempt to incorporate additional conditioning variables to improve the power of the LIM to capture the market's expectation of future residual income. Based on the magnitudes of EP, AC and GO, firms are ranked into three groups. This results in 387, 388 and 387 firms in the upper, middle and lower 33.3 percentile group respectively for each parameter. Values of 1, 2 and 3 are respectively assigned to the lower, middle and upper groups. Since abnormal EBIT gives parameters better conforming to the theoretical LIM, the remaining sections report results obtained from firms ranked in terms of w11a and w12a.

Results for Hypotheses H2 to H4

Hypotheses H2 to H4 test the valuation effects of earnings persistence (EP), accounting conservatism (AC) and growth of operating assets (GO) and results are presented in Table 4. Since cross-sectional regressions give mixed results among different years while price and return models give unsatisfactory results for Hypothesis H1, the remaining hypotheses are tested using pooled regressions of the goodwill model, with interaction variables of operating earnings (operating assets) and the ranked values of earnings persistence, growth and/or accounting conservatism added. The test models (T3) to (T5) discussed in Chapter Five are represented by M2 to M4 in Table 4. To facilitate comparison with the findings for H1, results for test model (T1b) are presented again here as M1. Similar to the presentation in Table 2, results for the same model regressed on different measures of abnormal operating earnings, viz., OXAA, OXAB and OXAC are reported in Panel A through Panel C. Comparing the results for M1 with the other five models, the inclusion of interaction variables generally pushes up the adjusted R-
squares by 2 to 3 times, and generates more positive OA parameters but at the same time drives down the value of all parameter estimates of abnormal earnings.

*Valuation Effect of Earnings persistence (H2)*

As hypothesized, parameters of the interaction variable of abnormal operating earnings with the ranked value of earnings persistence are positive and significant, see OXAA*ep, OXAB*ep and OXAC*ep of M2 in Panels A to C. The adjusted R-squares are quite high too, at 30-45%. Therefore H2 is supported, confirming that investors place higher value on abnormal earnings when the earnings series are more persistent. This is consistent with the findings of prior studies and reflects that investors generally place higher value on firms with stronger capacity to maintain their earnings persistence. It is interesting to find that the estimated parameter of OXAC*ep (3.79) ranks highest among its three variants, suggesting that, against general perception, extraordinary items have positive marginal valuation impact. Since both abnormal earnings and interaction variable containing abnormal earnings are regressed together, it is not surprising to find that the parameter estimates of OXAB and OXAC become insignificant and significantly negative at 5% level respectively.

*Valuation Effect of Accounting Conservatism (H3)*

Going down from Panel A to Panel C, parameter of the interaction variable of net operating assets and ranked value of accounting conservatism (OA*ac) in M3 is significantly negative (-0.044) when abnormal EBIT is used; insignificantly
different from zero (0.028) for abnormal EBIT; and positive (0.042) and
significant at 2% level when extraordinary items are considered. This implies that
accounting conservatism accentuates the valuation effect of operating assets, i.e.,
H3 is supported, when abnormal earnings have extraordinary gains or losses taken
into account.

Valuation Effect of Growth (H4)

As opposed to H4, parameter of the interaction variable of net operating assets and
ranked growth (OA*go) is significantly negative (-0.059, at 1% level) when
goodwill is regressed on OXAA (see M4, Panel A of Table 4); insignificantly
negative (-0.029) with OXAB (Panel B); and significantly negative (-0.042 at 5%
level) when OXAC is used (Panel C). This contradicts the hypothesis that, other
things being equal, the market generally places higher value on operating assets of
fast growing firms. As noted earlier for H1, the contradictory results for the LIM
may contribute to the negative parameters obtained in subsequent tests for growth
and conservatism. Alternatively, this can be explained by growth mitigating the
effect of conservatism on book value, since there are relatively more undepreciated
new assets than conservatively depreciated old assets (Beaver and Ryan, 2000).
Hence unrecorded goodwill is reduced and investors adjust their perception on
operating assets of growing firms accordingly.

Results for Hypotheses H5 and H6

Hypotheses H5 and H6, operationalised by test models (T6) and (T7), test the
interaction effect of accounting conservatism with growth and that of conservatism
with earnings persistence. M5 and M6 in Table 4 report these results respectively. Contrary to hypothesis H5, parameter of the interaction variable of operating assets with ranked conservatism and ranked growth \((OA^* go^* ac)\) is significantly negative \((-0.029)\) when abnormal EBIT is included in the regression, resulting in a 45% adjusted R-square. It is insignificantly negative for the other two measures of abnormal earnings and adjusted R-squares are lower, around 30%. As explained for H4, the inconsistent results for the LIM and the argument by Beaver and Ryan (2000) that growth mitigates the conservatism effect on book value may contribute to the negative results obtained here.

Beaver and Ryan (2000) hypothesize and confirm that under accelerated (i.e., more conservative) depreciation, when assets grow at a rate \((g)\) below the internal rate of return \((\text{IRR})\)\(^{29}\), conservatism reduces earnings proportionally less than book value. It is because there are relatively more old assets with lower depreciation charged against earnings, hence book return on equity \((\text{ROE})\)\(^{30}\) increases with conservatism. They further hypothesize that the converse is true when \(g > \text{IRR}\). When \(g = \text{IRR}\), conservatism has no effect on ROE because it affects earnings and book value by the same extent. Moreover, the B/P is negatively associated with ROE when \(g < \text{IRR}\). This is because conservatism largely reduces book values while having a smaller effect on earnings, therefore the B/P reduces (unrecorded goodwill increases) while ROE increases. As \(g\) increases, covariance of the B/P with ROE becomes less negative and turns positive as \(g > \text{IRR}\), i.e., B/P reduces and unrecorded goodwill increases. Evidence reveals that there is no association

\(^{29}\) Assumed to be 10% in Beaver and Ryan (2000).

\(^{30}\) Book return on equity is defined as net income available for common shareholders for the year divided by the beginning of year book value of common equity.
between conservatism and future ROE for the high growth firms, which have
growth approximately equals to the IRR. This is consistent with the effect of
conservatism on net income being cancelled off by the effect on book value.

In this study, the estimation period of the LIM is 1975-1989 whereas the FO model
estimation period is 1990-1995. The Japan Stock market experienced a bubble
period during the 1980’s but started to plunge from 1990 onwards, as indicated by
the negative median market and firm returns of -13% and -16% respectively
during 1990-1995 (see Table 1, Panel A). Firms could no longer grow as rapidly
as in the booming period, activities became sluggish after the economic downturn
in 1990. Investments in plant and equipment remained weak. Leading industries
such as steel, automobiles, auto parts and machine tools were hurt. Unemployment
rate surged and consumers contracted their spending (Asian Business, May 1994,
p.34). Faced with financial difficulties, some firms had to undergo restructuring
and downsizing. Beaver and Ryan (2000) have not considered the case when the
growth rate g is negative, however, their hypothetical model implies that the B/P
decreases (i.e., unrecorded goodwill increases) when g is increasingly negative.
This decrease is accentuated as conservatism increases. The test models for
goodwill valuation in this study use operating assets valued between the recession
period of 1990-1995, though the ranked variable of growth is estimated from the
LIM, using time-series data of the booming period 1975-1989. This may
contribute to the negative results obtained for the growth variable and its
interaction variable with conservatism.
On the other hand, hypothesis H6 is supported, with parameters of the interaction variable of operating assets with ranked accounting conservatism and ranked earnings persistence \((OA^* ep^* ac)\) significantly positive, except for the insignificantly negative result shown in Panel A. This agrees with FO's proposition that when the persistence in abnormal earnings is higher, accounting conservatism has more pronounced effect on firm valuation.

**Results for Hypotheses H7 and H8**

Hypotheses H7 and H8 further test the valuation effect of accounting conservatism, based on the proportion of depreciable fixed assets \((%FA)\) and remaining useful life of depreciable fixed assets \((LIFE)\) owned by firms. As seen from Panel A of Table 1, the proportion of fixed assets to total assets held by a median Japanese firm is 23%, only half of the median value of 46 % for the US sample in Ryan (1995). On the other hand, Japanese firms possess fixed assets with an estimated median remaining useful life of 6.3 years, much lower than 9.63 years documented in Ryan (1995). This supports the argument that Japanese firms generally adopt more conservative accounting practices and depreciate their assets faster than their US counterparts.

The above hypotheses are operationalised by test models (T8) to (T11) and pooled regression results are presented under M1 to M4 in Table 5. Significantly positive parameters for the interaction variable of operating assets with ranked \(%FA\) \((OA^* rfa)\) are shown in all three panels. This supports the hypothesis H7 that the valuation effect of accounting conservatism is more pronounced for firms
holding higher proportion of fixed assets. This is because firms holding higher proportion of depreciable fixed assets tend to undervalue their assets more by virtue of conservative accounting practices adopted. Fixed assets are typically recorded using historical cost accounting, which generally gives book values much lower than their market or economic values. Hence the market is placing relatively higher premia on the values of net operating assets of these high %FA firms. OA* rfa * ac, the interaction variable of net operating assets, ranked accounting conservatism and ranked % FA in M2 further tests the valuation effect of accounting conservatism, as inferred by depreciable fixed assets. Again, all parameters of OA* rfa * ac are significantly positive and H7 is supported.

Similarly, implied from Ryan (1995) and Beaver and Ryan (2000), the effect of accounting conservatism on asset valuation would be more pronounced for firms holding depreciable fixed assets of longer remaining useful life, hence the market would also place relatively higher values on these firms (hypothesis H8). However, results do not support this. Significantly negative parameter estimates are obtained for OA* rlife , the interaction variable of net operating assets with ranked remaining fixed assets useful life, and for OA* rlife * ac, the interaction variable of net operating assets, ranked LIFE and ranked conservatism.

The negative results can be interpreted as follows. Firms adopting more conservative accounting practices tend to amortize their fixed assets costs over a shorter period of useful life, thus rational investors would attach a higher positive multiple on the more understated asset values of firms in the short LIFE group than the long LIFE group. In addition, Ryan (1995) provides evidence that the median
book-to-market ratio (B/P) is higher for firms with longer average useful life of assets. He attributes this to the lower effect of accounting conservatism on these long LIFE firms, following his assumption that at acquisition, firms record assets at their market values. Therefore long LIFE firms have relatively higher proportion of new assets on hand which have book values equal to market values. On the other hand, Ryan demonstrates that current and up to at least nine years’ lagged market value changes can predict B/P, a proxy for unrecorded goodwill. This predictive power of B/P is stronger and spans over a longer lagged period for firms possessing higher proportion of fixed assets to total assets, and assets with longer remaining useful life. This supports his argument that there is a longer (remaining useful life) period for the book values of these assets to gradually absorb in each accounting period the prior market value shocks. The accrual accounting process reflects market value changes more slowly in the book values for firms with many fixed assets of long remaining useful lives, thus creating higher unrecorded goodwill for these firms. These different perspectives give rise to opposite interpretation of the valuation impact of fixed assets remaining useful life.

Beaver and Ryan (2000) decompose B/P or unrecorded goodwill statistically into two distinct components of accounting conservatism and delayed recognition. They define delayed recognition as a concept separate from conservatism, in view of its different impact on book values against market values. While conservatism causes book values to be consistently understated compared with market values (i.e., biased), delayed recognition has a two-sided impact, rendering book values differ from market values but the difference would be fully recognised over the useful life of assets. However, it is difficult to isolate delayed recognition totally from conservatism since
conservatism is a fundamental accounting concept underpinning the development of a variety of accounting methods. Beaver and Ryan acknowledge that a given accounting method may simultaneously exhibit both the attributes of delayed recognition and conservatism, or display delayed recognition in some circumstances and conservatism in other circumstances. Therefore it may not be easy to distinguish the impact of each component.

In general, if the accounting treatment can be better explained by conservatism (delayed recognition), there would be a negative (positive) association of unrecorded goodwill with the remaining useful life of assets. Hence the net valuation effect would depend on how investors interpret the implications of long remaining useful life of assets. If they perceive lower conservatism to be associated with long LIFE firms more (rather) than higher unrecorded goodwill resulted from slower incorporation of prior market value shocks into book values of long life assets, then a negative coefficient would be obtained in the regression for test models (T10) and (T11), as in the current study.

Sensitivity Tests

The other information in the FO model captures all other non-accounting information relevant to the prediction of future abnormal earnings and hence firm valuation. It is assumed that all value-relevant accounting information has been conveyed through the contemporaneous book equity value, abnormal operating earnings and net operating assets. I therefore attempt to include some industry-wide and market-wide, macroeconomic variables to test the sensitivity of the
regression results to such non-accounting information. As reported earlier, market return is included in the return model (T2) as an additional variable to proxy for other non-accounting information to test hypothesis H1. Significantly positive parameters are obtained for market return, as shown in all three panels of Table 2. Also, adjusted R-squares rise to about 12.5%, much higher than the 0.5% obtained with other information omitted. However, parameter estimates of the deflated change in net operating assets remain significantly negative.

I also attempt to include industry and year dummies as additional explanatory variables in model (T1b) and models (T3) to (T11). Companies in different industries may adopt different accounting policies and practices that specifically suit their business circumstances. For instance, companies in the construction or manufacturing industry typically have more property, plants and equipment assets than those in the services or wholesale and retail industry, hence the former usually have assets valued more conservatively than the latter. As explained earlier, all companies in the financial industry are excluded to enhance the homogeneity of the information dynamics and economic meanings of accounting values. The final sample also does not have any observations for firms in the electric power and gas industry. Year dummy accounts for macroeconomic changes such as fluctuations in interest rates, gross national products, inflation, etc. in a particular year over the entire sample period of 1990 to 1995.

The pooled regression results for these sensitivity analyses are presented in Tables 6 and 7. Since it is not the interest of the current study to estimate and analyze the parameters of the industry and year dummies, their results are omitted from
presentation for simplicity. Overall, the inclusion of non-accounting information gives more positive and significant OA parameter estimates. The value increase is especially high for the original FO model, as evidenced by the big value jump of parameter estimates and t-statistics of M1 in all panels of Table 6 vs. Table 4. The contrast is especially big for the estimate in Panel A, it reverses from significantly negative to significantly positive. Conversely, most parameter estimates and t-statistics of abnormal earnings are slightly reduced, with highest reduction for M1. As in the case without dummies, significantly positive parameters are obtained for OXAA*ep, OXAB*ep and OXAC*ep, thereby supporting H2 as before. Results for OA*ac are worse off, H3 is not supported at all. For instance, parameter in Panel C of Table 4 is positive and significant at 2% level, however, the same becomes insignificant when dummies are added. Also, parameter in Panel A of Table 6 is more significantly negative than that in Table 4. As before, H4 and H5 are not supported but the same interpretations mentioned earlier apply to these cases as well. The OA*go parameters are less significantly negative or insignificant while the OA*go*ac parameters are slightly more negative or insignificant, when compared with the results in Table 4. H6 is supported as before, parameters of OA*ep*ac in Panels B and C are slightly more significantly positive. On the whole, similar trend of results is found, irrespective of whether dummies are present or not. The industry and year dummies do contribute to explaining firm value since adjusted R-squares increase by 24-29% for M1 and by around 6% for all other models.

Results for H7 and H8 with dummies included (Table 7) are similar to those obtained without dummies (Table 5). In short, H7 is supported but not H8. The
same reasoning regarding the relative market perception of conservatism vs. delayed recognition of prior market value shocks applies to the negative results for H8. Compared with the results in Table 5, the parameter estimates of OA in Table 7 are consistently more positive and significant for all models in all panels. On the other hand, most parameter estimates and t-statistics of abnormal operating earnings are slightly reduced. These changes closely resemble those for H5 and H6. Coefficient estimates of OA* rfa and OA* rfa* ac are mostly less positive than before whereas coefficients of OA* rlife and OA* rlife* ac are more significantly negative than before. Adjusted R-squares range from 36% to 52%, with industry and year dummies accounting for 4-9% increase in explanatory power for firm value.
CHAPTER SEVEN: CONCLUSION

This first essay of the thesis assesses the ability of the linear valuation function proposed by Feltham and Ohlson (1995) to model the role of accounting information in firm valuation. Empirical evidence using Japanese listed firms reveals that firm value is well explained by three accounting fundamentals, namely book value of equity, (abnormal) operating earnings and operating assets. However, as opposed to FO’s prediction, operating assets have a negative instead of positive impact on firm valuation. This suggests that investors are likely to discount the (book) value of operating assets as if aggressive accounting is commonly adopted. This is contrary to real world practices, especially given that Japanese firms are well known for adopting more conservative accounting practices than their US counterparts. Alternatively, the negative valuation impact of operating assets may be an inconclusive interpretation induced by multicollinearity problem in FO’s price and return models. Changing the regressand of all test models from price (or return) to goodwill reverses most of the negative results. Operating assets now demonstrate a significantly positive impact on goodwill, which is consistent with the FO valuation model.

In addition, the study examines how the role of the accounting fundamentals in the valuation model is differentially affected by earnings persistence, accounting conservatism, growth of operating assets, and their combinations. In line with theory, empirical evidence shows that the market places higher value on firms having higher earnings persistence. The market also perceives the fair values of firms to be higher than their book values when more conservative accounting
practices are adopted. Furthermore, evidence supports that, other things being equal, earnings persistence accentuates the valuation effect of accounting conservatism. However, the market does not seem to value growing operating assets as expected. It discounts the value of high growth firms. Evidence also does not support that, other things being equal, growth accentuates the valuation effect of accounting conservatism. This may be contributed by the inconsistent results obtained for the linear information model (LIM) regarding the growth and conservatism parameters. Alternatively, this may be explained by growth mitigating the effect of conservatism on book value, since there are relatively more undepreciated new assets than conservatively depreciated old assets (Beaver and Ryan, 2000). On the other hand, the hypothetical model developed by Beaver and Ryan implies that unrecorded goodwill increases when a firm experiences more negative growth. With the economic downturn of Japan since 1990, a lot of firms contract their businesses, this may contribute to the negative association of goodwill and growth variables in this study.

An alternative measure of accounting conservatism inferred from the proportion of depreciable fixed assets owned by firms gives results supporting the positive valuation effect of accounting conservatism. Ryan (1995) suggests and provides evidence that the accrual accounting process reflects market value changes more slowly in the book values for firms with many fixed assets of long remaining useful lives (long LIFE). This implies higher unrecorded goodwill for long LIFE firms. However, contrary to the implications from Ryan (1995) and Beaver and Ryan (2000), results reveal that goodwill is negatively associated with the remaining useful life of depreciable assets. Alternative explanations are provided
as follows. First, investors view companies having short remaining asset life as more conservative because these firms depreciate asset costs faster. Second, long LIFE firms have relatively higher proportion of new assets on hand which have book values equal to purchase prices, i.e., market values (Ryan, 1995), therefore their book values are relatively less understated. When investors perceive lower conservatism to be associated with longer asset life more (rather) than higher unrecorded goodwill resulted from longer remaining useful life for book values of assets to incorporate prior market value changes, then negative valuation effect of asset life will be observed.

