

CHANGES IN THE VALUE-RELEVANCE OF ACCOUNTING BOOK VALUES AND EARNINGS: EMPIRICAL EVIDENCE FROM JAPAN*

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Abstract

This study provides an empirical investigation into the value relevance of accounting book values and earnings — two fundamental summary measures — in the context of Japan. Using a sample of 17,900 parent-only firm-year observations and 11,980 consolidated firm-year observations, this study documents that accounting information is value relevant based on both a price and a first-difference version of the price models. Both the pooled and the time-series regressions and the year-by-year regression support the value relevance hypothesis. The impact of the changing nature of corporate governance system as proxied by ownership and leverage structure on the value relevance of accounting information is also examined in Japan. Five major conclusions emerge from the empirical analysis; (i) the explanatory power of parent-only incremental earnings has shown an upward trend with time; (ii) the combined explanatory power of consolidated earnings and book values has increased over time; (iii) the explanatory power of consolidated incremental earnings, like parent-only earnings has also increased over time; (iv) the combined explanatory power of consolidated earnings and book values after controlling for unconsolidated earnings and book values has been found to possess incremental information content, and (v) the proportion of individual shareholding (leverage) has a positive (negative) impact on the changing value relevance of accounting information.

I. Introduction

This study empirically assesses the changing value relevance of two fundamental accounting numbers namely, parent and consolidated earnings and book values of equity in the context of Japan and whether the changing ownership and leverage structure has any impact on such changes. This research is motivated by numerous studies on the value relevance of accounting numbers in the U.S. in which the empirical relation between stock market values or changes in values and various accounting numbers is examined. Beginning with the seminal work of Ball and Brown (1968) and Beaver (1968), accounting researchers for the last thirty years or so

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have been studying the relationship between accounting numbers and firm value.¹ However, these studies focused on an income statement measure of firm performance, i.e., accounting earnings. More recently, studies concerning value relevance of accounting numbers² have been expanded to include both balance sheet measures of assets and liabilities and income statement measures of earnings made possible by a model developed by Ohlson (1995).

Using both book values of equity (a balance sheet measure)³ and earnings (an income statement measure) and employing Ohlson's valuation model, a number of empirical research studies have investigated the issue of changes in value relevance of accounting information [Collins, Maydew and Weiss (hereafter, CMW) 1997, Francis and Schipper 1999, Lev and Zarowin 1999]. This study extends this line of inquiry into the Japanese market. Although a number of studies [Hall, Hamao and Harris 1994, Alford, Jones, Leftwich, and Zmijewski 1993, Ali and Hwang 1999, Usui (1999), Yamaji (2000)] investigated value relevance of earnings alone or earnings and book values in the context of Japan, none attempted to identify whether a change has occurred over time in the value relevance of accounting information and whether the changing corporate governance system of Japan has any impact on such changes. This study fills this void by documenting the trend in value relevance of accounting information over 1976 to 1999 for parent alone and over 1984 to 1999 for consolidated accounting numbers, and by empirically examining the role of ownership and leverage structure on such value relevance. In contrast to the major capital markets in the world where consolidated financial statements represent the primary means through which information about a particular company is presented, the Japanese financial markets have historically perceived parent-only financial statements as the primary financial statements. Although, the Business Accounting Deliberation Council (hereafter BADC) recommended the filing of audited consolidated financial statements for the fiscal year ending on or after March 31, 1978, it was not until 1984 that majority companies started to present consolidated financial statements as equity method of accounting was made mandatory. Hence an important question that is worth pursuing is whether the consolidated accounting information is incrementally value relevant after controlling for parent-only accounting information.

The objective of this study is threefold; (i) to assess changes in value relevance of two fundamental accounting numbers namely, parent and consolidated earnings and book values of equity over a relatively longer period of time; (ii) to determine whether consolidated financial numbers have any incremental value relevance over that of parent-only numbers, and finally (iii) to analyze the impact of changing corporate governance systems in Japan as proxied by ownership and leverage structure on the changing value relevance. Using a sample of 17,900 parent-alone observations over 1976-1999 and 11,980 consolidated firm-year observations over 1984-1999, this study finds that (i) the explanatory power of parent-only

¹ For an extensive review of capital markets research in accounting refer to Kothari (1999).

² Value relevance approach typically examines the association between market values and accounting summary measures, such as earnings and book values. Lo and Lys (2000) formalizes this approach as;

$$P_{it} = g(I_{it}) + \eta_{it}$$

A specific information item I_{it} is value relevant if it maps onto market value (P_{it}) non-trivially, i.e., g is not a constant.

³ Inclusion of book value in the valuation model is justified on the ground that book value is hypothesized to be (i) informative of expected future normal earnings; (b) an approximation of abandonment value; and (c) a control for scale differences (Collins, Pincus and Xie. 1999).

incremental earnings has shown an upward trend with time; (ii) the combined explanatory power of consolidated earnings and book values has increased over time; (iii) the explanatory power of consolidated incremental earnings, like parent-only earnings has also increased over time; (iv) the combined explanatory power of consolidated earnings and book values after controlling for unconsolidated earnings and book values has been found to possess incremental information content and finally (v) both individual shareholding and leverage (individual shareholding) explain a good portion of the variation in combined adjusted R^2 (incremental earnings R^2 .)

The paper proceeds as follows. Section two briefly explains the financial reporting environment of Japan. Section three reviews existing literature on value relevance of book values and earnings that includes literature on time-series behavior of value relevance measures of accounting numbers. Furthermore, it includes a review of the literature on value relevance of parent-only and consolidated accounting numbers in the context of Japan. The next section deals with research design issue. Section five describes sample and data. Empirical results and discussion thereof are presented in section six. Section seven presents sensitivity analysis. Section eight concludes.

II. *Financial Reporting Environment of Japan and Relevance of Accounting Numbers*

Nobes (1983) classify Japanese accounting practice as belonging to the macro-uniform category and further classify under the government sub-class in the law-based family. Compared to microeconomic group where accounting attempts to reflect economic reality and consequently is flexible (e.g., USA, UK), accounting in the macroeconomic group has developed as an instrument of national economic policies, characterized by high conformity between tax and financial accounting. In addition, Japan is characterized to have a predominantly bank-oriented financial system. In this type of financial system, businesses (i) have very close ties to banks; (b) banks have direct access to company information and therefore have relatively little interest in external financial reporting; and (c) banks have concentrated and long-term debt and equity holdings.

Tax law has a heavy influence on Japanese accounting. Many expense allowances, calculated on the basis of past experience rates in the U.S., must be recorded in Japanese financial statements at percentages provided by tax authorities. In addition, companies may create special reserves to allow them to claim special tax deferrals (Haskins, Ferris and Selling 2000). Linking tax policy to financial reporting practices inevitably distorts the presentation of corporate performance in financial statements by encouraging managers to maximize tax benefits rather than to strive to reflect true and fair representation of companies' economic substance.

A key characteristic of Japanese style of corporate governance is cross-corporate, interlocking ownership through investment in the equity of other firms. Over the period 1976-1999, financial institutions and other corporations held, on average, 63% of outstanding shares of Japanese firms while the comparable figure for individuals is only 29%. This style of corporate governance allows value-relevant (inside) information about a firm's prospect and/or business strategies to be shared exclusively within the cross-owned network through direct communications between managers and cross-corporate shareholders (Jiang and Kim 2000). This, too, reduces demand for published accounting information among these cross-corporate

networks.

Also, compared to the microeconomic group, the quality of independent audits is low, and the lack of sufficient level of governance such as independent outside directors weakens the confidence of investors with respect to the quality and relevance of accounting information in the market.