Results for the FO return model are slightly sensitive to macroeconomic variable such as market return added to proxy for the other non-accounting information. For instance, the negative impact of deflated change in operating assets is alleviated a bit while the positive impact of deflated change in abnormal earnings is reinforced slightly. Moreover, market return has a positive impact on firm return and contributes significantly to increase the explanatory power of the return model. In comparison, results for the goodwill models are relatively more sensitive to industry and year dummies added, though the overall valuation trends of earnings persistence and growth of operating assets remain similar irrespective of whether dummies are present or absent. When different industries and individual years are controlled for, the valuation impact of operating assets increases while that of abnormal earnings decreases slightly in general. However, the valuation effect of operating assets no longer increases with the extent to which a firm adopts conservative accounting practices.
Apart from alternative explanations suggested above, the negative results obtained may be attributed to the failure of the linear information dynamics to capture the effects of accounting conservatism and growth of operating assets. A majority of the empirical estimates of the conservatism parameter fall below the restricted bound of zero, implying aggressive accounting. Similarly, 85% of the growth estimates fall below the lower bound of 1, implying asymptotic liquidation of firms during the booming period of 1975-1989. The estimates of earnings persistence parameters fall better within the restriction bounds but there are still over 22% below the lower bound of zero, implying oscillating persistence. These findings are consistent with those in Myers (1999) and Stober (1996).

This essay contributes to provide Japanese evidence on the empirical implications of the FO model. While extant literature on firm valuation framed within the context of FO draws conclusions mainly from US evidence, relatively few studies have examined the issues using the Japanese market. Comparing the Japanese results provided in this thesis with extant US evidence thus provides useful insights into the external validity of the Ohlson (1995) and FO (1995) models. In addition, this essay integrates some of the implications of Ryan (1995) and Beaver and Ryan (2000) into the FO model to test the valuation effect of accounting conservatism, based on depreciable fixed assets. It also contributes to the growing body of evidence to unveil empirical problems associated with the estimation of the LIM.

Overall, the results suggest that the linear information dynamics do not capture aspects of the market valuation process very well. The possible explanations for the
inadequacy of the empirical models may include the following. First, missing values of variables of interest result in significant reduction of observations, rendering it difficult to obtain precise estimates of the time-series parameters of both the LIM and the FO valuation model. Moreover, the sample period of 1975-1995 is divided into two sub-periods for the separate estimation of the LIM (1975-1989) and the FO model (1990-1995), this further reduces the sample firm-years. Second, changes in growth rates, accounting procedures and production technologies over time are likely to cause the time-series processes of accounting information non-stationary. This creates problems for modeling the valuation process.

To estimate firm value more precisely, a better link between current accounting information and future abnormal earnings is necessary. More precise measure of earnings persistence, accounting conservatism and growth of operating assets may give better value estimates of the LIM, which forms the important skeleton of accounting-based valuation theory. FO (1995) do not elaborate on what constitutes the other information in the linear valuation function. It can be industry-wide or economy-wide variables. A careful analysis of the LIM and valuation function based on individual industry and/or other macro-economic variables may give more accurate estimates of the valuation parameters and hence more promising results. FO (1995, 1996) assume investors are risk neutral and interest rates are nonstochastic and flat. A more general analysis in Feltham and Ohlson (1999) assumes no arbitrage in financial markets in addition to clean surplus accounting. Based on these assumptions, FO derive a generalized accounting-based valuation model, using risk-adjusted present value of expected abnormal earnings. Future research using this general form of the valuation model may provide more meaningful empirical results.
Also, instead of using the single-period lagged information dynamics, a multi-lagged autoregressive linear information system can be considered (Bar-Yosef et al., 1997)
## TABLES FOR THE FIRST ESSAY

### Table 1. Panel A - Univariate Statistics for the Full Sample in 1990-1995

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of obs</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Median</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
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<td>P</td>
<td>6230</td>
<td>143151.000</td>
<td>427319.000</td>
<td>51581.000</td>
<td>1950.000</td>
<td>1365000.000</td>
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<td>448570.000</td>
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<td>27636000.000</td>
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<td>-478000</td>
<td>805095400.000</td>
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<td>0.234</td>
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<td>LIFE</td>
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<td>3.760</td>
<td>6.295</td>
<td>2.637</td>
<td>20.740</td>
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### Table 1. Panel B – Pearson and Spearman Correlations

Pearson correlation coefficients are in the upper triangle. Spearman correlation coefficients are in the lower triangle. *P*-values are in parentheses.

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<tr>
<th></th>
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<th>OXAA</th>
<th>OXAB</th>
<th>OXAC</th>
<th>OA</th>
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<th>RET</th>
<th>MRET</th>
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<th>LIFE</th>
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<tr>
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<td>0.3469</td>
<td>0.9822</td>
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<td>0.0218</td>
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<td>0.7067</td>
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**Variable definition**

- **P** = market value of common shares outstanding at the last trading day of the 3rd month after the end of a firm's fiscal year
- **BV** = book equity value at end of year
- **OXAA** = abnormal operating earnings before interest and tax of year
- **OXAB** = abnormal operating earnings before interest but after tax of year
- **OXAC** = abnormal operating earnings before interest but after tax and extraordinary items of year
- **OA** = net operating assets at end of year
- **g** = goodwill of year, calculated as market value (P) minus book equity value (BV)
- **RET** = annual stock return of year, with year ending 3 months after the firm's fiscal year end
- **MRET** = annual market return of year, with year ending Jun 30 (i.e., 3 months after March 31, a common year end for most Japanese firms)
- **FA** = proportion of depreciable fixed assets to total assets
- **LIFE** = remaining useful life of depreciable fixed assets
Table 2. Tests of Hypothesis H1

Panels A to C show the pooled regression results over 1990 to 1995 (no. of observations: N = 6230), using four test models and three variants of abnormal operating earnings.

M1: \[ P_t = \alpha + \alpha_0 \cdot \delta_t + \alpha_1 \cdot \text{OXAA}_t + \alpha_2 \cdot \text{OA}_t + \varepsilon_t \]

M2: \[ g_t = \delta_t - \text{BV}_t = \alpha + \alpha_0 \cdot \delta_t + \alpha_1 \cdot \text{OA}_t + \alpha_2 \cdot \text{OA}_t + \zeta_t \]

M3: \[ \text{R}_t = \varphi + \varphi_0 \cdot \Delta \text{BV}_t / \text{P}_{t-1} + \varphi_1 \cdot \Delta \text{OXAA}_t / \text{P}_{t-1} + \varphi_2 \cdot \Delta \text{OA}_t / \text{P}_{t-1} + \eta_t \]

M4: \[ \text{R}_t = \varphi + \varphi_0 \cdot \Delta \text{BV}_t / \text{P}_{t-1} + \varphi_1 \cdot \Delta \text{OXAA}_t / \text{P}_{t-1} + \varphi_2 \cdot \Delta \text{OA}_t / \text{P}_{t-1} + \varphi_3 \cdot \Delta \text{V}_t / \text{P}_{t-1} + \delta_t \]

Panel A – Abnormal operating earnings before interest and tax (OXAA)

<table>
<thead>
<tr>
<th>Dep Var</th>
<th>INTERCEPT</th>
<th>BV</th>
<th>OXAA</th>
<th>OA</th>
<th>BP</th>
<th>OXAAP</th>
<th>OAP</th>
<th>MRET</th>
<th>Adj R-sq</th>
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<tr>
<td>Predicted Sign</td>
<td>?</td>
<td>+</td>
<td>+</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
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<tr>
<td>M1</td>
<td>Price (P)</td>
<td>(-21644.680)*</td>
<td>(2.736)*</td>
<td>(10.791)*</td>
<td>(-0.657)*</td>
<td>0.418</td>
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<tr>
<td></td>
<td>Gdwill (g)</td>
<td>((3.36))</td>
<td>((35.935))</td>
<td>((17.417))</td>
<td>((-13.939))</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>M3</td>
<td>Return (R)</td>
<td>(-0.089)*</td>
<td>(-0.113)</td>
<td>(0.579)*</td>
<td>(-0.115)*</td>
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<tr>
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<td>((-3.74))</td>
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<tr>
<td>M4</td>
<td>Return (R)</td>
<td>(-0.089)*</td>
<td>(0.041)</td>
<td>(0.615)*</td>
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<td>(0.383)*</td>
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<tr>
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<td>((-21.238))</td>
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<td>((5.204))</td>
<td>((-2.806))</td>
<td>((29.379))</td>
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Panel B – Abnormal operating earnings before interest but after tax (OXAB)

<table>
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<th>Dep Var</th>
<th>INTERCEPT</th>
<th>BV</th>
<th>OXAB</th>
<th>OA</th>
<th>BP</th>
<th>OXBAP</th>
<th>OAP</th>
<th>MRET</th>
<th>Adj R-sq</th>
</tr>
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<td>Predicted Sign</td>
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<td>+</td>
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</tr>
<tr>
<td>M1</td>
<td>Price (P)</td>
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<td>(3.254)*</td>
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</tr>
<tr>
<td>M3</td>
<td>Return (R)</td>
<td>(-0.091)*</td>
<td>(-0.064)</td>
<td>(0.528)*</td>
<td>(-0.118)*</td>
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<td>((-20.514))</td>
<td>((-0.65))</td>
<td>((3.866))</td>
<td>((-3.842))</td>
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</tr>
<tr>
<td>M4</td>
<td>Return (R)</td>
<td>(-0.091)*</td>
<td>(0.096)</td>
<td>(0.538)*</td>
<td>(-0.084)*</td>
<td>(0.383)*</td>
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Panel C – Abnormal operating earnings before interest but after tax and extraordinary items (OXAC)

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<th>OXAC</th>
<th>OA</th>
<th>BP</th>
<th>OXACP</th>
<th>OAP</th>
<th>MRET</th>
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<tr>
<td>M1</td>
<td>Price (P)</td>
<td>(-21614.940)*</td>
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<td>Gdwill (g)</td>
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<td>M3</td>
<td>Return (R)</td>
<td>(-0.090)*</td>
<td>(-0.186)</td>
<td>(0.451)*</td>
<td>(-0.111)*</td>
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<td>M4</td>
<td>Return (R)</td>
<td>(-0.090)*</td>
<td>(0.010)</td>
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<td>(-0.077)*</td>
<td>(0.381)*</td>
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<td>((-21.538))</td>
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<td></td>
</tr>
</tbody>
</table>

* significant at 1% level  # significant at 5% level  t-statistics are in parentheses

Variable definition

- P = market value of common shares outstanding at the last trading day of the 3rd month after the end of a firm’s fiscal year t
- BV = book equity value at end of year t
- OXAA = abnormal operating earnings before interest and tax of year t
- OXAB = abnormal operating earnings before interest but after tax of year t
- OXAC = abnormal operating earnings before interest but after tax and extraordinary items of year t
- OA = net operating assets at end of year t
- g = goodwill of year t, calculated as market value (P) minus book equity value (BV)
- R = annual stock return of year t, with year ending 3 months after the firm’s fiscal year end
- BP = change in book equity value of year t, deflated by P_{t-1}, price of common shares outstanding at the last trading day of the 3rd month after the end of fiscal year t-1
- OXAAP = change in abnormal operating earnings before interest and tax of year t, deflated by P_{t-1}
- OXBAP = change in abnormal operating earnings before interest but after tax of year t, deflated by P_{t-1}
- OXACP = change in abnormal operating earnings before interest but after tax and extraordinary items of year t, deflated by P_{t-1}
- OAP = change in net operating assets at end of year t, deflated by P_{t-1}
- MRET = annual market return of year t, with year ending Jun 30 (i.e., 3 months after March 31, a common year end for most Japanese firms)

(P.S.: OXAA = abnormal operating earnings and is represented by OXAA, OXAB and OXAC in Panels A-C)

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Table 3. Descriptive Statistics of LIM Parameters

\[
\begin{align*}
\text{nox}_{t+1}^o &= \hat{\omega}_{11} \times \text{nox}_t^o + \hat{\omega}_{12} \times \text{noa}_t \\
\text{noa}_{t+1} &= \hat{\omega}_{22} \times \text{noa}_t 
\end{align*}
\]

No of firm-year observations for pooled regressions over 1975 to 1989* = 1162

<table>
<thead>
<tr>
<th>LIM parameter (concept represented)</th>
<th>Predicted Value</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Minimum</th>
<th>25%</th>
<th>50%</th>
<th>75%</th>
<th>Maximum</th>
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</thead>
<tbody>
<tr>
<td>w11a (EP) (0, 1)</td>
<td>0.156</td>
<td>0.218</td>
<td>-0.669</td>
<td>0.009</td>
<td>0.098</td>
<td>0.271</td>
<td>1.333</td>
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<tr>
<td>w12a (AC) 0</td>
<td>-0.063</td>
<td>0.279</td>
<td>-1.046</td>
<td>-0.214</td>
<td>-0.034</td>
<td>0.086</td>
<td>0.944</td>
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</tr>
<tr>
<td>w11b (EP) (0, 1)</td>
<td>0.055</td>
<td>0.203</td>
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<td>-0.022</td>
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<td>0.098</td>
<td>1.372</td>
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</tr>
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<td>w12b (AC) 0</td>
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<td>-0.206</td>
<td>-0.058</td>
<td>0.008</td>
<td>1.431</td>
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<tr>
<td>w11c (EP) (0, 1)</td>
<td>0.037</td>
<td>0.151</td>
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<td>w12c (AC) 0</td>
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<td>1.602</td>
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<tr>
<td>w22 (GO) (1, R_d)</td>
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<td>0.361</td>
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<td>0.744</td>
<td>0.927</td>
<td>1.858</td>
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</tr>
</tbody>
</table>

* Firms with less than 7 years of data are eliminated

Variable definition

w11a = earnings persistence parameter estimated using normalized abnormal operating earnings before interest and tax (EBIT)
w12a = accounting conservatism parameter estimated using normalized abnormal EBIT
w11b = earnings persistence parameter estimated using normalized abnormal operating earnings before interest but after tax (EBIAT)
w12b = accounting conservatism parameter estimated using normalized abnormal EBIAT
w11c = earnings persistence parameter estimated using normalized abnormal operating earnings before interest but after tax and extraordinary items (EBIATE)
w12c = accounting conservatism parameter estimated using normalized abnormal EBIATE
w22 = growth parameter estimated using normalized net operating assets
R_f = one plus the risk-free rate, proxied by the mean 3-month Gensaki rate for each year from 1975 to 1989, which ranges from 3.854% to 10.728% p.a.

EP = earnings persistence
AC = accounting conservatism
GO = growth of operating assets
Table 4. Pooled regressions of interaction variables: earnings persistence, accounting conservatism and growth

Panels A-C show the pooled results over 1990-95, using six test models and three variants of abnormal operating earnings
Dependent variable = Goodwill (g)

### Panel A – Abnormal operating earnings before interest and tax (OXAA)

<table>
<thead>
<tr>
<th>Predicted Sign</th>
<th>INTERCEPT</th>
<th>OXAA</th>
<th>OXAA*ep</th>
<th>OXAA*ac</th>
<th>OXAA*go</th>
<th>OXAA<em>go</em>ac</th>
<th>OXAA<em>ep</em>ac</th>
<th>Adj R-sq</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>18361.000*</td>
<td>18.370*</td>
<td>-0.003#</td>
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</tr>
<tr>
<td>M2</td>
<td>16380.810*</td>
<td>4.721*</td>
<td>0.386*</td>
<td>1.999*</td>
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<tr>
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<td>(7.822)</td>
<td>(8.260)</td>
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<td>(8.274)</td>
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<tr>
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<td>-0.059*</td>
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### Panel B – Abnormal operating earnings before interest but after tax (OXAB)

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<th>INTERCEPT</th>
<th>OXAB</th>
<th>OXAB*ep</th>
<th>OXAB*ac</th>
<th>OXAB*go</th>
<th>OXAB<em>go</em>ac</th>
<th>OXAB<em>ep</em>ac</th>
<th>Adj R-sq</th>
</tr>
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<tbody>
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<td>21.395*</td>
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### Panel C – Abnormal operating earnings before interest but after tax and extraordinary items (OXAC)

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<th>OXAC*go</th>
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<th>OXAC<em>ep</em>ac</th>
<th>Adj R-sq</th>
</tr>
</thead>
<tbody>
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<td>0.702*</td>
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</tr>
</tbody>
</table>

* significant at 1% level  # significant at 2% level  # significant at 5% level  t-statistics are in parentheses

**Variable Definition**

- g = goodwill of year t, calculated as market value (P) minus book equity value (BV)
- OXAA = abnormal operating earnings before interest and tax of year t
- OXAB = abnormal operating earnings before interest but after tax of year t
- OXAC = abnormal operating earnings before interest but after tax and extraordinary items of year t
- OA = net operating assets at end of year t
- OXAA*ep = interaction variable of abnormal operating earnings OXAA and ranked earnings persistence, where ep = 1, 2 or 3
- OXAB*ep = interaction variable of abnormal operating earnings OXAB and ranked earnings persistence, where ep = 1, 2 or 3
- OXAC*ep = interaction variable of abnormal operating earnings OXAC and ranked earnings persistence, where ep = 1, 2 or 3
- OXAA*ac = interaction variable of net operating assets and ranked accounting conservatism, where ac =1, 2 or 3
- OXAB*go = interaction variable of net operating assets and ranked growth, where go =1, 2 or 3
- OXAB*ac = interaction variable of net operating assets, ranked earnings persistence and ranked accounting conservatism
- OXAB*ep*ac = interaction variable of net operating assets, ranked earnings persistence and ranked accounting conservatism
Table 5. Pooled regression results for fixed assets (FA) proportion and remaining FA life

Panels A-C show the pooled results over 1990-95, using four test models and three variants of abnormal operating earnings. Dependant variable = Goodwill (g)

Panel A – Abnormal operating earnings before interest and tax (OXAA)

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<th>Predicted Sign</th>
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<th>OXAA</th>
<th>OA</th>
<th>O<em>A</em>rfa</th>
<th>O<em>A</em>rfa*ac</th>
<th>O<em>A</em>rlife</th>
<th>O<em>A</em>rlife*ac</th>
<th>Adj R-sq</th>
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Panel B – Abnormal operating earnings before interest but after tax (OXAB)

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<th>O<em>A</em>rlife*ac</th>
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Panel C – Abnormal operating earnings before interest but after tax and extraordinary items (OXAC)

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<th>Adj R-sq</th>
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* significant at 1% level  t-statistics are in parentheses

Variable definition:

- $g$ = goodwill of year $t$, calculated as market value (P) minus book equity value (BV)
- OXAA = abnormal operating earnings before interest and tax of year $t$
- OXAB = abnormal operating earnings before interest but after tax of year $t$
- OXAC = abnormal operating earnings before interest but after tax and extraordinary items of year $t$
- OA = net operating assets at end of year $t$
- O*A*rfa = interaction variable of net operating assets and ranked proportion of fixed assets to total assets, where $rfa = 1, 2 \ or \ 3$
- O*A*rfa*ac = interaction variable of net operating assets, ranked proportion of fixed assets to total assets and ranked accounting conservatism, where $ac = 1, 2 \ or \ 3$
- O*A*rlife = interaction variable of net operating assets and ranked remaining useful life of fixed assets, where $rlife = 1, 2 \ or \ 3$
- O*A*rlife*ac = interaction variable of net operating assets, ranked remaining useful life of fixed assets and ranked accounting conservatism
Table 6. Pooled regression results of interaction variables in industry and year dummies

Panels A-C show the pooled results over 1990-95, using six test models and three variants of abnormal operating earnings
Dependent variable = Goodwill (g)

Panel A - Abnormal operating earnings before interest and tax (OXAA)

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<th>OXAA* ep</th>
<th>OA* ac</th>
<th>OA* go</th>
<th>OA* go * ac</th>
<th>OA* ep * ac</th>
<th>Adj R-sq</th>
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Panel B - Abnormal operating earnings before interest but after tax (OXAB)

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<th>OXAB* ep</th>
<th>OA* ac</th>
<th>OA* go</th>
<th>OA* go * ac</th>
<th>OA* ep * ac</th>
<th>Adj R-sq</th>
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Panel C - Abnormal operating earnings before interest but after tax and extraordinary items (OXAC)

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</tr>
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</table>

* significant at 1% level  ^ significant at 2% level

t-statistics are in parentheses

Variable Definition

g = goodwill of year t, calculated as market value (P) minus book equity value (BV)
OXAA = abnormal operating earnings before interest and tax of year t
OXAB = abnormal operating earnings before interest but after tax of year t
OXAC = abnormal operating earnings before interest but after tax and extraordinary items of year t
OA = net operating assets at end of year t
OXAA* ep = interaction variable of abnormal operating earnings OXAA and ranked earnings persistence, where ep = 1, 2 or 3
OXAB* ep = interaction variable of abnormal operating earnings OXAB and ranked earnings persistence, where ep = 1, 2 or 3
OXAC* ep = interaction variable of abnormal operating earnings OXAC and ranked earnings persistence, where ep = 1, 2 or 3
OA* ac = interaction variable of net operating assets and ranked accounting conservatism, where ac=1, 2 or 3
OA* go = interaction variable of net operating assets and ranked growth, where go=1, 2 or 3
OA* go * ac = interaction variable of net operating assets, ranked growth and ranked accounting conservatism
OA* ep * ac = interaction variable of net operating assets, ranked earnings persistence and ranked accounting conservatism

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Table 7. Pooled regressions of fixed assets (FA) proportion and remaining FA life, with Industry & year dummies

Panels A-C show the pooled results over 90-95, using four test models and three variants of abnormal operating earnings
Dependant variable = Goodwill (g)

Panel A – Abnormal operating earnings before interest and tax (OXAA)

<table>
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<tr>
<th>Predicted Sign</th>
<th>INTERCEPT</th>
<th>OXAA</th>
<th>OA</th>
<th>OA* rfa</th>
<th>OA* rfa * ac</th>
<th>OA* rlife</th>
<th>OA* rlife * ac</th>
<th>Adj R-sq</th>
</tr>
</thead>
<tbody>
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<td>10.147*</td>
<td>0.173*</td>
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<td></td>
<td>-0.325*</td>
<td>0.497</td>
</tr>
<tr>
<td></td>
<td>(12.459)</td>
<td>(40.083)</td>
<td>(28.302)</td>
<td>(-20.155)</td>
<td></td>
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<tr>
<td>M4</td>
<td>41442.910*</td>
<td>10.042*</td>
<td>0.848*</td>
<td></td>
<td></td>
<td></td>
<td>-0.082*</td>
<td>0.516</td>
</tr>
<tr>
<td></td>
<td>(12.392)</td>
<td>(42.062)</td>
<td>(26.504)</td>
<td>(-15.985)</td>
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</table>

Panel B – Abnormal operating earnings before interest but after tax (OXAB)

<table>
<thead>
<tr>
<th>Predicted Sign</th>
<th>INTERCEPT</th>
<th>OXAB</th>
<th>OA</th>
<th>OA* rfa</th>
<th>OA* rfa * ac</th>
<th>OA* rlife</th>
<th>OA* rlife * ac</th>
<th>Adj R-sq</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>61613.360*</td>
<td>6.317*</td>
<td>0.533*</td>
<td>0.124*</td>
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<td></td>
<td>(15.896)</td>
<td>(13.605)</td>
<td>(13.446)</td>
<td>(6.937)</td>
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</tr>
<tr>
<td>M2</td>
<td>62159.030*</td>
<td>6.115*</td>
<td>0.561*</td>
<td>0.054*</td>
<td></td>
<td></td>
<td>-0.400*</td>
<td>0.362</td>
</tr>
<tr>
<td>M3</td>
<td>56571.450*</td>
<td>6.231*</td>
<td>1.691*</td>
<td></td>
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<td></td>
<td>-0.400*</td>
<td>0.410</td>
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<tr>
<td></td>
<td>(15.189)</td>
<td>(13.976)</td>
<td>(36.713)</td>
<td>(-22.369)</td>
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<tr>
<td>M4</td>
<td>58944.140*</td>
<td>6.526*</td>
<td>1.192*</td>
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<td></td>
<td>-0.087*</td>
<td>0.381</td>
</tr>
<tr>
<td></td>
<td>(15.454)</td>
<td>(14.274)</td>
<td>(33.879)</td>
<td>(-15.010)</td>
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Panel C – Abnormal operating earnings before interest but after tax and extraordinary items (OXAC)

<table>
<thead>
<tr>
<th>Predicted Sign</th>
<th>INTERCEPT</th>
<th>OXAC</th>
<th>OA</th>
<th>OA* rfa</th>
<th>OA* rfa * ac</th>
<th>OA* rlife</th>
<th>OA* rlife * ac</th>
<th>Adj R-sq</th>
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<tbody>
<tr>
<td>M1</td>
<td>59302.900*</td>
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<td>0.629*</td>
<td>0.105*</td>
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<tr>
<td></td>
<td>(15.348)</td>
<td>(12.860)</td>
<td>(16.539)</td>
<td>(5.894)</td>
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</tr>
<tr>
<td>M2</td>
<td>59742.729*</td>
<td>5.969*</td>
<td>0.631*</td>
<td>0.051*</td>
<td></td>
<td></td>
<td>-0.406*</td>
<td>0.361</td>
</tr>
<tr>
<td></td>
<td>(15.555)</td>
<td>(12.687)</td>
<td>(19.576)</td>
<td>(7.367)</td>
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<td>6.430*</td>
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<td>-0.406*</td>
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<tr>
<td></td>
<td>(14.650)</td>
<td>(14.249)</td>
<td>(30.965)</td>
<td>(-22.090)</td>
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<td>6.419*</td>
<td>1.249*</td>
<td></td>
<td></td>
<td></td>
<td>-0.08637*</td>
<td>0.385</td>
</tr>
<tr>
<td></td>
<td>(14.845)</td>
<td>(15.860)</td>
<td>(36.345)</td>
<td>(-14.820)</td>
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</table>

* significant at 1% level  
 t-statistics are in parentheses

Variable definition

- \( g \) = goodwill of year t, calculated as market value (P) minus book equity value (BV)
- OXAA = abnormal operating earnings before interest and tax of year t
- OXAB = abnormal operating earnings before interest but after tax of year t
- OXAC = abnormal operating earnings before interest but after tax and extraordinary items of year t
- OA = net operating assets at end of year t
- OA* rfa = interaction variable of net operating assets and ranked proportion of fixed assets to total assets, where \( rfa = 1, 2 \) or \( 3 \)
- OA* rfa * ac = interaction variable of net operating assets, ranked proportion of fixed assets to total assets and ranked accounting conservatism, where \( ac = 1, 2 \), or \( 3 \)
- OA* rlife = interaction variable of net operating assets and ranked remaining useful life of fixed assets, where \( rlife = 1, 2 \) or \( 3 \)
- OA* rlife * ac = interaction variable of net operating assets, ranked remaining useful life of fixed assets and ranked accounting conservatism
SECOND ESSAY

VALUATIONS OF

DISCRETIONARY ACCRUALS:

JAPANESE EVIDENCE
SECOND ESSAY - VALUATIONS OF DISCRETIONARY ACCRUALS: JAPANESE EVIDENCE

ABSTRACT

This second essay of the thesis examines the valuation effects of positive vs. negative earnings, book value and discretionary accruals, using a sample of Japanese listed firms over the period of 1975-1995. Consistent with US evidence such as Hayn (1995), Jan and Ou (1995) and Collins et al. (1999), omission of book value from the simple earnings capitalization model causes Japanese stock prices to be negatively, though insignificantly, associated with losses but significantly positively associated with profits. The negative price-earnings association is weaker for Japanese loss firms while the positive price-earnings association is much stronger for profit firms, compared with US evidence. This is consistent with extant literature documenting the pervasive use of more conservative accounting practices by Japanese firms than by US firms, and the stock bubble of the Japanese market.

The negative price-earnings association for loss firms is reversed when book value of equity is added as an omitted correlated explanatory variable. Book value is value-relevant and has incremental explanatory power beyond earnings. Moreover, its omission causes a positive bias of the coefficient on positive earnings. Results also reveal that investors value earnings (book value) more than book value (earnings) for profit (loss) firms. This is because investors view losses as transitory whereas book value reflects the abandonment value of loss firms, consistent with Collins et al. (1999) and Burgstahler and Dichev (1997), among others.
Lastly, evidence suggests that the Japanese market prices discretionary accruals, which enhance the value relevance of reported earnings. They signal managers’ private information on firm profitability and help smooth income in a way desirable by investors. Results are robust to various sensitivity checks including foreign investors’ holdings, firm size, the level of debt financing and strength of Keiretsu ties. Overall, discretionary accruals are more significantly priced in Japan than in the US, this is consistent with the unique corporate governance of Japan. The joint ownership of debt and equity by financial institutions, interlocking ownership, significant inter-group (Keiretsu) holdings, together with group management dynamics result in far closer ties and less information asymmetry between Japanese investors and management (Ho et al., 2000; Jacobson and Aaker, 1993; Kagono et al., 1983). Hence there is less incentive for managerial opportunism in Japan than in the US, rendering discretionary accruals relatively more informative and significantly priced by the Japanese market.
CHAPTER EIGHT: INTRODUCTION

Background, Motivation and Objectives

Before 1970's, research in investment analysis was focused mainly on fundamental analysis to determine share price based on available (mainly accounting) information. As such, financial accounting research adopts the so-called measurement perspective to evaluate accounting concepts as determinants of asset values and hence investment values. However, traditional fundamental analysis and accounting measurement theory have been viewed as ad hoc and lacking rigorous theoretical foundations. In the two decades following the 70's, developments have not advanced much beyond the dividend discount and discounted cash flow analyses, which as Penman (1992) points out, have both conceptual and practical deficiencies.

It has been well-established that stock price is the present value of the expected future payoffs (dividends) to holding the stock. However, according to the Miller and Modigliani (1961) dividend irrelevancy proposition, price is unrelated to observed dividends, which are arbitrary and discretionary up to the liquidating dividends. Since liquidating dividends are rarely observed, observed dividends are largely uninformative. Yet stock price is measured by future dividends, this creates the dividend conundrum, as noted by Penman (1982). Likewise, there exists a similar discounted cash flow conundrum. Discounted cash flow analysis follows
from the cash conservation relation.\textsuperscript{31} The estimation target free cash flow, like dividends, is also uninformative about value because ex post cash flows are rarely observable. In contrast, accounting information possesses special attributes, rendering it superior over dividends and cash flow in estimating the intrinsic value of a firm.

Easton and Harris (1991), Easton, Harris and Ohlson (1992) and Ohlson and Penman (1992) provide evidence to support the view of accounting as a system for aggregating value. It is this attribute of accounting as a value accretion and measurement system and the relation of book values with earnings and future dividends that lead one out of the dividend and discounted cash flow conundrums.

While book value is a measure of equity value, earnings is a measure of the change in that value. Under the assumption of clean surplus accounting, all changes in owners’ equity caused by reasons other than capital contribution or dividends payment run through the income statement (Ohlson 1995, Feltham and Ohlson, 1995). Earnings aggregated in the retained earnings become part of the book value of owners’ equity. Dividends, being an appropriation of net earnings, reduce owners’ equity (post-closing book value) but not earnings. Future dividends are paid out of future book value. Thus discounted expected future dividends are equivalent to discounted expected future cum-dividend book value, which in effect represents stock price. Therefore one might start with net earnings or book value to value a firm.

\textsuperscript{31} The cash conservation relation is: $C_t + B_t = d_t + I_t$, where $C_t$ is cash flow from operations, $B_t$ is cash borrowings, $I_t$ is cash investment and $d_t$ is dividends, and can be payments to shareholders or capital contributions from them.
Starting from current earnings, Ryan (1986) and Ohlson (1995) show that, under certain assumptions, price is simply capitalized current earnings. Among others, Daley (1984), Kothari (1992), Kothari and Zimmerman (1995) use the simple earnings capitalization model to measure firm value. Such research typically assumes a positive and homogeneous association between price and earnings, irrespective of the magnitude and sign of earnings. However, increasingly more evidence emerges to overturn this assumption. For example, Hayn (1995) finds that reported losses are more weakly associated with returns than reported profits. She suggests that it is because investors perceive losses as temporary and less informative than profits. If losses persist, investors can always cut losses by liquidating the firm. Jan and Ou (1995) find opposite price-earnings association between profit and loss firms. While the earnings coefficients for profit firms are significantly positive and are consistent with prior results, significantly negative coefficients are obtained for loss firms. Collins, Pinus and Xie (1999) further confirm the negative relation between price and losses. They attribute this anomalous negative relation to the omission of book value of equity from the simple earnings capitalization model. They further provide evidence that the misspecification of simple earnings capitalization model causes a positive bias of the earnings coefficient for profit firms. When book value of equity is included, significantly positive earnings coefficients are obtained for loss firms. Also, book value has significant incremental explanatory power beyond earnings for both profit and loss firms. Furthermore, they find that book value has incremental information content over earnings to proxy for expected future normal earnings and liquidation value for loss firms. This is consistent with Penman (1992), Ohlson (1995), and Feltham and Ohlson (1995), which maintain that book value proxies for expected future normal earnings; and with Berger, Ofek and
Swarey (1996), Barth, Beaver and Landsman (1996) and Burgstahler and Dichev (1997), which conclude that book value proxies for adaptation or abandonment value.

The importance of earnings as a summary measure of firm performance can be seen by its wide use in investment assessments by financial analysts, investors and creditors, and in contracting debt covenants, executive employment, and compensation plans, etc. Given that earnings is produced under the accrual accounting process, prior studies of the informativeness of accruals and cash flows typically decompose accounting earnings into cash flow from operations, current accruals and noncurrent accruals (see, e.g., Wilson, 1986 and 1987; Rayburn, 1986; and Bowen, Burghstahler and Daley, 1987). There is an extensive literature exploring the role of accruals and cash flows to reflect firm performance. The Financial Accounting Standards Board (FASB) takes the stance that accruals will better reflect firm performance than cash flows. For instance, Statement of Financial Accounting Concepts No.1 states that:

"Information about enterprise earnings and its components measured by accrual accounting generally provides a better indication of enterprise performance than does information about current cash receipts and payments." (Paragraph 44)

However, empirical research gives mixed evidence as to which component of earnings, accruals or cash flows, is a better indicator of firm performance. For example, Bowen et al. (1987), Dechow (1994), Barth, Cram and Nelson (1999) find that accruals, on average, have incremental information content over cash flows. Accruals can mitigate the timing and mismatching problems in measuring short-term
cash flows and hence can better improve the ability of earnings to measure firm performance. On the other hand, Wilson (1986, 1987) find that price reacts more to cash flows than to accruals while Bernard and Stober (1989) find little evidence of either component providing incremental information to explain price variation.

Holthausen and Leftwich (1983), Watts and Zimmerman (1986), Holthausen (1990), Healy and Palepu (1993) maintain that managerial discretion could improve the value relevance and informativeness of earnings if it represents a credible signal of manager's private information about future profitability. However, to the extent that managers opportunistically manage accruals, reported earnings would be distorted (Healy, 1985; Watts and Zimmerman, 1986; Healy and Palepu, 1993).

To provide further evidence on the nonhomogeneous association between price and earnings, this second essay of the thesis tests the differential valuation impact of positive and negative earnings, using a sample of Japanese listed firms for the period 1975 to 1995. In so doing, I frame empirical tests within the context of Collins et al. (1999). Both cross-sectional regressions by year and cross-sectional time-series pooled regressions over the entire period of 1975 to 1995 are used and consistent results are obtained. Results support the US evidence, though a lesser extent of anomalous negative price-earnings relation is found for loss firms. Coefficient on earnings for loss firms is insignificantly negative while the same is strongly positive and highly significant for profit firms. The weaker negative price-earnings association for Japanese loss firms and the stronger positive price-earnings association for profit firms are consistent with extant literature studying the Japanese
market. The pervasive use of more conservative accounting practices by Japanese firms than their US counterparts, and the stock bubble of the Japanese market contribute to this difference between Japan and US evidence.

I also test the misspecification of the simple earnings capitalization model by adding beginning book value of equity in the price-earnings regression. The coefficient on book value is significantly positive for the full sample, indicating that book value has value relevance for equity valuation. Also, its inclusion increases the adjusted R-square by 11%, it has incremental explanatory power beyond earnings in explaining the variation of price. When the sample is segregated into profit and loss firms, results follow a similar trend, revealing the value relevance and incremental explanatory power of book value. In addition, a significantly positive earnings coefficient is obtained for loss firms while the magnitude and significance level of the positive earnings coefficient of profit firms are reduced. This suggests that the omission of book value causes a negative bias of the earnings coefficient of loss firms but a positive bias of the same for profit firms. The coefficient on book value (earnings) is more significantly positive for loss (profit) firms, indicating that book value plays a more important role for loss firms while earnings is more informative for profit firms. All these corroborate the evidence of Collins et al. (1999), Burgstahler and Dichev (1997), Berger et al. (1996), and Barth et al. (1996), which conclude that book value proxies for adaptation or abandonment value for loss firms. Results are also consistent with the equity valuation models discussed in Penman (1992), Ohlson (1995) and Feltham and Ohlson (1995).
I further test the pricing of discretionary accruals by segregating reported earnings (or losses) into their cash flow, discretionary and nondiscretionary accrual components, using the cross-sectional Jones (1991) model. Given that book value has value relevance incremental to earnings, I also include beginning book value in the price regression. Again, both cross-sectional regressions by year and cross-sectional time-series pooled regressions over the entire period of 1975 to 1995 are used and similar conclusions are reached from either results. Consistent with Subramanyam (1996) and Dechow (1994), coefficients on discretionary accruals are significantly positive, reflecting that the market prices discretionary accruals as an informative measure of firm performance. This supports the information asymmetry perspective, i.e., managers signal their superior, private information to the market about future profitability of their firms. Besides, both cash flow and nondiscretionary accruals have significantly positive coefficients, indicating that they are value relevant as well. Coefficients on discretionary accruals in most years, and on average, are more significantly positive than those on nondiscretionary accruals, suggesting that investors view management’s discretionary accounting choices enhance the value relevance of earnings. However, there is no evidence that discretionary accruals are superior over cash flows as a measure of firm performance, as documented in Bowen et al. (1987) and Dechow (1994). In fact coefficients on operating cash flows are slightly more positive than those on discretionary accruals.