It can be concluded from the discussion above, that accounting numbers may not be relevant enough for outside investors for equity valuation purposes. However, on the other side of the coin, there are also factors that could point towards the usefulness of accounting numbers such as earnings and book values of equity for stock valuation in Japanese stock market.

An important determinant of the use of published accounting numbers is the lack of alternative information sources. In Japan, alternative information sources like, analysts' forecasts, conference calls, earnings pre announcements etc. are not well developed. Moreover, in recent years, companies have become more aware of the importance of direct financing from individual investors. This is because, banks, which have been the traditional source of finance in Japan, are having problems of their own in the form of huge amount of bad loans and can't afford to lend as much as they used to do. This is evident from the substantial reduction in debt equity ratio from 1.23 in the 1976-89 periods to .81 in the 1990s (author's calculation). This forces managers to provide information that is more oriented to the shareholders' needs. Furthermore, the BADC recognized the growing need to introduce a number of relevant standards to bring Japanese accounting more in line with international practices. Examples include: accounting standards for lease transactions (1993), accounting standards for research and development expenditures (1998), accounting standards for post-retirement benefits (1998), accounting standards for tax effect accounting (1998), accounting standards for financial instruments (1999) etc. This development is expected to make the accounting numbers more value relevant for investors.

The discussion above remains silent as to which form of the financial statements, parent-only and/or consolidated, is more important to investors. This problem does not arise in the financial reporting context of USA, UK and many other developed countries because in these countries consolidated statements are the primary means through which company information is presented to outsiders. However, Japan allows both parent-only and consolidated statements to be reported. The question that inevitably arises is which of the two provide more value relevant information or is it that both are equally important. There are three ways in which the information in consolidated and single-entity reports can relate to each other [Ely and Pownall 2000].

- (a) Consolidated reports better reflect the performance and financial position of the economic entity than single entity reports. This underlies U.S. GAAP requirement of consolidated reporting alone.
- (b) Consolidated and parent-only reports may be complementary in that each provide relevant but different information. This underlies Japan and several other countries' policy of disclosing both consolidated and parent only reports.
- (c) The reports may act as substitutes, i.e., both reflect sufficiently similar information so that it does not matter which report is evaluated.

Consequently, it is an empirical question of whether accounting information is useful to investors in the Japanese stock market and also which of the above three relationship between

parent and consolidated reporting best describes the relationship between the two.

III. *Review of Literature*

Research concerned with the relation between accounting number and stock price spans decades. In this section, I summarize recent research that employed research methods similar to mine. Also reviewed the literature on the relative value relevance of consolidated financial reports in the context of Japan.

CMW (1997) estimate yearly cross-sectional regressions of price on earnings and book values (to determine the combined value relevance), as well as price on book values alone (to determine incremental earnings) and price on earnings alone (to determine incremental book values) from 1953 to 1993 using 115,154 U.S. firm-year observations and report that, (i) combined value relevance of earnings and book values has increased slightly, (ii) in terms of incremental explanatory power of book values and earnings, incremental R^2 from earnings has declined over time while that of book values has increased. They report a pooled earnings (book values) coefficient of 3.41 (0.54) and a combined R^2 of 0.54.

Francis and Schipper (1999) employ the conventional price, book value and earnings regression to determine whether value relevance has declined over time or not. Result show no evidence of a decline in value relevance. They report an average book value coefficient of 0.25, earnings coefficient of 6.70 and an adjusted R^2 of 0.62. Their sample period range form 1953 to 1994 and include 97,009 U.S. firm-year observations.

Lev and Zarowin (1999) provide evidence that value relevance of earnings and book values has decreased over time in the U.S. This is in contrast to the results reported by CMW and Francis and Schipper. Lev and Zarowin's sample covers firm years between 1977 and 1996. On the other hand CMW sample ends in 1993. The period from 1994 to 1996 in Lev and Zarowin's sample exhibit lower R^2 compared to earlier periods. This, may have caused the inconsistency between the two studies.

Black, Sellers and White (2000) provide evidence on how accounting information, i.e., earnings and book values, is used differently in equity pricing in three countries, Germany, Japan and the U.S. They hypothesize that value relevance of combined book values and earnings model, and of the earnings model on a stand-alone basis would be greater in the U.S. than in Germany and Japan (because of tax conformity, conservatism, relationship banking etc.). However, for the book values model the opposite would hold true. Result of the earnings alone model support the prediction. But the combined book values and earnings model has greater value relevance for Germany than for the U.S. Also, book values alone model is supported for Germany only. Decreased value relevance across all three models is observed for Japan (sample observations 8,596 over the period 1986 to 1995) with an R^2 of .5774, .4541 and .5324 for combined, earnings alone and book value alone model respectively.

Ali and Hwang (1999) use data from manufacturing firms from 16 countries over the period 1986-1995 to test the relationship between country-specific factors and the combined value relevance of book value and earnings, among others. They find that for countries with bank oriented financial systems, public standard setters, continental model classification, tax rules significantly influencing financial accounting measurements and low spending on audit services, value relevance of accounting information is lower. Japan belong to this category.

Usui (1999) report combined adjusted R^2 for a model that regresses price on book values and earnings of just 0.40 using 11,349 parent-alone firm-year observations over 1980 to 1998. Coefficient on earnings and book values are 9.51 and 0.93 respectively. For the earnings (book values) alone model, the adjusted R^2 s are 0.26 (0.34) respectively. However, he does not study whether there is any systematic change in the combined, incremental earnings and incremental book value R^2 over time and whether the changing nature of Japanese corporate governance system can explain such variation.

Review of literature on the value relevance of consolidated disclosure in Japan:

The issue of whether consolidated disclosure provides incremental value relevant information has produced mixed evidence. Lowe (1990) argues that U.S. consolidated financial statement rules based on the notion of control through direct or indirect majority share ownership adopted by Japan, fails to reflect traditional Japanese alliances and hence provides a misleading picture. Traditionally, Japanese companies have been allied through major industrial groupings called *Keiretsu*, which are based on non-contractual stakeholder relationships, including interlocking directorships and mutual shareholdings of less than 20%. Because ownership interests are so low, consolidated statements do not reflect these alliances.

McKinnon (1986) performs a test of correlation between share ownership and corporate classification on 1980-81 edition of Dodwell's four category ranking scale for group affiliation and finds a spearman rank correlation of .33 on a sample of 758 listed companies. This signifies the importance of non-ownership criteria relative to share ownership criteria for consolidation. McKinnon concludes that "[Since] share ownership is only one criterion among many that form among Japanese corporations, it must be concluded, therefore that, Anglo-American methods of consolidation fail to reflect adequately the nature of corporate group associates in Japan" (p.30)

Using a sample of 1,300 firm-year observations over 1979-87, Darrrough and Harris (1991) test for an association between unexpected consolidated earnings and unexpected returns. They use three proxies for unexpected consolidated earnings namely, random walk unexpected earnings (RWUE), management forecast based unexpected earnings (MFUE) and an unexpected consolidated earnings variable imputed from the parent data (PFUE). Results show a poor association between unexpected consolidated earnings and abnormal return (standardized cumulative abnormal returns, SCAR). Rank order correlation between RWUE and SCAR is negative -0.011 , that of between MFUE and SCAR, although positive is not statistically significant. Only for PFUE, a statistically significant correlation is obtained (.064).