Overall, discretionary accruals are more significantly priced in Japan than in the US, this can be explained by the unique corporate governance of Japan. The joint ownership of debt and equity by financial institutions in Japan helps alleviate information asymmetry (Ho, Jiang and Kim; 2000). Significant cross-business
holding and financial institutions holding, coupled with group dynamics of
management, result in far closer ties between investors and management. There are
more frequent interactions, information and risk sharing between investors and
managers. Hence there is less incentive for opportunistic earnings management in
Japan than in the US. Therefore discretionary accruals are relatively more
informative and credible and hence more significantly priced by the market in Japan.

Finally, the results are robust to various sensitivity checks. First, I look at the effect
of foreign holdings. Foreign investors, who are less familiar with the local capital
market, tend to invest in companies with a lower degree of information asymmetry
and higher disclosure quality (Jiang and Kim, 2000). I segregate the sample firms
into high and low foreign-holding groups and find that, as expected, discretionary
accruals are more significantly priced for the high foreign-holding group. Next, the
effect of firm size is explored. More analysts tend to follow large firms, which have
better disclosure quality than small firms (e.g., Atiase, 1980, 1985 and 1987;
Bhushan, 1989; Dempsey, 1989; Lang and Lundholm, 1996). Results support this
argument, discretionary accruals are more significantly priced for big firms than small
firms. Third, I examine the impact of debt financing on firm valuation. Japanese
firms are characterized by high debt financing (Nakatani, 1984). Faced with financial
distress, managers of firms with high debt ratio might engage more in earnings
management. This distorts the reported earnings and reduces its information content.
It is therefore not surprising to find that the coefficient on discretionary accruals is
significantly more positive for firms with low debt ratio than those highly geared
firms. Lastly, the effect of information asymmetry is studied. Since information is
shared among members of a Keiretsu, there should be less information asymmetry
between managers and the capital market (Jacobson and Aaker, 1993; Kang and Shivdasani, 1995; Ho et al., 2000). Hence, the disclosure quality of strongly cross-held firms should be higher. Results are consistent with this hypothesis. Discretionary accruals for companies with strong Keiretsu ties have significantly more positive coefficient, compared with independent firms and firms with mixed ties.

Corporate Governance in Japan

Unlike North America where shareholder is the main stakeholder of a corporation, corporate governance in Japan is characterized by a complex network of implicit and explicit contracts among diverse stakeholders (Kester, 1991). Cross-corporate and interlocking ownership is common among businesses. In particular, financial institutions or other companies hold a significant proportion of the shares of large corporations in Japan. For example, Hodder and Tschoegl (1993) report that up to two thirds of the shares of Japanese listed firms are held by other firms. Bae and Kim (2000) find that, on average, about 31% of their sample firms are cross-held by corporate shareholders, such as business partners and affiliated companies, during the 20-year period from 1976 to 1996. These cross-held shareholders rarely trade their shares in the market. Shares are owned for maintaining long-term business affiliations with other corporations, and not for short-term capital gains (Jacobson and Aaker, 1993; Cooke, 1997; Bae and Kim, 1998). Japanese financial institutions, especially commercial banks and life insurance companies are allowed to be both shareholders and creditors of the same corporate groups. In contrast, this is prohibited in the US, financial institutions are restricted from holding shares of client
companies to which they lend\textsuperscript{12}. Various State and Federal regulations also effectively discourage US life insurance companies from acquiring significant equity interests in US corporations (Cummins, 1977 and Prowse, 1990).

In Japan, placement of personnel within corporate groups (called \textit{Keiretsu}) is common, as well as reciprocal shareholding and trading agreements, information sharing, selective intervention and implicit contracting. There have been two types of Keiretsu. The old ‘Zaibatsu’ were large, family-owned industrial conglomerates dominating vital industries, examples include Mitsubishi Group, Mitsui Group, and Sumitomo Group. The function of accounting to present financial information to investors of these Zaibatsu was irrelevant. After the Second World War, the Allied Command directed the dismembering of Zaibatsu to allow public investors to own shares in the business to build a democratic economy and raise industrial capital (Someya, 1996). The other type of Keiretsu, existing up till today, normally consists of a financially affiliated group centered on an influential commercial bank, e.g., Dai-Ichi Kangin Group, Fuyo Group and Sanwa Group. These group companies rely financially on loans from the main affiliated bank and the crossholdings of each other’s shares. This creates a strong bond among member firms to resist take-over (Sheard, 1989, 1991 and 1992; Aoki and Sheard, 1992). In addition, Keiretsu exercise exclusionary rules to ensure that competition within the group does not occur. They seek to have one and only one company in each major industry (Miyazaki, 1976). This exclusionary practice dominated until early 1980s when members of the European Community intervened to allege that Japan’s economy and

\textsuperscript{12}For instance, the Glass-Steagall Act of 1933 prohibits all Federal Reserve member commercial banks from owning equity interests in US corporations.
trade violated the principles of free trade under the General Agreement on Tariffs and Trade (Cooke, 1997).

In terms of corporate management and leadership style, Japan also differs from the US. Kagono et al. (1983) point out that ‘bureaucratic dynamics’ is common in US management whereas ‘group dynamics’ is a key feature of Japanese management. Bureaucratic dynamics is featured by hierarchical decision and implementation, with formal organizational structure and established rules. On the other hand, group dynamics is characterized by group decision making and implementation, there is frequent interaction among members of the organization together with sharing of information, values and risk. The operation of a Keiretsu reflects indeed the principles of ‘group dynamics’. Information is disseminated within group members, which form information clubs, with non-keiretsu shareholders excluded. Outsiders are unable to observe the behavior of those within the network since shareholdings are held for long-term, group companies do not trade on their privileged knowledge (Cooke and Kiuya, 1992). Risks are shared positively within the group companies to a larger extent than outside shareholders. Companies within a group enjoy close ties in personnel, finance and business transactions (Kajiura and Kosuga, 1987). As such, Japanese firms are well known for employing high debt financing for their operations since they can raise loans and other bank facilities relatively easier from group members, though at higher costs (Caves and Uekusa, 1976; Nakatani, 1984). Japanese financial institutions are often major shareholders as well as creditors of
interlocked corporate groups. Aoki (1988) classifies the high debt costs as agency fees paid by shareholders for bank monitoring.

Given the unique institutional environment, corporate governance, ownership and corporate finance structure of Japanese firms, it is interesting to examine if these institutional factors differentially affect the role of accounting fundamentals in equity valuation. Aoyama (1994, p.103) opines that, “Although the Japanese market represents approximately 30% of the global market, Western institutional investors still seem unsure to what extent and in what manner to invest in Japan, partly because they do not always have sufficient accurate information on or knowledge of the pricing mechanisms in the Japanese markets.” To the best of my knowledge, few studies have attempted to examine the implications of negative earnings and the misspecification of the simple earnings capitalization model, as Collins et al. (1999) do, in the context of Japanese markets. Providing evidence on whether and how the market prices (1) positive vs. negative earnings; (2) book value of equity in the presence of profits vs. losses; and (3) discretionary accruals, could improve our understanding of the manner in which the capital market processes accounting information. It could also provide insights into whether the Japanese market prices stocks differently, as compared to its western counterparts. Japanese stocks were abnormally overpriced throughout the 1980’s, with extremely high price-to-earnings and price-to-book ratios over other major countries in the world (Aoyama, 1994; Bae and Kim, 1998). It remains an empirical question whether the Japanese market prices stocks rationally against their earnings and book values fundamentals. Evidence provided could also help researchers and financial analysts better

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understand the nature of discretionary accruals and the economic incentives underlying management’s discretionary accounting choices. Finally, this paper provides evidence that discretionary accruals improve communication and disclosure of the firm’s financial performance. This might provide insights for accounting standards setting bodies into the choice of uniformity versus flexibility that should be allowed in accounting standards.
CHAPTER NINE: LITERATURE REVIEW

Discretionary Accruals, Signaling and Earnings Management

The role accruals play in measuring firm performance has been extensively studied in accounting research. Different theories and empirical evidence have emerged, providing alternative and sometimes conflicting views on the usefulness of accruals for firm valuation. Bowen, Burghstahler and Daley (1987) find that accruals, on average, have incremental information content over cash flows. Dechow (1994) also finds that accruals outperform cash flows in improving the ability of earnings to measure firm performance. Accruals can mitigate the temporary timing and matching problems in cash flows. Barth, Cram and Nelson (1999) provide evidence that, by allowing the cash and accrual components of earnings to have different multiples, current and past earnings perform much better than current and past cash flows in explaining the variation in future cash flows. Segregating the accrual component of earnings further accentuates the predictive power of earnings for future cash flows.

On the other hand, Wilson (1987), based on the stock price behavior during a nine-day interval around the release of annual reports in 1981 and 1982, concludes that, for a given amount of earnings, the market reacts more favorably when the cash flow (accrual) component is larger (smaller). Bernard and Stober (1989), using a larger sample, extend the work of Wilson over 32 quarters and include industry-based time series cross-sectional pools to allow the model parameters to vary by industry. They
confirm a larger price reaction to cash flows than to accruals for the same two-quarter period in Wilson’s test but not for the overall period of 1977-1984. They also fail to get successful results by using progressively more contextual models to test the implications of cash flows and accruals. Sloan (1996) concludes that stock prices fail to reflect fully information contained in the accrual and cash flow components of current earnings. Prices act as if investors fixate on earnings.

Given the flexibility of the Generally Accepted Accounting Principles (GAAP), managers usually have some discretion over the recognition of accruals. Such discretion can enhance as well as distort the informativeness of earnings, depending on management’s motives. Managers can use discretionary accruals to signal their private information to the market (Holthausen and Leftwich, 1983; Watts and Zimmerman, 1986; Holthausen, 1990; Healy and Palepu, 1993; Subramanyam, 1996) as well as to opportunistically manipulate earnings (Healy, 1985; Watts and Zimmerman, 1986; Healy and Palepu, 1993). Since management is presumed to have superior information about the firm’s future profits and cash generating ability, signaling can enhance the informativeness of earnings in measuring firm performance. A credible signal will thus reduce information asymmetry and contracting costs. Moreover, managers may choose accounting policies to smooth earnings to align market expectations, and even to increase earnings persistence (Hand, 1989). Income smoothing can enhance the informativeness of earnings if they are smoothed to mitigate the timing and mismatching problems of transitory cash flows (Chaney, Jeter and Lewis, 1996).
Alternatively, managers may use their discretion to choose accounting policies that maximize their own utility, at the expense of the utility of the firm and other claimholders on the firm. For example, managers rewarded on earnings-based bonus contracts have incentives to choose income-increasing accruals to inflate their bonus compensation (Healy, 1985; Holthausen et al., 1995). In general, managers manipulate discretionary accruals to hide poor performance or postpone a portion of exceptionally good current earnings to future periods (see, e.g., Healy, 1985; DeAngelo, 1988; Bae and Kim, 2000). When managers opportunistically manipulate accruals, reported earnings become less informative and reliable. Then cash flows would become the preferred measure of firm performance. Therefore, whether accruals have a net positive or negative effect on measuring firm performance is an empirical question and would depend on the behavior and motives of management. Hunt, Moyer and Shevlin (1995) document a positive relation between the price-earnings multiplier and the extent of income smoothing. Warfield, Wild and Wild (1995), on the other hand, find a negative association between the informativeness of earnings and the extent of accruals management.

Although Bowen et al. (1987) and Dechow (1994) document that accruals are superior over cash flows in measuring firm performance, they have not established whether such superiority is caused by, or in spite of, the discretionary accounting choices of management. The value relevance of discretionary accounting choices on earnings remains relatively unexplored (Subramanyam, 1996). Mixed evidence has been obtained for the effects of managerial discretion on the pricing of earnings. Further evidence is required to explore whether the market prices discretionary accruals.
Measurement of Discretionary Accruals

A number of models have been established for measuring discretionary accruals. These models typically start with total accruals. Then researchers assume a model which explains and predicts the nondiscretionary component of total accruals. The discretionary component is then estimated as the residual balance. Healy (1985) and DeAngelo (1986) use total accruals from the estimation period to proxy for expected nondiscretionary accruals. Their models will measure nondiscretionary accruals accurately if they are constant over time and discretionary accruals have a zero mean in the estimation period. However, Kaplan (1985) points out that these assumptions are invalid. For example, when there are changes in economic circumstances, nondiscretionary accruals would change. Improving on Healy (1985) and DeAngelo (1986), Jones (1991) develops a model to measure nondiscretionary accruals by relaxing the assumption of constant nondiscretionary accruals. The Jones model estimates total accruals (AC) as a function of changes in revenue, and the level of property, plant and equipment, see equation 1 below. The fitted value of equation 1 represents nondiscretionary accruals (NDC, see equation 2) whereas the residual is discretionary accruals (DC, see equation 3).

(1) $AC_{it} / TA_{it-1} = a_0 (1 / TA_{it-1}) + a_1 (\Delta REV_{it} / TA_{it-1}) + a_2 (\text{PPE}_{it} / TA_{it-1}) + \nu_{it}$

(2) $NDC_{it} = a_0 (1 / TA_{it-1}) + a_1 (\Delta REV_{it} / TA_{it-1}) + a_2 (\text{PPE}_{it} / TA_{it-1})$

(3) $DC_{it} = AC_{it} / TA_{it-1} - NDC_{it}$

where

$NDC_{it} =$ non-discretionary accruals of firm i in year t

$DC_{it} =$ discretionary accruals of firm i in year t

$AC_{it} =$ total accruals of firm i in year t

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\[ \Delta \text{REV}_i = \text{revenues in year } t \text{ less revenues in year } t-1 \text{ of firm } i \]
\[ \text{PPE}_i = \text{gross property, plant and equipment in year } t \text{ of firm } i \]
\[ \text{TA}_{i,t-1} = \text{total assets of firm } i \text{ in year } t-1 \]
\[ a_0, a_1, a_2 = \text{firm-specific parameters} \]

Dechow, Sloan and Sweeney (1995) modify the Jones Model to correct for potential measurement error over discretionary accruals when earnings management is exercised through discretionary revenues. The Modified Jones Model is given below:

(4) \[ \frac{\text{AC}_i}{\text{TA}_{i,t-1}} = a_0 \left( \frac{1}{\text{TA}_{i,t-1}} \right) + a_1 \left( \frac{\Delta \text{REV}_i - \Delta \text{AR}_i}{\text{TA}_{i,t-1}} \right) + a_2 \left( \frac{\text{PPE}_i}{\text{TA}_{i,t-1}} \right) + \gamma_i \]

(5) \[ \text{NDC}_i = a_0 \left( \frac{1}{\text{TA}_{i,t-1}} \right) + a_1 \left( \frac{\Delta \text{REV}_i - \Delta \text{AR}_i}{\text{TA}_{i,t-1}} \right) + a_2 \left( \frac{\text{PPE}_i}{\text{TA}_{i,t-1}} \right) \]

(6) \[ \text{DC}_i = \frac{\text{AC}_i}{\text{TA}_{i,t-1}} - \text{NDC}_i \]

where \( \Delta \text{AR}_i = \text{net accounts receivable in year } t, \text{ less net accounts receivable in year } t-1 \text{ of firm } i \), and other variables are as defined earlier.

Assuming that the Jones (1991) model correctly decomposes total accruals into their discretionary and nondiscretionary components, Subramanyam (1996) concludes that the market, on average, prices discretionary accruals. He finds that net income better explains changes in prices or stock returns and gives a higher univariate coefficient than nondiscretionary income. Consistent with Dechow (1994), net income also outperforms operating cash flow and Subramanyam attributes a significant proportion of the improvement to the discretionary component. Further, discretionary accruals have incremental information content beyond nondiscretionary accruals. He also tries to test whether the information asymmetry (income smoothing) perspective or
the opportunistic behavior perspective better explains the pricing of discretionary accruals. Evidence suggests that there is pervasive income smoothing and it helps reduce the variability of earnings and improve its persistence and predictability. This is consistent with Chaney et al. (1996), and Hunt et al. (1995). Subramanyam further finds evidence supporting discretionary accruals communicate manager’s private information about the firm’s future profitability. However, he admits that the results may equally be explained by measurement errors of the discretionary accruals.

**Equity Valuation and Anomalous Negative Price-Earnings Relation**

Prior research in equity valuation assumes that earnings reflect information about expected future cash flows and uses the simple earnings capitalization model to express stock price in terms of earnings or components of earnings.\(^{34}\) Mathematically, it can simply be expressed as:

\[
P_t = \alpha + \beta E_t + \epsilon_t
\]

(7)

where \(P_t\) is cum-dividend stock price at time \(t\), and \(E_t\) is earnings per share in period \(t\). For simplicity, I omit the firm-specific subscripts throughout. This approach typically assumes that the price-earnings relation is both positive and homogeneous over the entire range of earnings realizations. Kothari and Zimmerman (1995) evaluate the relative merits of the return-earnings vs. price-earnings models in firm valuation. Assuming that earnings follows a random walk and stock price leads earnings, they show that the coefficient on earnings is biased towards zero in the return model while it is unbiased in the price model. However, recent studies provide evidence contrary

\(^{34}\) See, for example, Kothari and Zimmerman (1995), Kothari (1992), and Daley (1984).
to the assumptions of a positive and homogeneous relation between price and earnings across profits and losses, and the claim of unbiased earnings coefficient in the simple earnings capitalization model. For instance, Hayn (1995) segregates firms into profit and loss firms according to whether they report positive or negative earnings, and finds that the cross-sectional return-earnings relation for loss firms is much weaker than that for profit firms. She interprets this weaker relation as a reflection of the market perceiving losses to be transitory. Shareholders of loss firms have a liquidation choice, so losses are not expected to perpetuate, and thus are less informative than profits about the firm's future prospects. She also finds weaker return-earnings associations for firms signaling sufficiently low future earnings. Here again, investors find the liquidation option more attractive if such low positive earnings persist. Similarly, Jan and Ou (1995) conclude a non-homogeneous price-earnings relation across profit and loss firms. More specifically, they find a reliably negative relation for loss firms. The coefficients on earnings are significantly negative in 18 out of 19 years for loss firms. Furthermore, a similar anomalous relation can also be inferred from Burgstahler and Dichev (1997) and Kothari and Zimmerman (1995).

More recently, Collins, Pinus and Xie (1999) investigate and provide an explanation for the anomalous negative price-earnings relation found in the simple earnings capitalization model for loss firms. They postulate and prove that the anomalous negative price-earnings relation is caused by a correlated omitted variable problem. When they include book value of equity in the simple earnings capitalization model, the negative relation is reversed. In addition, they provide evidence on three competing explanations for the role of book value of equity in valuing loss firms.
These explanations include: (1) a control for scale differences, as per Barth and Kallapur (1996); (2) a proxy for expected future normal earnings, as proposed by Penman (1992) and Ohlson (1995); and (3) a proxy for adaptation or abandonment value for loss or liquidating firms, as documented in Berger et al. (1996), Barth et al. (1996) and Burgstahler and Dichev (1997). Their results do not suggest that book value of equity plays the role of a control for scale differences. Instead, book value serves as a value-relevant proxy for expected future normal earnings and for abandonment value for loss firms facing liquidity problems.