On the other hand, Sakakibara et al. (1988) present evidence that is consistent with incremental value relevance of consolidated numbers given parent-alone accounting numbers. Their model use cumulative abnormal returns (CAR) from day -15 to $+15$ as the dependent variable and unexpected consolidated ordinary and net income as the independent variables. The coefficient on ordinary income variable is .0036 with a T-statistics of 2.43, and of the net income variable is .0036 with an associated T-statistics of 2.47. This result supports the view that consolidated announcement has information content after reacting to parent-only accounting numbers. However, looking at the behavior of CARs, they concluded that the Tokyo Stock Exchange (hereafter TSE) is not at all efficient with respect to the consolidated earnings

information, since price adjustment to consolidated earnings occurred in and after the announcement day.

Ely and Pownell (2000) hypothesize that consolidated earnings and book values are incrementally more value relevant than unconsolidated accounting data, for the shareholder-focused firms that are listed in both the U.S. and Tokyo (USL firms) than for a matched sample of firms traded in Japan but not in the U.S. (NUSL firms). The sample consists of 23 Japanese firms that were listed on major U.S. stock exchanges during 1988-96 (USL firms) and 23 industry and size matched Japanese firms which were not traded on U.S. exchanges during the period. However, the result does not support their hypothesis in that the coefficients on consolidated earnings after controlling for parent-only earnings is significant in both the USL and NUSL regressions and coefficient on consolidated book values after controlling for parent-only book values is not significant in either the USL or the NUSL regressions.

Ito (1990) evaluates the incremental information content of consolidated earnings given parent-only earnings over the period of 1978-86 on a sample of 234 firms. Results indicate that consolidated earnings have significant incremental information content beyond that contained in parent-only earnings.

Yamaji (2000) investigates whether parent-alone or consolidated accounting numbers has greater explanatory power for stock price. Using a sample of 4,500 firm-year observations over 1990 to 1998, Yamaji finds that combined explanatory power of earnings and book values for the parent-alone model was higher from 1990 to 1995 compared to its consolidated counterpart. However, from 1996 the pattern reversed. Yamaji does not investigate whether consolidated accounting information is value relevant after controlling for parent-only numbers. Instead he examines price model for parent and consolidated basis in separate regressions. He too, does not investigate the possible factors that can explain such variation.

IV. *Research Design Issues*

This study investigates value relevance of accounting information using a price-based approach (often called level analysis). However, the majority of market based research studies have chosen to model returns rather than price as the dependent variable. It is important to note that returns and levels specification do not address the same research question. Returns specification can be used to determine whether independent variables reflect information that, over a specific period of time, i.e., the returns window, causes investors to change their beliefs and consequently stock prices (captures the timeliness notion of financial reporting). On the other hand, levels specifications can be used to determine whether accounting variables reflect information associated with variables used to price shares over all periods upto a specific point of time [Barth and Clinch 1999].

A number of researchers [Gonedes and Dopuch 1974, Lev and Ohlson 1982, Christie 1987, Landsman and Magliolo 1988, Kothari and Zimmerman 1995] evaluate the relative superiority of price and returns models.⁴ Kothari and Zimmerman (1995) argue that since

⁴ Gonedes and Dopuch (1974) argue that return models are theoretically superior to price models in the absence of well-developed theories of valuation. Lev and Phlson (1982) describe the two approaches as complementary. Landsman and Magliolo (1988) show that level models can dominate returns models, for example, when model parameters and omitted variables are not intertemporally constant.

prices lead earnings (as documented by Beaver, Lambert and Morse 1980), the slope or earnings response coefficient is substantially less biased in price than in returns models. However, this improved specification is not without cost. The most severe econometric problem that is encountered in price-based models is the presence of heteroscedasticity. To mitigate this problem, Easton and Sommers (2000) and Brown, Lo and Lys (1999) suggest deflating both the dependent and independent variables by sales and lagged market capitalization respectively. On the other hand, Barth and Kallapur (1996) suggest, (i) using a scale proxy as an independent variable instead of deflating regression variables by a proxy for scale, and (ii) using White (1980) heteroscedasticity-consistent standard error estimates.⁵ This approach is followed in the present study with total assets per share being used as the scale proxy.

Another advantage of using price models instead of the returns models is that, the latter only allows us to assess the value relevance of accounting earnings, whereas price based models show how a firm's market value of equity is related to both book values of equity and earnings. Because these two components of accounting information play different roles in equity valuation, investigation of both earnings and book value is important.

However, since the controversy regarding whether to model price or returns as the dependent variable has not been resolved yet, I present results based on a first-difference version of the dependent and independent variable as a robustness check.

Valuation model and R² decomposition technique:

Ohlson (1995) derives the following valuation model that links accounting data directly to equity valuation:

$$P_{it} = BV_{it} + \sum_{i=1}^{\infty} [(1+r)^{-i} E_t(X_{t+i}^a)] \quad (1)$$

Where, P_{it} is security price of firm i at time t , BV_{it} is book value of equity for firm i at time t , X_{t+i} is accounting earnings for period $t+i$, and r is the cost of equity capital. X_{t+i}^a is $t+i$ period abnormal earnings and calculated as $[X_{t+i} - r \cdot BV_{t+i-1}]$. Collins et al. (1999) derive the following model from Ohlson's (1995) abnormal earnings model:

$$(P_t + d_t) = a_0 + a_1 BV_{t-1} + b_1 X_t + \varepsilon_t \quad (2)$$

The dependent variable in equation (2) is the cum dividend price, while X_t is the current period earnings and BV_{t-1} is the beginning of year book value.

Although this model has the advantage of independently examining earnings of this year and book values of the previous year, researchers usually employ the following model in examining the value relevance of accounting information:

$$P_{it} = a_0 + a_1 BV_{it} + b_1 E_{it} + \varepsilon_{it} \quad (3)$$

Where, P_{it} is the price of a share of firm i at fiscal year-end. BV_{it} is the book value per share of firm i at the end of year t , E_{it} is the ordinary income per share of firm i for year t . Previous

⁵ If the true scale factor is known then deflation by a scale proxy that is highly correlated with true scale factor worsens the coefficient bias. On the other hand, they show that when the scale proxy is an independent variable rather than a deflator, the coefficient bias is about four times smaller than the deflated model.

studies employed different measurement dates for the dependent variables; for example, CMW (1997) use price three months after the year end while Barth et al. (1998) use price as of fiscal year end. Where the objective of the study is to investigate the value relevance of a particular accounting item, and this item is unlikely to be known with accuracy before the release of the financial statements, it is reasonable to measure the dependent variable on the date financial statements become available. However, in this case post-year events could add noise to the measurement process. On the other hand, when the information is likely to be known at the financial year-end or reliable forecasts are widely available, a strong case can be made for using the value at the financial year-end (Ress 1997). The latter approach is followed here.

To compare the explanatory power that earnings and book values have for price, a decomposition technique used in Easton (1985) is employed. Total explanatory power (R_T^2) is decomposed into three parts: (1) the incremental explanatory power of earnings (incr EARN), (2) the incremental explanatory power of book values (incr BV), and (3) the explanatory power common to both earnings and book values (incr COMMON). To put it formally, let

$$P_{it} = a_0 + a_1 BV_{it} + \varepsilon_{it} \quad (4)$$

And

$$P_{it} = b_0 + b_1 E_{it} + \varepsilon_{it} \quad (5)$$

The coefficients of determination from Eqs. (3)-(5) are denoted R_T^2 , R_{BV}^2 , and R_{EARN}^2 respectively. Then $R_T^2 - R_{BV}^2 = \text{Incr EARN}$, and $R_T^2 - R_{EARN}^2 = \text{Incr BV}$. The remaining $R_T^2 - R_{\text{incr BV}}^2 - R_{\text{incr EARN}}^2 = \text{Explanatory power common to both earnings and book values (COMMON)}$.

I use this R^2 decomposition to investigate whether the value relevance of parent-only as well as of consolidated accounting information in Japan has changed over time. Specifically the following regressions are conducted.

$$R_{T(\text{type})}^2 = c_0 + c_1 \text{TIME}_t + \varepsilon_t \quad (6)$$

$$\text{Incr BV}_{(\text{type})} = d_0 + d_1 \text{TIME}_t + \varepsilon_t \quad (7)$$

$$\text{Incr EARN}_{(\text{type})} = e_0 + e_1 \text{TIME}_t + \varepsilon_t \quad (8)$$

Where $\text{TIME} = 1, \dots, 24$, corresponds to the sample years 1976 to 1999 for parent-only and $1, \dots, 16$, corresponds to the sample years 1984 to 1999 for consolidated numbers, and *subscript type* denotes whether the dependent variable is derived from parent-only analysis or from consolidated analysis. Whether, total or incremental explanatory power of earnings and book values has decreased (increased) over time can be investigated by looking at whether c_1 , d_1 , e_1 are significantly negative (positive).

To assess whether consolidated accounting numbers are incrementally value relevant after controlling for parent-only accounting data for Japanese stock prices, the following equation is employed:

$$P_{it} = a_0 + a_1 BV_{itpar} + a_2 [BV_{itcon} - BV_{itpar}] + b_1 E_{itpar} + b_2 [E_{itcon} - E_{itpar}] + \varepsilon_{it} \quad (9)$$

Where, variables are defined as before except that the *subscripts par and con* denote parent-only numbers and consolidated numbers respectively.

V. Sample Selection

Two sets of samples are used. Since Japanese financial markets have historically perceived parent-only statements as the primary financial statements, a relatively longer time series of parent-only sample has been selected for the period 1976 to 1999.⁶ For examining the value relevance of consolidated data, sample period 1984 to 1999 has been chosen. Although the BADC recommended filing audited consolidated statements from 1978, it was not until 1984 that most companies started to prepare consolidated financial statements. Since the main purpose is to evaluate whether consolidated accounting numbers are value relevant after controlling for parent numbers, parent-only data for companies that prepared consolidated statements was also collected. Hence, there is an overlap between parent-only data over 1976-99, and that of 1984-99. The selection criteria employed are as follows:

- (a) Firms listed in the first section of TSE over the period 1976 to 1999 are selected. Although a second section was added in 1961, stocks traded in the first section are the top rated and most actively traded companies.
- (b) At least two consecutive years of complete price, earnings, book values and number of share outstanding data must be available. The stock price is collected from *Kabuka Soran* published by *Toyo Keizai Shinbunsha*. Accounting data are taken from the *Nihon Keizai Shinbunsha (Nikkei) NEEDS* database.
- (c) While a Japanese firm may choose any month as its accounting cycle end, several firms have changed their calendar month to March over the years. As in Hall et al. (1994), I drop observations when there is an irregular number of months in an accounting cycle because of change.
- (d) Financial firms (insurance, banking and securities firms) are excluded. Accounting practices of these firms are so distinct that their valuation parameters are likely to be substantially different from those of industrial firms.

The above selection process along with eliminating firm-year observations with negative book values resulted in a sample of 18,436 parent-only and 12,327 consolidated firm-year observations. Firms with negative book values are likely to be in financial distress and may be worth studying in their own right and hence excluded from this analysis. To remove the effects of outliers I delete the top and bottom 1% of book-to-market ratio observations and observations with absolute studentized residuals greater equal to four in the first phase of regression of price on earnings and book values in every year. The final sample consisted of 17,900 parent-alone and 11,980 consolidated observations.

Tables 1 and 2 present descriptive statistics and correlation analysis for the parent-only sample respectively. Price has a mean (median) value of ¥801.89 (¥582.00). Book values (parent) and earnings (parent) has mean (median) of ¥355.95 (¥263.22) and ¥42.44 (¥30.29) respectively. There is substantial variation in firm size with mean (median) MVE of ¥163,213.16 million (¥56,312.20 million) and a standard deviation of ¥399,501.60 million.

⁶ Initially I thought of performing the analysis over the period 1970 to 1999 to have a long time series of data. However, during 1970-75 periods over 80% of the sample companies produced half-yearly financial statements. Since it is usual in value relevance research to regress price on annual earnings and book values, annual data from 1976 has been used.

TABLE 1. DESCRIPTIVE STATISTICS FOR PARENT-ONLY FIRM-YEAR OBSERVATIONS
SAMPLE PERIOD 1976-1999^a

Variable ^b	Mean	Standard deviation	1st quartile	Median	3rd quartile
Price (P)	801.89	776.05	330.00	582.00	990.00
Book value (BV)	355.95	330.54	147.33	263.22	447.22
Earnings (E)	42.44	53.55	13.30	30.29	58.70
Total assets (TA)	1113.72	819.98	628.12	865.93	1299.76
Market value (MVE) (In million yen)	163213.60	399501.60	24726.53	56312.20	143610.30
Book to market ratio	0.51	0.33	0.31	0.47	0.65
Earnings to price ratio	0.05	0.08	0.03	0.05	0.08

^a The number of firm-year observations is 17,900.

^b P is the price of a share i at year-end t . E is the ordinary income per share of firm i for year t . BV is the book value per share of firm i at year-end t . TA is the total assets per share of firm i for year t . MVE is the market value of equity for firm i at the end of year t (share price * number of outstanding shares).

TABLE 2. CORRELATION AMONG INDEPENDENT AND DEPENDENT VARIABLES^a

Variable ^b	Price (P)	Book Value (BV)	Earnings (E)	Total assets (TA)
Price (P)	1.00	.71	.64	.42
Book Value (BV)	.75	1.00	.63	.54
Earnings (E)	.73	.70	1.00	.41
Total Assets (TA)	.38	.50	.39	1.00

^a The number of firm-year observations is 17,900. The lower diagonal represents Pearson correlations while the upper diagonal represents Spearman correlations. All of the above coefficients are significant at .01 level.

^b P is the price of a share i at year-end t . E is the ordinary income per share of firm i for year t . BV is the book value per share of firm i at year-end t . TA is the total assets per share of firm i for year t .

Mean (median) book-to-market ratio is 0.51 (0.47) and mean (median) earnings-to-price .05 (.05) respectively. Table 2 contains correlation coefficients between dependent and independent variables. As expected, book values and earnings are positively correlated with price with a Pearson (Spearman) correlation of .75 (.71) and .73 (.64) respectively. Both book values and earnings are also positively and significantly correlated with each other .70 (.63). Since both book values and earnings are highly intercorrelated, multicollinearity could be a problem. Gujarati (1995) suggests that if the pair-wise correlation coefficient between two regressors (book values and earnings in the present case) is in excess of 0.80, then multicollinearity is a serious problem. Although the pair-wise correlation in the present case is 0.70, I still check for multicollinearity by examining the variance inflation factor (VIF) of earnings and book values. As a rule of thumb, if the variance inflation of a variable exceeds 10, that variable is said to be highly collinear (Gujarati 339). In the pooled regression of price on book values and earnings the VIF is 2.21 and 1.94 for book values and earnings respectively, which is far below the critical level of 10. In yearly regressions too, multicollinearity was not a problem since the maximum VIF obtained was 4.47 and 4.45 for book value and earnings respectively in 1982.