The Collins, Pinus and Xie Framework

Following Jan and Ou (1995), Collins et al. (1999) test the simple earnings capitalization model cross-sectionally over the 1975-1992 period, using profit vs. loss firms. They confirm the negative price-earnings relation for loss firms\(^{35}\), and obtain positive relation for profit firms and all firms pooled together. Results for the loss firms are robust to various sensitivity checks. Excluding transitory elements from the earnings, substituting ex-dividend price for cum-dividend price, deleting samples with reverse stock splits\(^{36}\), and using stock prices at the end of fiscal year \(t\) to two months after \(t\) do not change the results. On the other hand, the coefficient on earnings is significantly more positive for profit firms than for all firms in all 18 years, indicating that the positive coefficient for the combined sample masks the underlying difference between the earnings coefficient for profit and loss firms.

\(^{35}\) The coefficients on earnings for loss firms are negative for all 18 years and are all significant except for 2 years. The mean over the 18 annual regressions is also significantly negative.

\(^{36}\) Reverse stock split would induce a negative correlation between stock price and losses.
Collins et al. hypothesize that the negative price-earnings relation for loss firms is caused by the omission of book value of equity from the model. They convert Ohlson’s (1995) valuation model into one that involves current earnings (instead of abnormal earnings) and beginning-of-year book value of equity (as opposed to end-of-year book value) as follows:

\[ P_t = \alpha + \beta E_t + \gamma B_{t-1} + \epsilon_t \]

where \( P_t \) is cum-dividend stock price at time \( t \), \( E_t \) is earnings available to shareholders per share and \( B_{t-1} \) is the book value of equity per share at the end of fiscal year \( t-1 \). They replace the other information variable in Ohlson’s model with an intercept and an error term. Results confirm their hypothesis: the coefficient on earnings for loss firms is significantly positive overall, and in 6 out of 18 years, but never significantly negative. In addition, the coefficient on book value of equity is positive and highly significant. When book value is included, adjusted R-squares increase significantly from a mean of 9% to 42%, indicating that book value of loss firms has substantial incremental explanatory power beyond earnings in equity valuation.

The value relevance of book value of equity has been identified by a number of prior studies. Ohlson (1995) and Feltham and Ohlson (FO) (1995), drawing on the work

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37 Collins et al. argue that by using end-of-year book value \( bv_t \), as in the Ohlson’s (1995) model, the coefficient on earnings \( x_t \) would capture the direct effect of earnings on stock prices, while the coefficient on \( bv_t \) would capture the indirect effect of earnings on stock prices. This is because \( x_t \) is included as part of \( bv_t \) by the clean surplus relation: \( bv_t = bv_{t-1} + x_t - d_t \), where \( d_t \) is dividends.

38 The intercept allows for non-zero mean pricing effects of the omitted other information, which becomes part of the error term.
of Preinreich (1938) and Edwards and Bell (1961), develop an equity valuation model that relates firm value to two summary accounting measures. They are book value of equity and the present value of expected abnormal earnings. The valuation function of FO demonstrates that the market value of the firm is a positive function of book value of equity, abnormal operating earnings and operating assets. The value relevance of book equity holds irrespective of whether a firm has reported earnings or losses.

Collins et al. further postulate and find that the coefficient on earnings is positively biased for profit firms in the simple earnings capitalization model. The earnings coefficients and significance levels become smaller overall, and in each year, when book equity is added. This differential bias in the earnings coefficient between profit and loss firms results from earnings and book value of equity being correlated differently for profit and loss firms. While stock price and book value are positively correlated for both profit and loss firms, correlation between earnings and book value is positive for profit firms but negative for loss firms. Therefore the bias is more readily detectable for loss firms since it is in the opposite direction of the expected sign of the earnings coefficient.

Consistent with Hayn (1995), they also find that the earnings coefficient is much smaller for loss firms than for profit firms in each year. They argue that the book value of equity is more value-relevant than current earnings for the valuation of loss firms. This is because a firm cannot survive with persistent losses. Thus negative current earnings is less value-relevant than positive current earnings for predicting
expected future earnings whereas book value provides more information about
expected future normal earnings for loss firms. This argument is also supported by
evidence. The mean coefficient on book value for loss firms is 0.47 whereas that for
profit firms is slightly smaller, 0.45.

Following Berger et al. (1996), Barth et al. (1996), and Burgstahler and Dichev
(1997) which use book value as the basis for measuring a firms' liquidation or
abandonment value, Collins et al. postulate that book value is more value-relevant for
loss firms than profit firms as a proxy for abandonment value. Results also support
this. On the other hand, evidence does not support the role of book value as a control
for scale difference, as implied by Barth and Kallapur (1996). Collins et al. replace
book value by alternative proxies for scale, such as total assets and total revenues.
Nevertheless, they do not observe positive coefficient on earnings for loss firms.
Therefore, they reject the possible explanation of book value controls for scale
difference.

The study of Collins et al. (1999) contributes to the equity valuation literature in two
ways. First, they demonstrate that the simple earnings capitalization model is
misspecified due to the omission of book value of equity. More importantly, they
conclude that this omission of book value induces a material bias in the earnings
coefficient. Recent studies such as Easton and Harris (1991), Ohlson (1995), Berger
et al. (1996), Barth et al. (1996) and Burgstahler and Dichev (1997) also assert that
both earnings and book value of equity are value-relevant and thus imply that the
simple earnings capitalization model suffers from an omitted variable problem.
However, they do not suggest that the earnings coefficient is biased due to the omission of book value of equity, as Collins et al. do. The latter provide evidence that omitting book value of equity induces a downward bias in the earnings coefficient for loss firms and an upward bias for profit firms. Second, their study provides new evidence on the role of book value of equity as a value-relevant factor in the event of losses. They maintain that negative earnings are not informative about future operating results of loss firms since negative earnings cannot be sustained indefinitely, otherwise, a firm will cease to exist. They provide evidence that market relies on the book value of equity of loss firms for information about expected future normal earnings and liquidation value. The relative importance of these two roles depends on whether the firm is likely to survive or cease to operate.
Statements of Main Hypotheses

Kothari and Zimmerman (1995) maintain that the coefficient on earnings in the simple earnings capitalization model (Eq. 7) is unbiased. They assume that stock price leads earnings, which follows a random walk process. Therefore, anticipated future earnings is reflected in stock price but uncorrelated with current earnings. As such, the omission of anticipated future earnings from the simple earnings capitalization model would not cause a bias in the coefficient on earnings. Recently, new evidence suggests that the earnings coefficient is biased and the price-earnings relation is nonhomogeneous across profit vs. loss firms. Negative coefficients on earnings are either inferable or directly found for loss firms (Hayn, 1995; Jan and Ou, 1995; Burgstahler and Dichev, 1997; Collins et al., 1999). To test whether this anomalous negative relation also exists in the Japanese market, I develop the first hypothesis as follows:

\[ H1: \text{The market value of a profit (loss) firm at time } t \text{ is a positive (negative) function of current earnings in period } t, \text{ in a simple earnings capitalization model.} \]

Collins et al. (1999) show that the anomalous negative price-earnings relation found in the simple earnings capitalization model for loss firms is caused by the omission of a correlated variable, the book value of equity. Inclusion of book value eliminates the anomaly and generates significantly positive earnings coefficients for both profit and
loss firms. Penman (1992) analyses the role of accounting in firm valuation and evaluates prior research that contributes to the conceptual development of fundamental analysis. He explains that financial accounting is a process of tracking the book value of equity. Book value provides a measure of equity value while earnings provides a measure of the change in equity (book) value. More precisely, firm price can be determined by current book value plus a multiple of the book value to recognize the premium or discount, i.e., unrecorded goodwill. Unrecorded goodwill represents the expected future profits (or losses) that have not been recorded as book value through the realization principle. Such idea of reconciling price to book value in terms of current observed information has been explored by Edwards and Bell (1961) and Peasnell (1982). Recently, Ohlson (1995) and Feltham and Ohlson (FO: 1995) develop an equity valuation model that relates firm value positively to book value of equity, abnormal operating earnings and operating assets. Book value has incremental information content beyond profits or losses. The first essay of this thesis tests the FO model with a sample of Japanese listed firms and confirms the positive relation of firm value with current book value and abnormal operating earnings. To further test the value relevance of earnings and book value using Collins et al.'s model (Eq. 8), which is adapted from Ohlson (1995), I hypothesize that:

\[ H2: \text{The market value of the firm at time } t \text{ is a positive function of current earnings in period } t, \text{ and book value of equity at the beginning of period } t, \text{ for both profit and loss firms.} \]
Hayn (1995) maintains that pooling profitable and loss firms together leads to a downward bias in both the estimated earnings response coefficient and the return-earnings association in prior research. She finds that losses are fairly common in her US sample period of 1962 to 1990. The percentage of loss firms jumps up to 25-33% during the later period of 1982-1990. When she excludes the loss firms in estimating the information content of earnings, both the earnings response coefficient and the return-earnings correlation almost triple.

While negative bias in earnings response coefficient for loss firms is documented in Jan and Ou (1995) and inferable from Kothari and Zimmerman (1995) and Burgstahler and Dichev (1997), Collins et al., for the first time, provide evidence that the earnings coefficient is positively biased for profit firms in the simple earnings capitalization model. When book equity is added, earnings coefficients and significance levels become consistently smaller for profit firms. This is because book value and earnings correlate positively for profit firms but negatively for loss firms. To provide further evidence on the value relevance of book value of equity and its differential impact on profit vs. loss firms, I propose the following hypothesis:

\[ H3: \text{The omission of book value of equity from the simple earnings capitalization model causes a negative (positive) bias in the earnings coefficient for a loss (profit) firm.} \]

Since a firm cannot survive with persistent losses, negative current earnings is less value-relevant than positive current earnings for predicting expected future earnings. Instead, book value provides more information about expected future normal earnings for loss firms (Collins et al., 1999). Investors perceive losses as temporary since they
can choose to liquidate the firm rather than suffer from indefinite losses (Hayn, 1995). Furthermore, Burgstahler and Dichev (1997) conclude that the value relevance of book value declines as book return on equity increases. To test the differential valuation effect of positive vs. negative earnings, and the relative importance of book value of equity on profit against loss firms, the following hypotheses are developed:

\[ H4: \text{Other things being equal, the effect of positive (negative) current earnings on the market value of the firm is higher (lower) for a profit (loss) firm.} \]

\[ H5: \text{Other things being equal, the effect of book value of equity on the market value of the firm is higher (lower) for a loss (profit) firm.} \]

Researchers generally hold two different views about the pricing of accruals. First, discretionary component improves the ability of earnings to reflect the intrinsic value of the firm, therefore it should be priced in an efficient market. Under this information asymmetry perspective, managers are assumed to have superior insider information. They can improve the value relevance of earnings by selecting accounting methods to smooth reported income or by communicating (signaling) private information about the future profitability of the firm that is not reflected in historical accounting. A credible signal would reduce information asymmetry and result in more efficient contracting (Holthausen and Leftwich, 1983; Watts and Zimmerman, 1986; Holthausen, 1990; Dechow, 1994; Subramanyam, 1996). Second, discretionary accruals distort earnings because managers opportunistically manipulate earnings to maximize their own wealth instead of firm's wealth (Healy,

Dechow (1994) predicts and confirms that earnings is superior to cash flows as a summary measure of performance for firms having more volatile operating, investment and financing activities. For industries with short operating cycles, both earnings and cash flows are equally useful indicators of firm performance. However, for industries with long operating cycles, earnings is a better indicator. The importance of accruals also increases when the performance measurement interval is shorter, indicating that accruals, especially working capital accruals, can mitigate temporary timing and matching problems of cash flows. To further provide evidence on whether the market prices discretionary accruals, I test the following hypothesis:

\[ H6: \text{The market value of the firm at time } t \text{ is a positive function of discretionary accruals in period } t. \]

Additional Hypotheses

Hall, Hamao and Harris (1994) compare the accounting disclosure quality of firms in the US and Japanese markets and find that Japanese stock prices in the 1980's were largely unrelated to their accounting fundamentals. Japanese stocks were largely overpriced throughout the 1980's, compared to their intrinsic values. The Japanese market is often being criticized as irrational, inefficient and non-competitive, which
deters investment of Western institutional investors (Aoyama, 1994; Bae and Kim, 1998). Under these circumstances, it is not surprising to find that foreign investors in the Japanese equity market prefer to invest in Japanese firms that have high disclosure quality and low information asymmetry (Jiang and Kim, 2000). These foreign investors are mainly institutional investors such as pension funds and mutual funds corporations (Cheung, Kim and Lee; 1999), who are sophisticated information processors. However, they are less informed than cross-corporate shareholders, who enjoy exclusionary information sharing within the cross-held network (Shread, 1989; Cooke, 1997). Hence, foreign investors would likely invest in firms which publish high information quality accounting reports and/or other financial disclosures. As a result, we would expect that firms with high foreign shareholdings should have relatively lower level of information asymmetry between the market and the firms. This is supported by Jiang and Kim (2000), who find that firms with high foreign shareholdings have their earnings performance anticipated by the market in a more timely manner than firms with low foreign shareholdings.

Similarly, firms which provide credible signals to the market through discretionary accruals would have lower information asymmetry and attract foreign investors as well. To the extent that firms are less involved in opportunistic earnings management, their discretionary accruals provide more credible signals to the market for firm valuation. Therefore, one would expect that firms with high foreign shareholdings should have their discretionary accruals more highly valued, given that they are more credible and provide more useful information of firm value and profitability. To further provide evidence on the impact of foreign shareholdings on the value relevance of discretionary accruals, I hypothesize the following:
H7: Other things being equal, the higher is the foreign shareholdings of a firm, the higher is the valuation effect of discretionary accruals.

Atiase (1980) hypothesizes that a firm’s market capitalization is positively related to the timeliness and extent to which preannouncement prices reflect accounting earnings information. Among others, empirical evidence such as Atiase (1985 and 1987), Freeman (1987), and Collins, Rozell and Salatka (1982) support this hypothesis. Bhusan (1989) and Dempsey (1989), and more recently, Lang and Lundholm (1996) further provide evidence that more analysts tend to follow large firms, which have better disclosure quality. Large firms are more widely held and attract more potential transactions business for analysts, rendering the cost of providing analyst services lower. Hence the aggregate supply of analyst services increases. Based on private information acquired, investors are likely to generate more profits by trading on large firms than small firms. Consequently, the aggregate demand for analyst services would also increase with firm size, ceteris paribus. When there are more analysts following a firm, more private information of the firm is collected and processed. At the same time, the firm has higher incentive to release more information and make more credible disclosures as well, or else it has to bear higher subsequent costs for sending incredible signals to the market.

Large firms, on average, release more public information and hence their level of information asymmetry between investors and firms tend to be lower than small firms. Large firms also attract more public or politicians’ attention and, to the extent
that various outside stakeholders closely monitor these firms, their managers will bear higher political, agency and other costs for sending incredible signals to the market. Therefore large firms should have less incentive to opportunistically manage earnings and their discretionary accruals should provide more credible information to investors for firm valuation. I therefore hypothesize that discretionary accruals should be more significantly priced for firms with high market capitalization:

\[ H8: \text{Other things being equal, the higher is the market capitalization of a firm, the higher is the valuation effect of discretionary accruals.} \]

Japanese firms, especially Keiretsu, are characterized by high debt financing since they can raise loans and facilities relatively easily from their affiliated banks and other group members (Caves and Uekusa, 1976; Nakatani, 1984). Japanese banks and life insurance companies often play dual role as creditors and shareholders of interlocked corporate groups (Prowse, 1990 and 1992). Under financial distress, companies with high debt gearing might engage more in earnings management so that more favorable financial positions and earnings are reported (Watts and Zimmerman, 1986). Therefore, an efficient market should discount the discretionary accruals of highly geared firms. To test the differential pricing of discretionary accruals among firms with different levels of debt financing, I hypothesize:

\[ H9: \text{Other things being equal, the higher is the debt to total asset ratio of a firm, the lower is the valuation effect of discretionary accruals.} \]
Jacobson and Aaker (1993) examine the differences in information asymmetry between managers and investors in the US and Japan and conclude that the Japanese stock market incorporates accounting (earnings) information earlier than the US stock market. This is consistent with their hypothesis that Japanese investors, because of their close ties to the businesses, are on average better informed of their investing firms' business activities, financial health and profitability than their US counterparts. This is particularly true for firms with strong Keiretsu ties, given that large portions of investors of Keiretsu firms are cross-corporate shareholders and/or financial institutions such as commercial banks. In these circumstances, managers of Keiretsu firms have less incentive for opportunistic earnings management. Consequently, discretionary accruals of companies with strong Keiretsu ties should be more value-relevant than independent firms. This leads to the last hypothesis:

\textbf{H10: Other things being equal, the valuation effect of discretionary accruals is higher for Keiretsu firms than for independent firms.}
CHAPTER ELEVEN: TEST METHODS

Data and Sample Selection

The initial sample for the study consists of all non-financial firms that were listed on
the Tokyo Stock Exchange for the period 1975 to 1995. Relevant data are extracted
from the 1996 Pacific-Basin Capital Markets (PACAP) databases for Japan. To be
included, firms must have all the necessary accounting and share price data available
for estimating the Jones (1991) and modified Jones models, and other equity
valuation models used in this study. Firms with negative book value of equity or
changes in fiscal year end dates are deleted. Sample variables are winsorized at the
top and bottom 1% to avoid the undue influence of outliers on the regression results.
In addition, in analyzing cross-sectional regression results by industry, an industry is
included only if there are at least 5 firms per 3-digit industry code. This results in 17
industries in the final sample of the Jones model estimation and a total of 14,008
firm-year observations for various equity valuation models.

Measurement of Accruals

better parameter estimates than the time-series version. This may be caused by the
misspecification of the time-series model owing to non-stationarity over a long
time period of the study. Moreover, the cross-sectional model gives a much larger
sample with available data on all necessary variables than the time-series version.
In addition, time-series model lowers the power of tests in examining the behavior of accruals when the estimation and treatment periods overlap.

The Jones model assumes that revenues are nondiscretionary. If managers manipulate earnings through discretionary revenues, then the model will remove part of the managed earnings from the discretionary accrual proxy and cause the estimate of earnings management to bias towards zero. Dechow, Sloan and Sweeney (1995) evaluate alternative accrual-based models for detecting earnings management and develop a modified version of the Jones model, in which change in accounts receivable ($\Delta AR_u$) is deducted from change in revenues ($\Delta REV_u$). It gives the highest power in detecting earnings management amongst the models evaluated\(^{39}\). The modified version eliminates the potential measurement error of the Jones model when management exercises discretion over revenues. However, Subramanyam (1996) finds the Jones model and the modified version do not give significantly different results, other than for the coefficient on revenue, which is defined differently between the two versions. Therefore, I initially estimate both the Jones and modified Jones models cross-sectionally for each year over the period of 1975-1995 and for each industry. The test models, as discussed earlier, are given in Eq. 1 and 4 respectively, and the variables are as defined earlier.