Tables 3 and 4 present descriptive statistics and correlation analysis for the consolidated sample along with the matched parent sample respectively. Book values (consolidated) and earnings (consolidated) have mean (median) of ¥499.27 (¥366.19) and ¥23.40 (¥16.17)

TABLE 3. DESCRIPTIVE STATISTICS FOR CONSOLIDATED AND MATCHED PARENT OBSERVATIONS. SAMPLE PERIOD 1984-1999^a

Variable	Mean	Standard Deviation	1st quartile	Median	3rd quartile
BV _{con}	499.27	549.27	214.63	366.19	608.93
E _{con}	23.40	57.97	5.69	16.17	34.09
TA _{con}	1490.40	1229.68	825.40	1144.65	1736.78
BV/P ratio (consolidated)	0.56	0.37	0.31	0.47	0.69
E/P ratio (consolidated)	0.05	0.06	0.03	0.05	0.07
BV _{par}	474.35	508.91	208.66	351.30	578.03
E _{par}	21.44	52.99	6.32	14.60	29.90
TA _{par}	1241.55	988.00	700.94	961.04	1469.21
BV/P ratio (parent)	0.54	0.38	0.30	0.46	0.67
E/P ratio (parent)	0.04	0.05	0.02	0.04	0.06

^a The number of firm-year observations is 11,980.

^b E is the ordinary income per share of firm i for year t . BV is the book value per share of firm i at year-end t . TA is the total assets per share of firm i for year t . BV/P and E/P ratios are book to market and earnings to price ratios respectively. Subscripts con and par denote "consolidated" and "parent" respectively.

TABLE 4. CORRELATION ANALYSIS^a

Variable	Price	BV _{par}	BV _{con}	BV _{diff}	E _{par}	E _{con}	E _{diff}
Price	1.00	0.61	0.64	0.26	0.71	0.71	0.34
BV _{par}	0.82	1.00	0.96	0.20	0.66	0.62	0.22
BV _{con}	0.84	0.98	1.00	0.37	0.68	0.66	0.30
BV _{diff}	0.39	0.29	0.46	1.00	0.29	0.39	0.55
E _{par}	0.86	0.81	0.82	0.32	1.00	0.96	0.39
E _{con}	0.87	0.80	0.83	0.46	0.96	1.00	0.59
E _{diff}	0.45	0.36	0.45	0.63	0.37	0.61	1.00

^a The number of firm-year observations is 11,980. The lower diagonal represents Pearson correlations while the upper diagonal represents Spearman correlations. All of the above coefficients are significant at the .01 level.

Price: stock price at the end of fiscal year t .

BV_{par}: book values of parent equity per share.

BV_{con}: book values of consolidated equity per share.

BV_{con} - BV_{par}: difference between consolidated and parent book values of equity per share.

E_{par}: parent ordinary income per share.

E_{con}: consolidated ordinary income per share.

E_{con} - E_{par}: difference between consolidated and parent ordinary income per share.

respectively. Compared to consolidated number, parent book values and earnings has a mean (median) of ¥474.35 (¥351.30) and ¥21.44 (¥14.60) respectively. The differences between consolidated and parent book values and earnings are statistically significant at the 1% level with a T-statistics of 25.59 for book value difference and 8.48 for earnings difference. Mean (median) consolidated book-to-market ratios are 0.56 (0.47), and earnings-to-price ratios are .05 (.05) respectively. While, Mean (median) parent book-to-market ratios are 0.54 (0.46) and earnings-to-price ratios are .04 (.04) respectively. The differences between consolidated and parent book-to-market and earnings-to-price ratios are also statistically significant at 1% level.

Table 4 presents the correlation analysis. Both parent and consolidated book values and

TABLE 5. YEARLY CROSS-SECTIONAL REGRESSIONS OF PRICE ON EARNINGS AND BOOK VALUE, SAMPLE PERIOD 1976-1999.

Models:										
$P_{it} = a_0 + a_1 BV_{it} + b_1 E_{it} + \varepsilon_{it}$ (3)										
$P_{it} = a_0 + a_2 BV_{it} + \varepsilon_{it}$ (4)										
$P_{it} = a_0 + b_2 E_{it} + \varepsilon_{it}$ (5)										
Year	N ^a	a ₁	b ₁	(A) Adj. R ²	a ₂	(B) Adj. R ²	b ₂	(C) Adj. R ²	(A)-(C) Incr.BV	(A)-(B) Incr.Earn
Average ^a (1976-79)	614.75	1.23 (8.53)	2.22 (6.24)	.77	1.84 (17.62)	.72	5.12 (17.87)	.66	.11	.04
Average ^a (1980-89)	714.30	1.08 (5.61)	5.12 (5.80)	.67	1.98 (12.34)	.61	9.02 (13.19)	.62	.05	.06
Average ^a (1990-99)	830.10	.98 (9.59)	6.68 (8.46)	.77	1.69 (14.77)	.66	10.69 (14.38)	.66	.11	.11
Pooled (1976-99)	17900	1.10 (30.30)	5.98 (27.27)	.65	1.75 (48.87)	.56	9.98 (44.38)	.55	.10	.09

^a Average represents average number of firms per year, average of the coefficients and t statistics in parentheses of the annual regression.

Notes: Coefficient estimates are based on ordinary least-squares estimation. All the above equations are estimated with total assets per share as a proxy for scale. However, for the sake of brevity, coefficient estimates of the intercept term and the scale proxy are omitted from the above table. White's heteroscedasticity-corrected T-statistics are presented in parentheses which assumes that the residuals of the estimated equation are serially uncorrelated. However, where both heteroscedasticity and autocorrelation of unknown form have been encountered, Newey and West (1987) standard errors have been used.

P is the price of a share i at year-end t . E is the ordinary income per share of firm i for year t . BV is the book value per share of firm i at year-end t .

ordinary income numbers are highly correlated with stock price and with one another. Also the difference between consolidated and parent book values (ordinary income) is positively and significantly correlated with price [Pearson coefficient .39 (.45) and Spearman coefficient .26 (.34)] respectively. To alleviate the concern of multicollinearity, VIF was calculated for consolidated book values and earnings by regressing prices on book values and earnings. For both pooled and separate-year regressions, VIF remained below 6.77 for book values and 6.61 for earnings which is below the critical level of 10.

VI. Empirical Results

1. Change in the value relevance of parent-only earnings and book values over time

Table 5 reports the regression results of equations (3)-(5) for three sub-periods as well as the pooled cross-sectional time series regression results. The pooled results indicate that parent-alone book values and earnings jointly explain about 65% of the cross-sectional

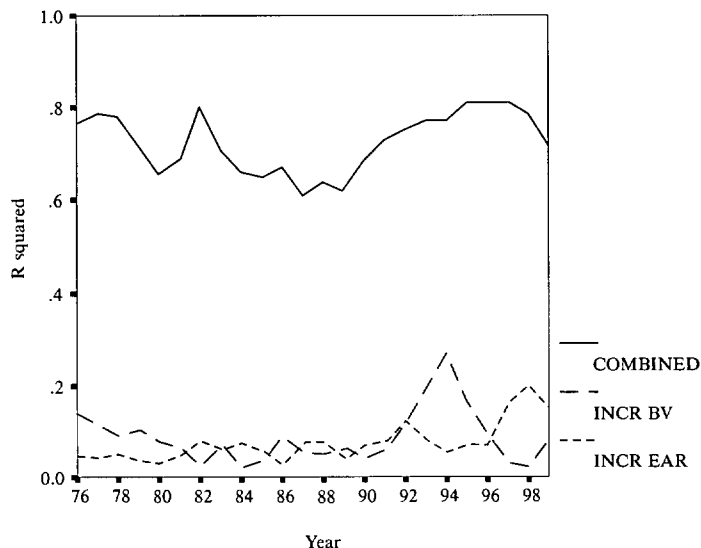
variation in stock prices over 1976 to 1999. Although year-by-year regression results show considerable variation, all yearly coefficients on book values and earnings are statistically significant at the .01 level. The untabulated result shows that in every year during the sample period, book values and earnings jointly explain more than 60% of the variation in stock prices with a high of 81% in the years 1995, 1996 and 1997 and a low of 61% in the year 1987. Based on the higher R^2 s and significant coefficients on book values and earnings, it can be concluded that these two fundamental accounting numbers provide value relevant information to investors.