Jones model (Eq. 1):

\[
(T1) \quad AC_u / TA_{i,t-1} = a_0 (1 / TA_{i,t-1}) + a_1 (\Delta REV_u / TA_{i,t-1}) + a_2 (PPE_u / TA_{i,t-1}) + \nu_i
\]

\(^{39}\) The models evaluated include those developed by Healy, 1985; DeAngelo, 1986; Jones, 1991; Dechow, Sloan and Sweeney, 1995 (the modified Jones model); and Dechow and Sloan, 1991 (the Industry model).
Modified Jones model (Eq. 4):

$$\frac{AC_u}{TA_{u+1}} = a_0 \left( \frac{1}{TA_{u+1}} \right) + a_1 \left( \frac{\Delta REV_u - \Delta AR_u}{TA_{u+1}} \right) + a_2 \left( \frac{PPE_u}{TA_{u+1}} \right) + \gamma_u$$

Nondiscretionary accruals (NDC) and discretionary accruals (DC) for the Jones (Modified Jones) model are estimated as the fitted value from model T1 (model T2) and its residual respectively, as defined in Eq. 2-3 (Eq. 5-6). In so doing, I measure total accruals (AC) as:

$$AC = (\Delta current \ assets - \Delta cash) - (\Delta current \ liabilities - \Delta short \ term \ debt - \Delta taxes \ payable) - \text{depreciation}$$

The Jones (Modified Jones) model estimates nondiscretionary accruals as a positive function of changes in net revenues (less changes in net accounts receivable) and a negative function of the level of property, plant and equipment (PPE). Since earnings is recognized and recorded through the accrual accounting process, accruals naturally increase with increasing net revenues. As the level of PPE increases, depreciation generally increases and reduces reported earnings. Thus accruals reduce with increasing PPE. Therefore, the estimated revenue parameter $a_1$ should be positive while the estimated PPE parameter $a_2$ should be negative for both models. Table 1 shows that the Jones model performs better than the modified Jones model. Hence, I use only Jones model in all subsequent tests.
Empirical Specification and Operational Definition of Variables

The empirical testing in this study follows from the framework of Collins et al. (1999) and Subramanyam (1996). The simple earnings capitalization model in Eq. (7) is first used to test the valuation effect of earnings for all firms in the sample:

\[(T3) \quad P_i = \alpha + \beta E_i + \varepsilon_i\]

It is then used to test if there is a different valuation impact of positive against negative earnings. A dummy variable \(D\) is introduced to differentiate profit vs. loss firms, with \(D\) taking the value of 1 if earnings is positive, and zero otherwise. Thus the following test model is generated:

\[(T4) \quad P_i = \alpha + aD_i + \beta E_i + bD_i \times E_i + \eta_i\]

Models (T3) and (T4) are estimated using cross-sectional time-series pooled observations over the entire period of 1975-1995. All variables are measured on a per-share basis and adjusted for stock splits and stock dividends. \(P_i\) is the cum-dividend price, and is measured as the firm's stock price three months after the end of fiscal year \(t\), plus its dividends per share for year \(t\), adjusted for stock splits and dividends appropriate for the third month of fiscal year \(t+1\). Earnings \(E_i\) is the per share net income before extraordinary items in year \(t\). The subscript for individual firm is omitted throughout. The first hypothesis (H1) can be supported if the earnings coefficient for loss firms, \(\beta\) in (T4) is significantly negative while the same for profit firms \((\beta + b)\) is significantly positive.
Hypothesis H2 tests the misspecification of the simple earnings capitalization model and postulates that the book value of equity is a correlated omitted variable. To test the hypothesis, I add onto models (T3) and (T4) the book value of equity per share at the end of year t-1, $B_{t-1}$, and obtain (T5) and (T6) given below:

\[(T5) \quad P_t = \alpha + \beta E_t + \gamma B_{t-1} + \varepsilon_t\]

\[(T6) \quad P_t = \alpha + aD_t + \beta E_t + bD_t^* E_t + \gamma B_{t-1} + cD_t^* B_{t-1} + \eta_t\]

Models (T5) and (T6) are estimated cross-sectionally and time-series pooled over the period of 1975-1995. In addition, model (T6) is estimated cross-sectionally for each year in 1975-1995. Hypothesis H2 can be supported if the estimated earnings coefficient $\beta$ and the estimated book value coefficient $\gamma$ in model (T5) for the full sample are significantly positive. Similarly, H2 is supported if the estimated earnings coefficient $\beta (\beta + b)$ and the estimated book value coefficient $\gamma (\gamma + c)$ for loss (profit) firms in model (T6) are significantly positive.

Hypothesis H3 tests the negative (positive) bias of the earnings coefficient for a loss (profit) firm in the simple earnings capitalization model. H3 can be supported if the estimated earnings coefficient for loss firms, $\beta$, is significantly more positive in model (T6) than in model (T4) while the estimated earnings coefficient for profit firms, $(\beta + b)$, is significantly less positive in model (T6) than in model (T4).
Hypotheses H4 and H5 test the relative importance and value relevance of earnings and book value of equity for profit vs. loss firms. H4 can be supported if the estimated earnings coefficient for loss firms $\beta$ is significantly less positive than the estimated earnings coefficient for profit firms $(\beta + b)$ in model (T6). On the other hand, H5 can be supported if the estimated book value coefficient for loss firms $\gamma$ is significantly more positive than the estimated book value coefficient for profit firms $(\gamma + c)$ in model (T6).

Hypothesis H6 tests whether the market prices discretionary accruals. It can be operationalised by the following test model:

\[(T7) \quad P_t = a_0 + a_1 CF_t + a_2 NDC_t + a_3 DC_t + a_4 B_{t-1} + \varepsilon_t\]

where $CF_t$ is the operating cash flow per share of firm i in year t, and other variables are as defined earlier. H6 can be supported if the coefficient estimate of discretionary accruals $a_3$ is significantly positive.

To test hypothesis H7, which examines the impact of foreign shareholdings (FH) on the valuation effect of discretionary accruals, I rank the sample firms into low FH (below median) and high FH (above median) groups within each year. H7 can be supported if $a_3$ of model (T7) is significantly more positive for high FH firms than low FH firms.

Hypothesis H8 assesses the relationship of firm size with disclosure quality, as reflected by the extent of discretionary accruals being priced by the market. I stratify
the firms into two groups, the small and large-size groups, according to whether they have below or above median market value of equity (proxied by the log of total assets) within a year. H8 can then be supported if $a_3$ of model (T7) is significantly more positive for large-size firms than small-size firms.

Hypothesis H9 evaluates the impact of the firm’s level of gearing on the valuation of its discretionary accruals by the market. I rank firms into low-debt (below median) and high-debt (above median) groups in terms of their total debts to total assets ratios within each year. H9 is supported if $a_3$ of model (T7) is significantly more positive for low-debt firms than high-debt firms.

The last hypothesis, H10, examines how the market perceives the value relevance of discretionary accruals changes with the strength of the firm’s Keiretsu tie. Prior studies commonly adopt the approach of Nakatani (1984) to classify corporate group membership, i.e., firms are identified as group members if they exhibit strong group ties over the entire period of study. I adopt a similar approach here. Using classifications from the 1992/93 volume of Industrial Groupings in Japan (IGJ)$^{40}$, I classify my sample firms into three categories, according to their degree of inclination to their groups and their groups’ influential power. Group’s influential power (GIP) is measured by the ratio of group companies’ shareholding to the total shares (Kang and Shivdasani, 1995 and 1997). As a result, the sample is divided into: (1) independent firms, which have weak inclination to their groups and GIP less than

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$^{40}$ IGJ is published every two years by Dowell Marketing Consultants.
30%; (2) mixed-tie firms, which have inclined and connected links to the nucleus group companies\(^{41}\) and GIP of 30%-49%; and (3) strong Keiretsu-tie firms, which have strong inclination to their groups and GIP of 50% or above. \(H_10\) can then be supported if \(a\), of model (T7) is significantly more positive for strong-tie firms than independent firms.

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\(^{41}\) Nucleus companies are members of the group's various councils or clubs.
CHAPTER TWELTH: RESULTS AND ANALYSES

Results for the Jones and Modified Jones Models

Table 1 presents the regression results for the Jones and modified Jones models, estimated cross-sectionally for each year and for each industry. There are altogether 315 firms in the final sample. As expected, the mean coefficient on property, plant and equipment, $a_2$, is significantly negative for both the Jones and modified Jones models. They are -0.113 and -0.106 respectively, higher than the corresponding US evidence of -0.07 and -0.06 documented in Subramanyam (1996). However, contrary to theory and evidence provided by Subramanyam$^{42}$, the mean coefficient on change in net revenues, $a_1$, is insignificantly positive (0.012) for the Jones model, while it is significantly negative (-0.031) for the modified Jones model. Therefore, I base the rest of my analysis on the Jones model.

The Japanese economy experienced a bubble period in the 1980’s, followed by a recession starting from 1990 (Asian Business, May 1994, p.34). To control for potential problems arising from averaging results of non-stationary data, I stratify the sample into two sub-periods of 1975-1989 and 1990-1995, and present the mean regression results for the Jones model for each sub-period in Panel A of Table 2. Results for the two sub-samples follow more or less the same trend, therefore I report all subsequent test results using the entire sample period.

$^{42}$ He finds the mean $a_1$ coefficient significantly positive (0.06) for the Jones model but insignificantly positive for the modified Jones model (0.03).
Panel B of Table 2 further reports the results for the cross-sectional Jones model by industry. Results generally support the theory. Consistent with US evidence, the mean $a_1$ coefficients are significantly positive, except for a few industries, while mean $a_2$ coefficients are negative for all industries.

Descriptive Statistics

Table 3 presents the descriptive statistics for the variables used in testing the valuations of earnings, book value of equity and discretionary accruals. Panel A reports the univariate statistics for the 14,008 firm-year observations. The mean cum-dividend stock price (P) is ¥1,533. The mean book value of equity per share at the beginning of period (B$_1$) is ¥335. Thus price-to-book ratios are high, with mean and median values of 4.57 and 5.36. This is caused partly by the more conservative accounting practices adopted by Japanese firms (Cheung, Kim, and Lee, 2000; Bae and Kim, 1998), and by the bubble market as well. The sample has more profit than loss firms, hence the mean and median earnings per share (E) are positive, ¥21 and ¥15.6 respectively. Japanese stocks have extremely high price-earnings ratios (P/E), the mean and median P/E for the period 1975-1995 stand at 73 and 77, far higher than stocks in the US and other countries. This abnormality together with cross-holding of shares, excessive market regulation, and manipulation or speculation of big brokerage houses give the Japanese market a reputation of irrationality, inefficiency and non-competitiveness (Aoyama, 1994). Bae and Kim (1998) show that the mispricing of Japanese stocks provides opportunities for profitable trading strategies to be constructed.
An average firm has positive operating cash flow (CF) of twice its earnings. Mean and median nondiscretionary accruals (NDC) are negative, probably because of high depreciation. Discretionary accruals (DC) are low, with a mean and median value of ¥2 and ¥0.5 respectively. It also has higher (doubled) variability than nondiscretionary accruals and earnings. On average, foreign investors hold a small proportion of shares of Japanese firms, the mean FRN being 4.2%. However, foreign holdings can be as high as 75% in the extreme. The market value of equity (SIZE) of an average firm is ¥11, which is computed as the log of total assets. As documented in Caves and Uekusa (1976) and Nakatani (1984), Japanese firms are heavily involved in debt financing, this can be seen from their high mean debts to assets ratio (D_A) of 67%.

Panel B of Table 3 presents the Pearson and Spearman Correlation of the variables. As expected, price is highly positively correlated with book value and earnings. Price is also positively correlated with cash flows and discretionary accruals but negatively correlated with nondiscretionary accruals. Discretionary accruals are negatively correlated with nondiscretionary accruals (Spearman: -0.029). This evidence is consistent with Subramanyam (1996) and suggests income smoothing, but measurement error of discretionary accruals might be an alternative explanation. Pearson (Spearman) correlation between discretionary accruals and cash flow is -0.756 (-0.736), greater than the correlation between nondiscretionary accruals and cash flow (Pearson: -0.454; Spearman: -0.373). This suggests that discretionary accounting choices explain a larger proportion of the negative correlation between operating cash flow and accruals than nondiscretionary accruals. Price is positively correlated with foreign investors’ holdings and firm size. This is consistent with the
positive association of disclosure quality with firm size and foreign investors’ holding preference documented in Jiang and Kim (2000), Lang and Lundholm (1996), Bhusan (1989) and Dempsey (1989), and Atiase (1985 and 1987), among others. Finally, price is negatively correlated to the debt ratio, indicating that investors prefer companies with low debt financing.

**Results for Hypothesis H1**

Table 4 reports the pooled regression results of share price on earnings, book value and discretionary accruals for test models (T3) to (T7). Consistent with US evidence, column I shows that price is a positive function of earnings when a simple earnings capitalization model (T3) is used. The earnings coefficient is 34.678, much higher than the cross-sectional mean of 4.68 for US firms documented in Collins et al. (1999). This evidence is consistent with the more conservative accounting practices of Japanese firms (Bildersee et al., 1990) and/or the mispricing of shares by the market. Extant literature such as Bae and Kim (1998) find that the unrecorded goodwill, i.e., the difference between market and book values or the price-to-book ratio of Japanese firms is much higher than US firms. Cheung, Kim and Lee (2000) attribute this downward bias in book value to the highly conservative accounting practices adopted in Japan, and the large discrepancy between market and book values of real estate held by Japanese firms.

When prices of profit and loss firms are separately regressed on earnings (test model T4), results reveal a different pattern from the full sample. As expected, there is a differential valuation effect of positive vs. negative earnings (see column 2).
Earnings coefficient for loss firms is insignificantly negative ($E = -1.338$) while positive earnings has significantly positive impact on valuation, its earnings coefficient being $40.186$ ($E + D\cdot E = -1.338 + 41.524$). This supports hypothesis H1, though Japanese loss firms generally demonstrate much weaker negative price-earnings associations compared with their US counterparts. For example, Collins et al. obtain a significant mean cross-sectional earnings coefficient of $-1.12$ for loss firms over the period 1975-1992. This may again be explained by the pervasive use of conservative accounting practices by Japanese firms, which results in much higher (lower) reported losses (earnings). Consequently, the market discounts (magnifies) the reported losses (profits) accordingly.

**Results for Hypothesis H2**

Column 3 of Table 4 presents the pooled regression results for hypothesis H2 (test model T5), using the full sample. The coefficient on earnings ($22.626$) becomes less positive than when book value of equity is omitted ($34.678$, column 1). Adjusted R-square increases by $11\%$, indicating that book value has incremental explanatory power beyond earnings in explaining the variation of price. The coefficient on book value is significantly positive ($1.362$), suggesting that book value has value relevance for equity valuation. Therefore hypothesis H2 is supported.

When loss firms are segregated from profit firms (test model T6), consistent with Collins et al., significantly positive coefficients on earnings are obtained for both profit and loss firms (column 4). Similarly, significantly positive coefficients on book value of equity are obtained for both profit and loss firms, and adjusted R-
square increases by 7% (0.712-0.639). This again supports H2 and confirms that book value has value relevance and incremental explanatory power for equity valuation, irrespective of whether a company reports profits or losses.

**Results for Hypothesis H3**

Hypothesis H3 states that the omission of book value of equity from the simple earnings capitalization model causes a negative (positive) bias in the earnings coefficient for a loss (profit) firm. It is well supported, as evidenced by the comparative results in columns 2 and 4. Coefficient on earnings for loss firms (E) increases from insignificantly negative (-1.338, column 2) to significantly positive (3.616, column 4). On the other hand, the earnings coefficient for profit firms (E + D*E) reduces from 40.186 (-1.338+41.524, column 2) to 27.488 (3.616+23.872, column 4). The significance level also decreases.

**Results for Hypotheses H4 and H5**

Results in column 4 further support hypotheses H4 and H5, which test the respective role of book value and earnings in valuing profit vs. loss firms. Earnings coefficient for loss firms (3.616) is far less positive and significant than for profit firms (27.488). On the other hand, book value has a higher and more significant coefficient for loss firms (B₁ = 1.987) than for profit firms (B₁ + D* B₁ = 1.147). This is consistent with Hayn (1995), Burgstahler and Dichev (1997), and Collins et al. (1999), which conclude that earnings are more important and significantly priced for profit firms while losses are perceived as transitory by investors. Instead, book value of equity
becomes more value-relevant for loss firms since it proxies for the abandonment value.

Table 5 presents the cross-sectional regression results for share prices on earnings and book value of equity for each year in 1975-1995. Results further confirm and support hypotheses H2 to H5. Both earnings and book value for loss as well as profit firms are positively and significantly associated with prices (hypothesis H2). When compared to results with book value omitted (column 2 of Table 4), earnings coefficient for loss firms increases and becomes positive overall, and in 18 out of 21 years, while the same for profit firms decreases in magnitude and significance level (hypothesis H3). Positive earnings is strongly associated with stock prices while book value is significantly associated with prices when earnings is negative (hypotheses H4 and H5). The earnings coefficient for profit firms is consistently much higher than for loss firms over each of the 21 years. The mean for profit firms is 22.7 (2.507+20.193) while it is only 2.507 for loss firms. On the other hand, the coefficient on book value for loss firms (mean $B_{1} = 2.773$) is higher than for profit firms (mean = 2.773 - 1.028 = 1.745) overall, and in 18 years. Moreover, the mean coefficient for $B_{1}$ (2.773) is greater than the mean coefficient for $E$ (2.507), indicating that investors value book value more than earnings for loss firms, while the reverse is true for profit firms. Again, cross-sectional results indicate that Japanese firms have much stronger price-earnings and price-book associations than US firms. For instance, Collins et al. (1999) document mean earnings coefficients of 0.16 and 4.88 and mean book value coefficients of 0.47 and 0.45 for loss and profit firms respectively during 1975-1992.
To evaluate the significance of the coefficients, I follow the approach of Fama and MacBeth (1973) to aggregate coefficient values from the 21 annual regressions into a sampling distribution. The t-values are obtained by dividing the respective mean coefficient value by the standard deviation of the coefficient. All mean values are significant at the 10% level, based on a 2-tailed simple t-test.

**Results for Hypothesis H6**

Table 6 and column 5 of Table 4 respectively show the annual cross-sectional and pooled regression results of testing the valuation of discretionary accruals by model (T7). Both results show that discretionary accruals are significantly priced by the market, thus supporting hypothesis H6. Adjusted R-square of model (T7) is 0.642 (Table 4, column 5), and is comparable with 0.697 (Table 4, column 3) obtained for regressing price on earnings and book value in test model (T5). This indicates that accruals as well as cash flows are value relevant.