Regarding coefficients of earnings, Kothari and Zimmerman (1995) suggest that, assuming earnings follow a random walk, the slope, commonly referred to as the earnings response coefficient (ERC), should be the reciprocal of the firm's expected rate of return, $1/r$. Specifically, if b_t is the current period *permanent shock* then the multiplier should be $1+r/r(b_t)$, if a_t is the current period *transitory shock* then the multiplier should be $1(a_t)$ and finally, if c_t is the *price irrelevant component* then the multiplier should be $0(c_t)$ [Ramakrishnan and Thomas. 1998]. Revsine, Collins and Johnson (2000) classify income from continuing operations (exclusive of special or nonrecurring items) to belong to the permanent category, income (loss) from discontinued operations and extraordinary gains and losses to the transitory category, and a change in accounting principles giving rise to a cumulative effect adjustment to income that has no future cash flow consequences to shareholders to value irrelevant component category. Since, in this paper ordinary income before extraordinary gains (losses) is employed, which is supposed to contain permanent component, the appropriate multiplier should be $1+r/r$. In the context of the U.S., it should be 11 to 13.5 assuming a discount rate between 10% to 8%. Assuming the same discount rate in the context of Japan, the ERC of 5.98 from the pooled model and an average of 5.29 from annual regressions is well below the theoretical level (the difference between the obtained value of 5.98 and theoretical value of say, 11 is highly significant, t-statistic, -20.88). Hence investors appear to perceive that ordinary income numbers contain transitory or value irrelevant components in addition to permanent components.

Regressing yearly R^2 s on a time trend variable (equation 6) reveals that contrary to the claim recently voiced that historical cost-based financial statements have lost their value relevance, no such trend has been found. On the contrary, value relevance has appeared to have increased slightly although this is not statistically significant [coefficient on TIME = .0023, t-statistic = 0.93].

Table 5 also presents the results of equation 4 and 5, which depicts incremental explanatory power of book values and earnings respectively. Pooled results suggest that book values provide a slightly higher incremental explanatory power from 1976 to 1999 compared to earnings [0.10 versus .09]. Black et al. (2000) argue that, in Japan, conservatism results in accounting earnings that may not portray the true economic performance of the firm. Tax conformity also distorts accounting income due to its focus on minimization of taxes, and since capital providers in Japan also function as suppliers of debt capital, they focus more on book value as a measure of firm's ability to pay its debt. To see whether or not incremental book values and earnings have changed or not with the passage of time, equation (7) and (8) are estimated. Results are as follows [t-statistic are in parentheses].

FIG. 1. TREND IN TOTAL AND INCREMENTAL EXPLANATORY POWER OF EARNINGS AND BOOK VALUES ACROSS TIME



$$\begin{aligned} \text{Incr BV} &= d_0 + d_1 \text{TIME}_t + \varepsilon_t \\ &\quad .070 \quad .0011 \\ &\quad (2.80) \quad (0.44) \\ \text{Incr EARN} &= e_0 + e_1 \text{TIME}_t + \varepsilon_t \\ &\quad .02 \quad .0043 \\ &\quad (1.58) \quad (3.09) \end{aligned}$$

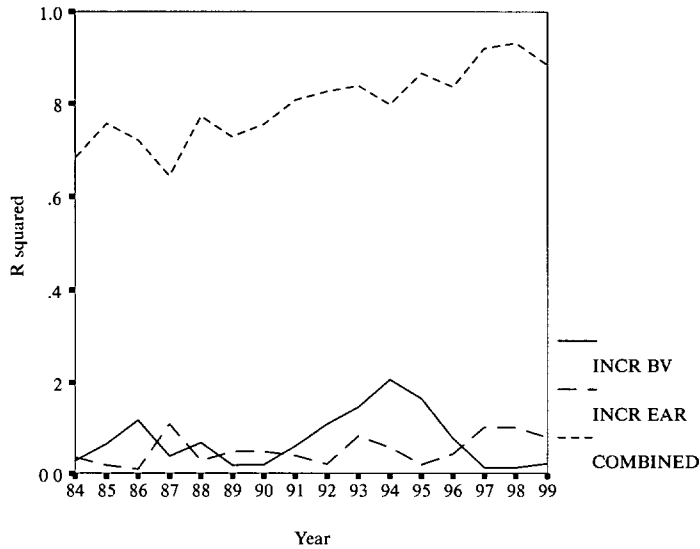
It is quite apparent from the coefficient on **TIME**, that the coefficient is positive but insignificant in the regression of incremental BV on **TIME**, but it is positive and statistically significant at the 1% level in the regression of incremental earnings on **TIME**.

Figure 1 shows the trend in total and incremental explanatory power of earnings and book values across time.

2. Incremental value relevance of consolidated accounting numbers:

The discussion in the preceding sub-section revealed that for parent-only data, the total incremental power of both book values and earnings (combined model) has increased over 1976-99, though it is not significant. The most pronounced effect was observed for the earnings alone model where the explanatory power of the model has shown a statistically significant positive trend over 1976-99. The same analysis was performed for consolidated data to assess the time trend over 1984-99. The result is produced below:

FIG. 2. TREND IN TOTAL AND INCREMENTAL EXPLANATORY POWER OF CONSOLIDATED EARNINGS AND BOOK VALUES ACROSS TIME



	Constant	TIME
Total R ²	0.68 (35.14)	0.015 (7.61)
Incremental BV	0.06 (1.13)	-0.00005 (-0.01)
Incremental EARN	0.03 (1.77)	0.003 (1.88)

For the combined model the coefficient on TIME is .015 which is significant at 1% level. It implies the combined explanatory power of consolidated earnings and book values has increased over time. Incremental explanatory power of the book value model has remained unchanged, while that of incremental earnings has increased (coefficient on TIME is .003 which is significant at 10% level, two tailed test).

Figure 2 shows the trend in Total and incremental explanatory power of consolidated earnings and book values across time

Table 6 presents evidence as to whether the consolidated book value and earnings numbers are incrementally value relevant after controlling for parent-alone book value and earnings numbers.

In both the pooled and the separate-year regressions of parent-alone and consolidated-alone models, coefficients on book values and earnings are statistically significant at the 1% level, and there is little difference between the adjusted R² for the parent-only regressions relative to consolidated regressions. Actually, consolidated book values and earnings explain 80% of the variation in price on a stand-alone basis compared to 79% explained by parent-only numbers in pooled regression. In terms of individual coefficients, both parent-only book values and earnings coefficient are greater than their consolidated counterparts.

TABLE 6. INCREMENTAL VALUE RELEVANCE OF CONSOLIDATED BOOK VALUE AND EARNINGS. SAMPLE PERIOD 1984-1999.