As reported in Table 5, the mean coefficient values and their respective t-values in Table 6 are obtained similarly by the Fama-MacBeth approach. The annual regression coefficients for 1975-1995 are aggregated to obtain the mean values, which all are significant at the 0.2% level (2 tailed). Discretionary accruals have a significantly positive coefficient overall, and in each year of 1975-1995, with a mean of 11.286 and a t-value of 12.077 (Table 6). Also, the coefficient on discretionary accruals is more positive and significant than the coefficient on nondiscretionary accruals.
overall, and in 16 out of 21 years. This is consistent with the arguments of Watts and Zimmerman (1986), Dechow (1994) and Subramanyam (1996), among others, that discretionary accounting choices improve the value relevance of earnings. The market prices discretionary accruals because investors perceive management using accruals to smooth income or signal credible private information of firm value. However, there is no evidence that discretionary accruals are superior over cash flows as a measure of firm performance, as documented in Bowen et al. (1987) and Dechow (1994). In fact coefficients on operating cash flows are slightly more positive than those on discretionary accruals, overall and in 12 out of 21 years.

It is interesting to note that discretionary accruals have more positive (above mean) coefficients in each year of the period 1990-1995, except for 1994. This may be explained by more extensive income smoothing and signaling of lower risk and/or other private management information on firm value during a period of economic recession. During the sample period of 1975 to 1989, the Japanese equity market experienced prodigious growth. In 1989, its market capitalisation exceeded the US market. Stocks were largely overpriced throughout the 1980’s, compared to their accounting fundamentals, and their US counterparts (Bildersee et al., 1990; Aoyama, 1994). For instance, while the average price-earnings ratio in 1989 was 14.8 in the US, it surged to a record high of 53.7 in Japan (French and Poterba, 1991). The Japanese government attempted to curb the speculative bubbling of asset markets by introducing a series of policy measures in 1990, such as the increase of interest rates (Darrough et al., 1998). Since then, the “asset market bubbles” burst and the Nikkei Index dipped sharply by 39% in 1990, leading Japan into a period of prolonged recession.
Bae and Kim (2000) provide evidence to suggest that the changes in economic conditions in 1990 have a significant impact on managerial incentives for income smoothing. Managers become more concerned about their job security and hence have increased incentives to smooth income through discretionary accrual choices. In particular, managers have much stronger incentives, in bad times than in good times, for income-decreasing discretionary accrual choices than for income-increasing accrual choices. Bae and Kim attribute this to the high marginal tax rate and the conformity of tax and financial reporting systems in Japan. Moreover, managers’ ability to choose income-decreasing discretionary accruals during the post-bubble period is significantly enhanced by cross-corporate, interlocking ownership. As cross-corporate ownership increases, managers become more entrenched and shielded from the monitoring and disciplinary forces of external stakeholders. Their results also reveal substantial weakening of the monitoring ability of financial institutions on clients’ managerial opportunism. The results shown in Table 6 are consistent with these notions. Investors perceive this income-decreasing incentive of managers and attach a higher multiple on the discretionary accruals.

Alternatively, one may argue that better performing firms during bad times have higher incentives to use discretionary accruals to signal their lower risks and/or higher earnings, so as to retain existing investors (creditors), and/or attract potential investors (creditors). Credible signals help reduce information asymmetry and contracting costs (Dechow 1994). When income is smoothed by discretionary accrual choices to mitigate the timing and mismatching problems of transitory cash flows, the
informativeness of earnings is enhanced (Chaney et al., 1996). Hence discretionary accruals are generally more positively priced during the post-bubble period.

Overall, discretionary accruals are more significantly priced in Japan than in the US. For example, Subramanyam (1996) obtains a significant coefficient on discretionary accruals of 1.0 for the regression of returns on earnings and earnings components. The adjusted R-square is low, not exceeding 6.5%. Sloan (1996) uses nonlinear generalized least squares to estimate stock price reaction to information in the accrual and cash flow components of current earnings about future earnings. He finds an estimate of 0.911 for the coefficient of current accruals vs. 0.826 for the coefficient on current cash flows. He concludes that stock prices do not appear to anticipate rationally the lower (higher) persistence of earnings attributable to the accrual (cash flow) component of earnings. He further finds a significantly negative relation between accruals and future stock returns.

The higher valuation relevance of discretionary accruals of Japanese firms is consistent with the unique corporate governance and employment-reward system of Japan. The joint ownership of debt and equity by financial institutions in Japan helps alleviate information asymmetry between managers and shareholders (Ho, Jiang and Kim, 2000). Significant cross-business holding and financial institutions holding, coupled with group dynamics of management, result in far closer ties between investors and management. There are more frequent interactions, information and risk sharing between investors and managers. Moreover, Japanese firms commonly offer lifetime tenure to employees. As such, Japanese employees enjoy high job
security, with pay often guaranteed based on seniority. In addition, Japanese managers are being evaluated primarily on their long-term performance, such as the maintenance and improvement of market shares over time. In contrast, US managers are being assessed more heavily on short-term performance, hence they are motivated to choose income-increasing discretionary accruals to boost current earnings (Jacobs, 1991; Jacobson and Aaker, 1993; Narayanan, 1985). Hence there is less incentive for managerial opportunism in Japan than in the US. Therefore discretionary accruals would be relatively more informative and credible and hence more significantly priced by the Japanese market.

Results for Hypotheses H7 to H10 (Sensitivity Analyses)

Table 7 reports the pooled regression results for four sensitivity checks on the pricing of discretionary accruals. They are foreign investors' holdings (FH), firm size proxied by the log of total assets, level of debt financing as measured by the total debts to total assets ratio, and Keiretsu classifications. The pricing of discretionary accruals is robust to all of these sensitivity checks. As expected, the coefficient on discretionary accruals is more significantly positive for: (1) high FH firms (15.942) than low FH firms (10.517); (2) large firms (15.101) than small firms (12.421); (3) low geared firms (17.816) than highly geared firms (8.485); and (4) strong Keiretsu-tie firms (18.631) than independent firms (10.804). Therefore, hypotheses H7 to H10 are well supported.
As regards shareholdings by foreign investors, the results are consistent with Jiang and Kim (2000), who find foreign investors being attracted to invest in Japanese companies with a lower degree of information asymmetry and higher disclosure quality. When Hall, Hamao and Harris (1994) compare the disclosure quality of accounting information between US and Japanese firms, they find Japanese stock prices largely unrelated to the intrinsic values (accounting fundamentals) of firms in the 1980's. Given the frequent criticisms of irrationality and inefficiency of the Japanese stock market, foreign investors naturally find it less risky to invest in firms with higher disclosure quality.

While foreign shareholders are mainly sophisticated institutional investors (Cheung, Kim and Lee; 1999), who have superior information processing skills and knowledge, they are disadvantaged by the exclusive information sharing among cross-owned Keiretsu group members (Shread, 1989; Cooke, 1997). To reduce their investment risks, foreign investors would target at firms which have less incentive to distort reported earnings, and which provide more public information and financial disclosures of high quality and credibility. When firms are not actively involved in opportunistic earnings management, their discretionary accruals provide more reliable and informative signals to the market and hence are more highly priced by an efficient market.

As regards firm size, more analysts tend to follow large firms (Atiase, 1980, 1985 and 1987; Bhushan, 1989; Dempsey, 1989; Lang and Lundholm, 1996), which have higher disclosure quality than small firms. Lang and Lundholm (1996) provide
evidence to support that analysts are primarily information intermediaries and firm-provided information is not a substitute for analyst services. Therefore, firms providing more informative disclosures attract more analysts following. Also, there are more accurate analyst earnings forecasts for these firms, and greater consensus among analyst forecasts and less volatility in forecast revisions. Other benefits from enhanced disclosures include increased investor following, reduced uncertainty and lower information asymmetry among stock market participants (Merton, 1987; Marcus and Wallace, 1991; and Mahoney, 1991).

Given that large firms have more analysts and investors following, there are more incentives for these firms to disseminate more information through various disclosure media, such as annual reports, other publications and investor relations effort. Moreover, the information disclosed has to be credible, otherwise, these firms would bear high costs of losing existing and potential investors and analysts following. In addition, large firms attract more regulatory bodies, politicians and public attention, and often are closely monitored by outside stakeholders. In Japan, this monitoring role is widely assumed by financial institutions, which taken as a whole, are the largest shareholders as well as debtholders of Japanese firms (Prowse 1990 and 1992). Thus large Japanese firms would be deterred from opportunistically managing earnings, they would bear high costs for distorting reported income through discretionary accruals. As a result, their discretionary accruals should be more value-relevant. The results obtained in this study support the argument that discretionary accruals are more significantly priced for big firms than small firms.
As discussed earlier, Japanese firms are characterized by high debt financing and financial institutions are the primary source of their debt finance (Nakatani, 1984). Faced with financial distress, managers of firms with high debt ratio might engage more in earnings management, despite their being monitored by debtholders and other outside stakeholders. Kang and Shivdasani (1995) provide evidence that Japanese top executives, similar to their US counterparts, are likely to be dismissed when current earnings performance is poor. This suggests that Japanese managers may also be motivated to choose income-increasing discretionary accruals when current performance is poor. This distorts the reported earnings and reduces its information content. It is therefore not surprising to find that the coefficient on discretionary accruals is significantly more positive for firms with low debt ratio than those highly geared firms. In this respect, investors seem to place more weight on the high debt effect than the monitoring effect of financial institutions on managerial opportunism. This is consistent with the notion that firms with high gearing have more incentive to get involved in opportunistic accrual choices.

Lastly, the effect of Keiretsu ties on the pricing of discretionary accruals is examined. For firms which have strong Keiretsu ties, large portions of shareholders are interrelated, cross-owned corporate group members. These shareholders have close relationships with management and enjoy timely information sharing among group members. Hence information asymmetry between managers and Keiretsu investors is lower (Jacobson and Aakar, 1993; Kang and Shivdasani, 1995; Ho et al., 2000). On the other hand, strong Keiretsu ties result in higher information asymmetry between managers and non-Keiretsu shareholders, who are excluded from the “information clubs” to share insider information. To the extent that firms are dominantly owned
by Keiretsu members, there should be a net effect of lower information asymmetry between managers and investors, as a whole. Hence, the disclosure quality of strongly cross-held firms should be higher, with their managers having lower incentive to manipulate discretionary choices. Results are consistent with this argument. Discretionary accruals for companies with strong Keiretsu ties have a significantly more positive coefficient, compared with independent firms and firms with mixed ties.

In summary, ceteris paribus, firms with high foreign shareholdings, large market capitalisation, low gearing, and strong Keiretsu ties generally have better disclosure quality, lower information asymmetry and less incentive for opportunistic earnings management. Thus information released by these firms represents more credible signals to the market of firm performance and valuation. Therefore discretionary accruals of these firms are generally more value-relevant and highly priced by the market.

Finally, one common finding is that when estimating test models (T3) to (T7), both pooled and cross-sectional regressions give significant and positive intercepts, as reported in Tables 4 to 7. This result is consistent with the other non-accounting information, which is omitted from the empirical models here, being value-relevant and has a positive impact on firm valuation (Ohlson, 1995; Feltham and Ohlson, 1995).
CHAPTER THIRTEEN: CONCLUSION

This essay tests the nonhomogeneous valuation effect of positive and negative earnings, the misspecification of the simple earnings capitalization model and the pricing of discretionary accruals. Consistent with US evidence such as Hayn (1995), Jan and Ou (1995) and Collins et al. (1999), when a simple earnings capitalization model is used, Japanese stock prices are negatively, though insignificantly, associated with losses but significantly and positively associated with profits. However, compared with US evidence, the negative price-earnings association is weaker for Japanese loss firms while the positive price-earnings association is much stronger for profit firms. This is consistent with extant literature documenting the pervasive use of more conservative accounting practices by Japanese firms than by US firms, and the stock bubble of the Japanese market.

When book value of equity is added as an additional explanatory variable, the negative price-earnings association is reversed. Results show that book value is value-relevant and has incremental explanatory power beyond earnings to provide information on stock price. Moreover, its omission causes a positive bias of the coefficient on positive earnings. Results also reveal that investors value earnings more than book value for profit firms and vice versa for loss firms. This is consistent with Berger et al. (1996), Barth et al. (1996), and Burgstahler and Dichev (1997), which conclude that book value proxies for the abandonment value of loss firms.
This essay contributes beyond Collins et al. (1999) to consider the pricing of discretionary accruals in addition to earnings and book value. Evidence supports arguments in extant literature that discretionary accruals enhance the informativeness of reported earnings and hence are priced by an efficient market. They signal management’s private information on firm value and help smooth income in a way desirable by investors. Results are robust to various sensitivity checks to assess the impact of foreign investors’ holdings, firm size, the level of debt financing and the strength of Keiretsu ties on the valuation of discretionary accruals.

Overall, discretionary accruals are more significantly priced in Japan than in the US, which is consistent with the unique corporate governance and employment-reward system of Japan. The joint ownership of debt and equity by financial institutions, interlocking ownership, significant inter-group (Keiretsu) holdings, together with group management dynamics result in far closer ties and less information asymmetry between Japanese investors and management (Ho et al., 2000; Jacobson and Aaker, 1993; Kagono et al., 1983). There are more frequent interactions, information and risk sharing between investors and managers. Moreover, Japanese employees enjoy higher job security and Japanese managers are evaluated more on their long-term performance than short-term performance, in contrast with their US counterparts. As such, US managers are more motivated to choose income-increasing discretionary accruals to boost current earnings (Jacobs, 1991; Jacobson and Aaker, 1993; Narayanan, 1985), while Japanese managers are less motivated for managerial opportunism. Therefore discretionary accruals are relatively more informative and credible and hence more significantly priced by the Japanese market.
This essay corroborates the findings of Subramanyam (1996) and Collins et al. (1999) in a different setting. It contributes to the growing body of evidence which suggests that accounting fundamentals such as current earnings and book value are value-relevant and contribute to explaining stock price variation. In addition, evidence suggests that discretionary accounting choices improve firms' disclosure quality, reduce information asymmetry, and enhance the informativeness of reported earnings. The findings could provide insights for researchers, investors, analysts and accounting standard setting bodies to better understand how the Japanese market prices stocks, how accrual accounting could improve the informativeness of reported earnings, and how uniformity vs. flexibility could be allowed in accounting standards to achieve the full benefits of each choice.
TABLES FOR THE SECOND ESSAY

Table 1. Regression results for the Jones model and the Modified Jones model, estimated cross-sectionally for each year and for each industry.

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Jones</th>
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<th></th>
<th>Modified Jones</th>
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<tr>
<td></td>
<td>a₀</td>
<td>a₁</td>
<td>a₂</td>
<td>a₀</td>
<td>a₁</td>
<td>a₂</td>
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<tr>
<td>(Predicted sign)</td>
<td>(?)</td>
<td>(+)</td>
<td>(-)</td>
<td>(?)</td>
<td>(+)</td>
<td>(-)</td>
</tr>
<tr>
<td>mean</td>
<td>-14.886</td>
<td>0.012</td>
<td>-0.113</td>
<td>-5.033</td>
<td>-0.031</td>
<td>-0.106</td>
</tr>
<tr>
<td>std. dev.</td>
<td>412.316</td>
<td>0.169</td>
<td>0.077</td>
<td>431.971</td>
<td>0.192</td>
<td>0.074</td>
</tr>
<tr>
<td>median</td>
<td>-17.205</td>
<td>0.012</td>
<td>-0.11</td>
<td>-20.197</td>
<td>-0.018</td>
<td>-0.102</td>
</tr>
<tr>
<td>min</td>
<td>-2121.86</td>
<td>-1.103</td>
<td>-0.385</td>
<td>-2091.83</td>
<td>-1.117</td>
<td>-0.369</td>
</tr>
<tr>
<td>max</td>
<td>1622.557</td>
<td>0.866</td>
<td>0.221</td>
<td>2126.766</td>
<td>1.373</td>
<td>0.168</td>
</tr>
<tr>
<td>t</td>
<td>-0.641</td>
<td>1.214</td>
<td>-26.161</td>
<td>-0.207</td>
<td>-2.826</td>
<td>-25.442</td>
</tr>
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<td>% positive</td>
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<td>0.546</td>
<td>0.057</td>
<td>0.47</td>
<td>0.413</td>
<td>0.07</td>
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</tbody>
</table>

Jones model:

(1) \( \frac{AC_{it}}{TA_{i,t-1}} = a_0 \left( \frac{1}{TA_{i,t-1}} \right) + a_1 \left( \frac{\Delta REV_{it}}{TA_{i,t-1}} \right) + a_2 \left( \frac{PPE_{it}}{TA_{i,t-1}} \right) + \nu_i \)

(2) \( NDC_{it} = a_0 \left( \frac{1}{TA_{i,t-1}} \right) + a_1 \left( \frac{\Delta REV_{it}}{TA_{i,t-1}} \right) + a_2 \left( \frac{PPE_{it}}{TA_{i,t-1}} \right) \)

(3) \( DC_{it} = \frac{AC_{it}}{TA_{i,t-1}} - NDC_{it} \)

Modified Jones model:

(4) \( \frac{AC_{it}}{TA_{i,t-1}} = a_0 \left( \frac{1}{TA_{i,t-1}} \right) + a_1 \left( \frac{\Delta REV_{it} - \Delta AR_{it}}{TA_{i,t-1}} \right) + a_2 \left( \frac{PPE_{it}}{TA_{i,t-1}} \right) + \gamma_i \)

(5) \( NDC_{it} = a_0 \left( \frac{1}{TA_{i,t-1}} \right) + a_1 \left( \frac{\Delta REV_{it} - \Delta AR_{it}}{TA_{i,t-1}} \right) + a_2 \left( \frac{PPE_{it}}{TA_{i,t-1}} \right) \)

(6) \( DC_{it} = \frac{AC_{it}}{TA_{i,t-1}} - NDC_{it} \)

where

\( NDC_{it} \) = non-discretionary accruals of firm i in year t
\( DC_{it} \) = discretionary accruals of firm i in year t
\( AC_{it} \) = total accruals of firm i in year t
\( \Delta REV_{it} \) = revenues in year t less revenues in year t-1 of firm i
\( \Delta AR_{it} \) = net accounts receivable in year t less net accounts receivable in year t-1 of firm i
\( PPE_{it} \) = gross property, plant and equipment in year t of firm i
\( TA_{i,t-1} \) = total assets of firm i in year t-1
\( a_0, a_1, a_2 \) = firm-specific parameters
Table 2. Regression results for the Jones model estimated cross-sectionally for each year and for each industry

Panel A. For the sub-samples before 1990, and in and after 1990.