Model: $P_{it} = a_0 + a_1 BV_{itpar} + b_1 EAR_{itpar} + e_{it}$					
Model: $P_{it} = a_0 + a_1 BV_{itcon} + b_1 EAR_{itcon} + e_{it}$					
Model: $P_{it} = a_0 + a_1 BV_{itpar} + a_2 (\text{Diff. in BV})_{it} + b_1 EAR_{itpar} + b_2 (\text{Diff. in EAR})_{it} + e_{it}$ (9)					
<i>Panel A</i>					
<i>Pooled regressions</i>					
	a_1	a_2	b_1	b_2	Adjusted R^2
Parent-alone	0.91 (20.03)	—	8.63 (24.22)	—	0.79
Consolidated-alone	0.88 (19.64)	—	7.12 (24.68)	—	0.80
Parent-alone with difference C-U	0.85 (19.36)	0.87 (5.06)	8.07 (23.20)	3.85 (5.64)	0.81
<i>Panel B</i>					
<i>Sixteen separate-year regressions</i>					
Parent-alone	1.24 (7.93)	—	7.07 (7.77)	—	0.81
Consolidated-alone	1.19 (8.27)	—	5.57 (7.95)	—	0.81
Parent-alone with difference C-U	1.14 (7.95)	0.54 (1.98)	6.80 (9.80)	2.66 (2.52)	0.82

The total number of firm-year observations is 11,980 for the pooled sample and the average number of observations per year is 748.75 for the separate-year regressions.

Notes: Coefficient estimates are based on ordinary least-squares estimation. White's heteroscedasticity-corrected T-statistics are presented in parentheses which assumes that the residuals of the estimated equation are serially uncorrelated. However, where both heteroscedasticity and autocorrelation of unknown form has been encountered, Newey and West (1987) standard errors have been used.

Pit = Stock price at fiscal year-end

BV_{it} = Book value of equity per share at end of year for firm i, calculated as either unconsolidated (U) or consolidated (C)

EAR_{it} = Ordinary income per share for firm i for the period t, calculated as either unconsolidated (U) or consolidated (C).

Diff. in BV is $(BV_{con} - BV_{par})$ and Diff. in earnings is $(EAR_{con} - EAR_{par})$.

The third regression is a direct test of equation (9) which addresses the incremental explanatory power of consolidated numbers once parent-only numbers are controlled for. Looking at coefficients pertaining to a_2 and b_2 it can be concluded that both consolidated book values and earnings are value relevant after controlling for parent-only accounting numbers. Particularly, the coefficient on the difference between consolidated and parent-only book values is .87 (0.54) with an associated t statistics of 5.06 (1.98) for pooled (separate-year regression) respectively. The former (latter) is statistically significant at 1% (5%) level. Similarly, the coefficient on the difference between consolidated and parent-only earnings is also positive and statistically significant [3.85 (2.66) with an associated t-statistic of 5.64 (2.52) for pooled (separate-year regression)] respectively. The former is significant at the 1% level while the latter is significant at better than the 2% level.

3. Empirical examination of the changing corporate governance system of Japan and its impact on value relevance of accounting information

So far empirical tests have been conducted to investigate whether there is any systematic change in the value relevance of accounting information. The analysis then naturally should proceed to investigate factors that could explain the observed changes. I choose to investigate the impact of changing corporate governance system on the value relevance of accounting information. This is because the role of corporate governance and financial reporting within a particular country's institutional context are inter-dependent.

Essential aspects of corporate governance are many, however, a possible list could include (i) the importance of large shareholders, (ii) the legal protection of shareholders, (iii) the extent to which relevant laws are enforced, (iv) the reliance on debt finance, (v) the structure of the board of directors, (vi) the way in which executives are compensated and (vii) the frequency and treatment of mergers and takeovers. But because of the availability of data on ownership structure and debt financing for the sample companies, I take these two variables as a crude proxy of corporate governance system of Japan and investigate whether these factors could explain the observed changes in the value relevance of accounting information.

(a) *The percentage of individual holdings and value relevance of earnings and book value:*

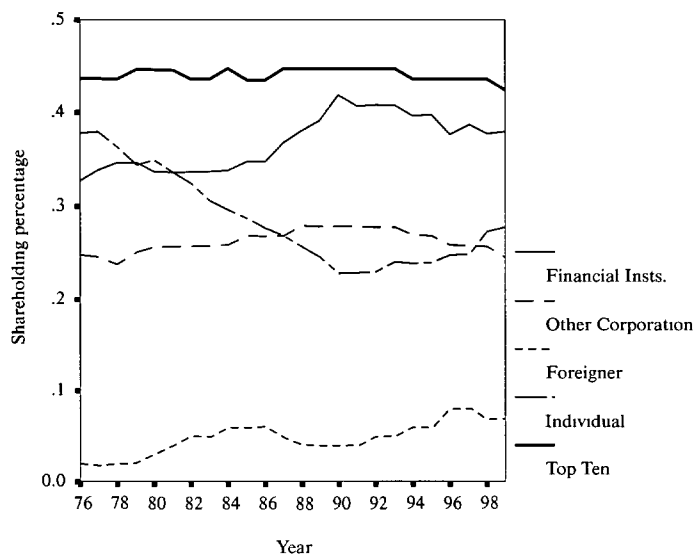
A key characteristic that distinguishes the Japanese style of corporate governance from its US counterpart is cross-corporate, interlocking ownership through investment in the equity of other firms. This results in a highly concentrated ownership structure in Japan (Jiang and Kim 2000).

The relative share of individual stockholding was 69.1% in 1949. However, this percentage has been gradually declining since then and in 1998 the relative share was 25.4%. On the other hand, the relative share of stockholding by financial institutions and corporate stockholding has been steadily increasing. In 1998, the share of financial institutions and corporations amounted to 63.4%. This latter group holds shares primarily to maintain their business relationships, rather than for financial gains. Hence, they are referred to as stable shareholders. This shareholding pattern allows value relevant information about a firm's prospect and business strategies to be shared exclusively within the cross-owned network through direct communication rather than relying on corporate financial statements. On the contrary, individual shareholders generate most of the trading activities in the Japanese stock market and since, competing information sources, such as analysts' forecasts, earnings pre announcements, conference calls occur far less frequently in Japan than in the U.S., investors have to rely on published financial statements to make relevant investment decisions. Hence it remains to be seen how the changing pattern of share ownership impacts the value relevance of accounting information.

(b) *Leverage:*

Historically Japanese firms have relied more heavily on debt financing (in particular, bank credits) than on equity financing. A highly levered firm has high financial and default risks and managers have the incentive to manipulate earnings to avoid debt covenant violations. This makes accounting earnings numbers less meaningful. On the other hand with the increased risk of default, investors in highly levered firms should pay more attention to book value number because this represents their abandonment value.

FIG. 3. DISTRIBUTION OF STOCKHOLDING OF SAMPLE COMPANIES BY TYPE OF INVESTORS



However, in Japan, the relationship between credit granting banks and borrowing companies are especially close and long-term. Banks exert sufficient influence to ensure that management actions are compatible with their goals. This monitoring allows independent shareholders to free-ride on the banks' monitoring activities and may result in increasing value relevance of accounting numbers for highly levered firms.