<table>
<thead>
<tr>
<th></th>
<th>Before 1990</th>
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<th>In and after 1990</th>
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<td>$a_2$</td>
<td>$a_0$</td>
</tr>
<tr>
<td>(Predicted sign)</td>
<td>(? )</td>
<td>(+)</td>
<td>(-)</td>
<td>(? )</td>
</tr>
<tr>
<td>mean</td>
<td>-22.66</td>
<td>0.008</td>
<td>-0.118</td>
<td>4.866</td>
</tr>
<tr>
<td>std. dev.</td>
<td>357.328</td>
<td>0.132</td>
<td>0.077</td>
<td>528.767</td>
</tr>
<tr>
<td>median</td>
<td>-15.058</td>
<td>0.015</td>
<td>-0.115</td>
<td>-24.551</td>
</tr>
<tr>
<td>min</td>
<td>-2121.86</td>
<td>-0.45</td>
<td>-0.385</td>
<td>-1511.52</td>
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<tr>
<td>max</td>
<td>1622.557</td>
<td>0.745</td>
<td>0.221</td>
<td>1361.137</td>
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<tr>
<td>t</td>
<td>-0.954</td>
<td>0.882</td>
<td>-23.088</td>
<td>0.087</td>
</tr>
<tr>
<td>% positive</td>
<td>0.469</td>
<td>0.566</td>
<td>0.053</td>
<td>0.472</td>
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<td>N</td>
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</table>

Panel B. By industry

<table>
<thead>
<tr>
<th>industry</th>
<th>$a_0$ mean</th>
<th>$a_0$ median</th>
<th>$a_1$ mean</th>
<th>$a_1$ median</th>
<th>$a_2$ mean</th>
<th>$a_2$ median</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>-8.383</td>
<td>-113.262</td>
<td>0.021</td>
<td>0.008</td>
<td>-0.101</td>
<td>-0.084</td>
<td>20</td>
</tr>
<tr>
<td>Foods</td>
<td>88.065</td>
<td>97.838</td>
<td>-0.035</td>
<td>-0.033</td>
<td>-0.128</td>
<td>-0.131</td>
<td>21</td>
</tr>
<tr>
<td>Textiles</td>
<td>-16.101</td>
<td>-12.142</td>
<td>0.062</td>
<td>0.028</td>
<td>-0.104</td>
<td>-0.106</td>
<td>19</td>
</tr>
<tr>
<td>Chemicals</td>
<td>24.714</td>
<td>19.053</td>
<td>0.016</td>
<td>0.051</td>
<td>-0.11</td>
<td>-0.116</td>
<td>21</td>
</tr>
<tr>
<td>Glass/Ceramics</td>
<td>12.844</td>
<td>-14.996</td>
<td>0.005</td>
<td>0.011</td>
<td>-0.111</td>
<td>-0.11</td>
<td>19</td>
</tr>
<tr>
<td>Iron &amp; Steel</td>
<td>-115.864</td>
<td>-188.022</td>
<td>-0.028</td>
<td>-0.025</td>
<td>-0.095</td>
<td>-0.092</td>
<td>20</td>
</tr>
<tr>
<td>Non-ferrous Metals</td>
<td>-33.867</td>
<td>14.003</td>
<td>-0.035</td>
<td>-0.043</td>
<td>-0.129</td>
<td>-0.159</td>
<td>20</td>
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<tr>
<td>Metal Products</td>
<td>240.723</td>
<td>477.729</td>
<td>0.082</td>
<td>0.131</td>
<td>-0.108</td>
<td>-0.128</td>
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</tr>
<tr>
<td>Machinery</td>
<td>-33.054</td>
<td>-33.781</td>
<td>0.063</td>
<td>0.053</td>
<td>-0.097</td>
<td>-0.1</td>
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</tr>
<tr>
<td>Electric machinery</td>
<td>-9.026</td>
<td>24.93</td>
<td>0.057</td>
<td>0.053</td>
<td>-0.16</td>
<td>-0.159</td>
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</tr>
<tr>
<td>Transport equipment</td>
<td>-80.782</td>
<td>-38.891</td>
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<td>-0.024</td>
<td>-0.175</td>
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<tr>
<td>Other manufacturing</td>
<td>332.518</td>
<td>459.19</td>
<td>0.212</td>
<td>0.286</td>
<td>-0.135</td>
<td>-0.11</td>
<td>5</td>
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<tr>
<td>wholesale</td>
<td>234.597</td>
<td>146.603</td>
<td>0.022</td>
<td>0.016</td>
<td>-0.124</td>
<td>-0.133</td>
<td>20</td>
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<tr>
<td>retail</td>
<td>33.56</td>
<td>54.972</td>
<td>0.011</td>
<td>-0.001</td>
<td>-0.104</td>
<td>-0.103</td>
<td>20</td>
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<tr>
<td>Land transport</td>
<td>-569.546</td>
<td>-559.076</td>
<td>-0.084</td>
<td>-0.119</td>
<td>-0.071</td>
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<tr>
<td>shipping</td>
<td>21.821</td>
<td>-91.689</td>
<td>0.064</td>
<td>0.001</td>
<td>-0.112</td>
<td>-0.109</td>
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</tr>
<tr>
<td>services</td>
<td>22.542</td>
<td>13.194</td>
<td>-0.047</td>
<td>-0.073</td>
<td>-0.062</td>
<td>-0.063</td>
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Table 3 - Panel A. Univariate Statistics

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<th>Variable</th>
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<th>Median</th>
<th>Minimum</th>
<th>Maximum</th>
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<tr>
<td>P</td>
<td>1533.439</td>
<td>1399.194</td>
<td>1205.000</td>
<td>100.000</td>
<td>9940.000</td>
</tr>
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<td>B_{-1}</td>
<td>335.496</td>
<td>434.654</td>
<td>225.000</td>
<td>0.300</td>
<td>9720.152</td>
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<tr>
<td>E</td>
<td>20.958</td>
<td>30.961</td>
<td>15.626</td>
<td>-58.125</td>
<td>182.609</td>
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<tr>
<td>CF</td>
<td>44.158</td>
<td>79.932</td>
<td>34.221</td>
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<tr>
<td>DC</td>
<td>2.121</td>
<td>66.198</td>
<td>0.545</td>
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<tr>
<td>FRN</td>
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<td>0.070</td>
<td>0.016</td>
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<tr>
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</table>

Table 3 - Panel B. Pearson and Spearman Correlation

Pearson correlation coefficients are in the upper triangle. Spearman correlation coefficients are in the lower triangle. P-values are in parentheses.

<table>
<thead>
<tr>
<th></th>
<th>P</th>
<th>B_{-1}</th>
<th>E</th>
<th>CF</th>
<th>NDC</th>
<th>DC</th>
<th>FRN</th>
<th>SIZE</th>
<th>D_A</th>
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<td>P</td>
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<td>0.767</td>
<td>0.332</td>
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<td>0.095</td>
<td>0.223</td>
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<tr>
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<td>(0.000)</td>
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<tr>
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<td>(0.000)</td>
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</tr>
<tr>
<td>SIZE</td>
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<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td></td>
</tr>
<tr>
<td>D_A</td>
<td>-0.557</td>
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<td>-0.090</td>
<td>-0.001</td>
<td>-0.089</td>
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<tr>
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<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td></td>
</tr>
</tbody>
</table>

Variable definition:
P = cum-dividend share price
B_{-1} = book value of equity per share at the beginning of the period
E = earnings per share
CF = operating cash flow per share
NDC = non-discretionary accruals per share
DC = discretionary accruals per share
FRN = percentage of shares owned by foreign investors
SIZE = size (market value of equity) of firm, measured as the log of total assets
D_A = total debts to total assets ratio
Table 4. Regression results of share prices on independent variables for the full sample

Test models

\begin{align*}
(T3) & \quad P_t = \alpha + \beta E_t + \epsilon_t \\
(T4) & \quad P_t = \alpha + aD_t + \beta E_t + bD_t^* E_t + \eta_t \\
(T5) & \quad P_t = \alpha + \beta E_t + \gamma B_{t-1} + \epsilon_t \\
(T6) & \quad P_t = \alpha + aD_t + \beta E_t + bD_t^* E_t + \gamma B_{t-1} + cD_t^* B_{t-1} + \eta_t \\
(T7) & \quad P_t = a_0 + a_1 CF_t + a_2 NDC_t + a_3 DC_t + a_4 B_{t-1} + \epsilon_t
\end{align*}

<table>
<thead>
<tr>
<th>Test model</th>
<th>Predicted Sign</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
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</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>(+)</td>
<td>806.648</td>
<td>596.272</td>
<td>602.273</td>
<td>306.684</td>
<td>642.241</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(55.094)</td>
<td>(23.687)</td>
<td>(28.609)</td>
<td>(8.915)</td>
<td>(21.701)</td>
</tr>
<tr>
<td>D</td>
<td>(+)</td>
<td>0.700</td>
<td>219.264</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.024)</td>
<td>(5.817)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>(T4) : (-)</td>
<td>34.678</td>
<td>-1.338</td>
<td>22.626</td>
<td>3.616</td>
<td></td>
</tr>
<tr>
<td>Others: (+)</td>
<td></td>
<td>(55.443)</td>
<td>(-0.978)</td>
<td>(24.656)</td>
<td>(3.442)</td>
<td></td>
</tr>
<tr>
<td>D*E</td>
<td>(+)</td>
<td>41.524</td>
<td>23.872</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(26.818)</td>
<td>(14.992)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CF</td>
<td>(+)</td>
<td>13.869</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(15.895)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NDC</td>
<td>(+)</td>
<td>12.733</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(12.911)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC</td>
<td>(+)</td>
<td>13.781</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(15.547)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B_{t-1}</td>
<td>(+)</td>
<td>1.362</td>
<td>1.987</td>
<td>1.686</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(12.835)</td>
<td>(10.157)</td>
<td>(13.596)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D*B_{t-1}</td>
<td>(-)</td>
<td>-0.840</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>(-3.857)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R-sq</td>
<td></td>
<td>0.589</td>
<td>0.639</td>
<td>0.697</td>
<td>0.712</td>
<td>0.642</td>
</tr>
</tbody>
</table>

Variable definition:
P = cum-dividend share price
D=1 if E>0, and 0 otherwise
E = per share earnings before extraordinary items
CF = operating cash flow per share
NDC = non-discretionary accruals per share
DC = discretionary accruals per share
B_{t-1} = book value of equity per share at the beginning of the period
Table 5. Year-by-year and Fama-MacBeth regression results of share prices on earnings and book value for profit vs. loss firms

\[ P_t = \alpha + a.D_t + \beta.E_t + b.D_t \cdot E_t + \gamma.B_{t-1} + c.D_t \cdot B_{t-1} + \eta_t \]

<table>
<thead>
<tr>
<th>YEAR</th>
<th>INTERCEPT</th>
<th>D</th>
<th>E</th>
<th>D*E</th>
<th>B_{t-1}</th>
<th>D*B_{t-1}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted Sign</td>
<td>(+)</td>
<td>(+)</td>
<td>(+)</td>
<td>(+)</td>
<td>(+)</td>
<td>(-)</td>
</tr>
<tr>
<td>1976</td>
<td>54.200</td>
<td>153.433</td>
<td>5.687</td>
<td>11.408</td>
<td>3.721</td>
<td>-0.865</td>
</tr>
<tr>
<td>1977</td>
<td>82.200</td>
<td>121.226</td>
<td>3.478</td>
<td>9.355</td>
<td>2.779</td>
<td>0.497</td>
</tr>
<tr>
<td>1978</td>
<td>194.810</td>
<td>38.891</td>
<td>4.067</td>
<td>9.222</td>
<td>2.233</td>
<td>0.889</td>
</tr>
<tr>
<td>1979</td>
<td>87.930</td>
<td>143.721</td>
<td>4.658</td>
<td>3.477</td>
<td>3.662</td>
<td>-0.545</td>
</tr>
<tr>
<td>1980</td>
<td>121.040</td>
<td>84.532</td>
<td>8.921</td>
<td>6.913</td>
<td>3.995</td>
<td>-1.534</td>
</tr>
<tr>
<td>1981</td>
<td>158.750</td>
<td>128.844</td>
<td>8.961</td>
<td>1.510</td>
<td>3.934</td>
<td>-1.465</td>
</tr>
<tr>
<td>1982</td>
<td>124.100</td>
<td>161.418</td>
<td>1.507</td>
<td>17.448</td>
<td>2.413</td>
<td>-0.501</td>
</tr>
<tr>
<td>1983</td>
<td>250.000</td>
<td>77.525</td>
<td>5.537</td>
<td>33.378</td>
<td>2.138</td>
<td>-1.058</td>
</tr>
<tr>
<td>1984</td>
<td>91.100</td>
<td>238.126</td>
<td>-3.236</td>
<td>34.539</td>
<td>2.778</td>
<td>-1.313</td>
</tr>
<tr>
<td>1985</td>
<td>279.200</td>
<td>237.628</td>
<td>-1.703</td>
<td>26.366</td>
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<td>-0.564</td>
</tr>
<tr>
<td>1986</td>
<td>480.380</td>
<td>190.303</td>
<td>1.681</td>
<td>22.873</td>
<td>0.906</td>
<td>0.722</td>
</tr>
<tr>
<td>1987</td>
<td>507.200</td>
<td>317.283</td>
<td>0.188</td>
<td>29.789</td>
<td>2.170</td>
<td>-0.797</td>
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<tr>
<td>1990</td>
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<td>214.355</td>
<td>2.125</td>
<td>28.858</td>
<td>2.632</td>
<td>-1.782</td>
</tr>
<tr>
<td>1991</td>
<td>530.230</td>
<td>111.775</td>
<td>6.143</td>
<td>19.584</td>
<td>1.656</td>
<td>-0.840</td>
</tr>
<tr>
<td>1992</td>
<td>169.360</td>
<td>287.841</td>
<td>1.123</td>
<td>20.280</td>
<td>1.726</td>
<td>-0.281</td>
</tr>
<tr>
<td>1994</td>
<td>340.750</td>
<td>-76.741</td>
<td>2.687</td>
<td>21.580</td>
<td>0.969</td>
<td>-0.282</td>
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<tr>
<td>1995</td>
<td>637.640</td>
<td>25.096</td>
<td>9.626</td>
<td>19.907</td>
<td>1.239</td>
<td>-0.384</td>
</tr>
</tbody>
</table>


\( t = (6.695)*** (4.768)*** (1.921)*(8.321)*** (9.365)*** (-3.474)**

* significant at 10% level (2 tailed)
** significant at 1% level (2 tailed)
*** significant at 0.2% level (2 tailed)

Variable definition:

P = cum-dividend share price
D=1 if E>0, and 0 otherwise
E = per share earnings before extraordinary items
B_{t-1} = book value of equity per share at the beginning of the period
Table 6. Year-by-year and Fama-MacBeth regression results of share prices on independent variables

\[ P = a_0 + a_1 \text{CF} + a_2 \text{NDC} + a_3 \text{DC} + a_4 \text{B}_{.1} + \varepsilon \]

<table>
<thead>
<tr>
<th>YEAR</th>
<th>INTERCEPT</th>
<th>CF</th>
<th>NDC</th>
<th>DC</th>
<th>B_{.1}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sign</td>
<td>(+)</td>
<td>(+)</td>
<td>(+)</td>
<td>(+)</td>
<td>(+)</td>
</tr>
<tr>
<td>1976</td>
<td>247.120</td>
<td>13.084</td>
<td>13.209</td>
<td>13.010</td>
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<tr>
<td>1978</td>
<td>249.480</td>
<td>7.624</td>
<td>7.726</td>
<td>7.169</td>
<td>3.653</td>
</tr>
<tr>
<td>1979</td>
<td>222.490</td>
<td>3.610</td>
<td>0.498</td>
<td>3.854</td>
<td>3.361</td>
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<tr>
<td>1980</td>
<td>347.310</td>
<td>9.906</td>
<td>10.920</td>
<td>8.754</td>
<td>2.554</td>
</tr>
<tr>
<td>1981</td>
<td>315.800</td>
<td>3.772</td>
<td>2.823</td>
<td>3.446</td>
<td>2.918</td>
</tr>
<tr>
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<td>12.728</td>
<td>11.520</td>
<td>11.600</td>
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<tr>
<td>1983</td>
<td>601.520</td>
<td>15.628</td>
<td>18.295</td>
<td>15.696</td>
<td>2.207</td>
</tr>
<tr>
<td>1984</td>
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<td>18.066</td>
<td>18.922</td>
<td>19.403</td>
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<td>517.600</td>
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<td>9.588</td>
<td>13.877</td>
<td>2.500</td>
</tr>
<tr>
<td>1986</td>
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<td>9.531</td>
<td>7.450</td>
<td>7.554</td>
<td>2.236</td>
</tr>
<tr>
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<td>12.310</td>
<td>11.220</td>
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<tr>
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<td>10.223</td>
<td>7.303</td>
<td>8.858</td>
<td>2.185</td>
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<tr>
<td>1989</td>
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<td>15.043</td>
<td>11.363</td>
<td>14.388</td>
<td>1.709</td>
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<td>928.830</td>
<td>16.413</td>
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<td>16.969</td>
<td>1.449</td>
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<td>292.360</td>
<td>8.474</td>
<td>3.635</td>
<td>8.189</td>
<td>1.016</td>
</tr>
</tbody>
</table>

average: 552.448

\[ t = (8.142)*** (13.616)*** (9.702)*** (12.077)*** (13.572)*** \]

*** significant at 0.2% level (2 tailed)

**Variable definition:**

- \( P \) = cum-dividend share price
- \( \text{CF} \) = operating cash flow per share
- \( \text{NDC} \) = non-discretionary accruals per share
- \( \text{DC} \) = discretionary accruals per share
- \( \text{B}_{.1} \) = book value of equity per share at the beginning of the period
Table 7. Regression results of share prices on independent variables by subsample

\[(T7) \quad P = a_0 + a_1 CF + a_2 NDC + a_3 DC + a_4 B_1 + \varepsilon\]

<table>
<thead>
<tr>
<th>Predicted</th>
<th>Foreign holdings</th>
<th>Market value of equity</th>
<th>Debt/Asset ratio</th>
<th>Keiretsu classifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sign</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Intercept</td>
<td>(+)</td>
<td>472.148</td>
<td>791.022</td>
<td>539.811</td>
</tr>
<tr>
<td>B_1</td>
<td>(+)</td>
<td>2.052</td>
<td>1.446</td>
<td>1.753</td>
</tr>
<tr>
<td>N</td>
<td>6998</td>
<td>7010</td>
<td>6736</td>
<td>7272</td>
</tr>
<tr>
<td>Adj R-sq</td>
<td>0.583</td>
<td>0.662</td>
<td>0.644</td>
<td>0.643</td>
</tr>
</tbody>
</table>

Variable and sub-sample definition:

\[P = \text{cum-dividend share price}\]
\[CF = \text{operating cash flow per share}\]
\[NDC = \text{non-discretionary accruals per share}\]
\[DC = \text{discretionary accruals per share}\]
\[B_1 = \text{book value of equity per share at the beginning of the period}\]

High (low) foreign ownership sub-sample contains firms with foreign investors' holdings above (below) the median for the year.

High (low) size sub-sample contains firms with market value of equity above (below) the median for the year.

High (low) debt sub-sample contains firms with total debts to total assets ratios above (below) the median for the year.

Independent firms have group's influential power (GIP), measured by the ratio of group companies' shareholding to the total shares, of less than 30%; mixed-tie firms have GIP of 30%-49%; and strong Keiretsu-tie firms have GIP of 50% or above.
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