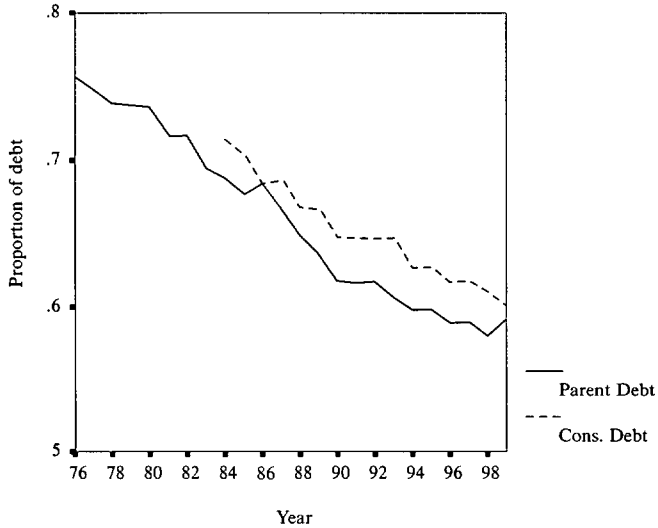
Figure 3 presents the distribution of stockholding of sample companies by type of investors between 1976 and 1999. Because data on ownership structure is available in detail for parent companies only, the discussion here is solely based on parent-alone numbers. Four major types of stockholding pattern are portrayed. These are, (i) Financial institutions, (ii) Corporate stockholders, (iii) Foreign stockholders, and (iv) Individual stockholders.

A glance at the figure will reveal that:

- The Relative share of financial institutions steadily increased from a low of 33% in 1976 to 42% in 1990. Then it started to fall and stood at 38% at the end of 1999.
- The relative share of corporate stockholding has not changed much with a high of 28% and a low of 25%.
- The relative of share of foreign stockholding has been increasing steadily from a low of 2% in 1976 to 8% in 1996 and 1997.
- The most pronounced effect can be observed in the individual stockholding category. It declined steadily from a high of 38% in 1976 to 23% in 1992. However, it started to increase thereafter and stood at 28% at the end of 1999.
- The relative stockholding of top ten shareholders has remained almost static at 44%, reinforcing the stable shareholding hypothesis among the top shareholders.

Regressing individual shareholding on a time trend variable generates a coefficient of

FIG. 4. VARIATION OF PARENT-BASED AND CONSOLIDATED LEVERAGE BY YEAR



-.0061 with a t-statistic of -4.54 [significant at the 1% level] that is consistent with the notion that individual shareholding steadily declined over the period. However, beginning from 1990 individual shareholding has started to increase, albeit gradually. Regressing the individual shareholding pattern on time trend variable over 1990 to 1999 generates a TIME coefficient of .005 with an associated t-statistic of 5.61 [significant at 1% level].

Figure 4 presents the variation in leverage measures for both parent-alone and consolidated numbers. Three leverage measures were employed. Leverage measure I was calculated by dividing total debt (both current and long term debt) by total assets and named DEBT 1. Leverage measure II was calculated by dividing total debt by market values of equity and termed DEBT 2. Finally, leverage measure III was calculated by dividing long-term debt by the sum of long-term debt and book values of equity and termed DEBT 3. However, since all the three measures produced the same result only result based on DEBT 1 is discussed here. Looking at figure 4 it becomes readily apparent that both parent and consolidated debt declined steadily over the sample period. Indeed, regressing parent debt (consolidated debt) on TIME produced negative coefficients on TIME of $-.0084$ ($-.0074$) with an associated t-statistic of -22.16 (-15.15) both of which are significant at 1% level. This reflects the fact Japanese managers relied more on equity financing as well as retained earnings instead of bank loans because of the gradually weakening power of banks in providing loans to companies.

Regression result:

I ran the following regression to determine whether the ownership and leverage structure of the sample companies could explain the variation in combined R^2 , incremental book value and incremental earnings R^2 for *parent-alone basis* since the ownership data is available in detail for parent-alone observations.

$$R_{it}^2 = a_0 + a_1 \text{TIME} + a_2 \text{HOLDING} + a_3 \text{DEBT} + e_{it} \quad (10)$$

TABLE 7. REGRESSION OF COMBINED R^2 , INCREMENTAL BOOK VALUE R^2 , AND INCREMENTAL EARNINGS R^2 ON TIME AND CORPORATE GOVERNANCE VARIABLES. SAMPLE PERIOD 1976-1999.

$$R_{it}^2 = a_0 + a_1 \text{TIME} + a_2 \text{HOLDING} + a_3 \text{DEBT} + e_{it} \quad (10)$$

Dependent variable	Constant	Time	Holding	Debt	Adjusted R^2
Combined R^2	2.54 (2.81)	-0.01 (-1.32)	2.09 (3.81)	-3.39 (-2.77)	0.33
Incremental book value R^2	1.08 (0.90)	-0.009 (-0.80)	0.26 (0.46)	-1.43 (-0.86)	0.00
Incremental earnings R^2	-0.06 (-0.10)	0.0066 (1.11)	0.68 (2.18)	-0.23 (-0.27)	0.58

Variable definitions: R_{it}^2 is combined, incremental book value and incremental earnings respectively. TIME is 1...24, corresponds to the years 1976-1999, HOLDING is the proportion of individual shareholding in every year from 1976 to 1999 and DEBT is the ratio of total liabilities divided by total assets in every year from 1976-1999.

Where R_{it}^2 denotes combined, incremental book value and incremental earnings respectively. TIME is 1...24, corresponds to the years 1976-1999, HOLDING is the proportion of individual shareholding in every year from 1976 to 1999 and DEBT is the ratio of total liabilities divided by total assets in every year from 1976 to 1999.

In the first regression when TIME alone is the explanatory variable the adjusted R^2 is merely .02. However, when HOLDING and DEBT are included as additional explanatory variables the adjusted R^2 increases to .33. The variable HOLDING has a positive coefficient and is statistically significant at the 1% level. This implies that as the proportion of individual shareholding increases so does the combined value relevance of accounting earnings and book values. This is consistent with the discussion made earlier that because of lack of alternative sources of information like earnings pre-announcements, analysts' forecasts, conference calls etc., individual shareholders rely on published financial information to make investment decisions. DEBT enters the regression with a negative coefficient of -3.39 with an associated t-statistic of -2.77 which is significant at the 1% level. This means as leverage increase the combined value relevance of earnings and book values decrease.

In the second regression neither HOLDING nor DEBT has any explanatory power for incremental book value R^2 . Although not tabulated, if the variable LOSS (the proportion of firms reporting negative earnings) is included as another explanatory variable the adjusted R^2 increases to .44 and the variable LOSS enters the regression with a coefficient of 1.08 implying that as the proportion of loss firms increases so does the value relevance book value information. This is expected because for firms reporting negative earnings, shareholders always have an option to liquidate the firm, and as a result, negative earnings are transitory for these firms. In this case, investors shift their attention from earnings and focus on book value.

In the third regression HOLDING is positive and statistically significant at better than the 2.5% level. DEBT, although it has the right sign, is not statistically significant. The adjusted R^2 is 0.58 which is the largest of the three sets of regressions. It was earlier noted that the individual shareholding pattern shows a different time trend over 1976 to 1999 with a gradual decline from 1976 to 1989 and then an increase from 1990 onwards. Parallel to this, both combined adjusted R^2 and incremental earnings R^2 increased in a significant way from 1990 to

1999. In the period from 1976 to 1989 total combined adjusted R^2 decreased with TIME registering a negative coefficient of $-.01$ and statistically significant at the 1% level whereas incremental earnings R^2 was not significant at all.

Hence it becomes apparent that changes in the individual shareholding pattern have a profound impact on the changing value relevance of accounting information. If this increasing trend of individual shareholding continues then what will be the future corporate governance system of Japan? The bank-centered monitoring system of Japanese companies received widespread acceptance during the 1980s, when the U.S. economy was performing poorly. Reformers argued for adopting the Japanese corporate governance structure into the U.S. system because the former had the desirable property of large and stable shareholding patterns. The Japanese mode of corporate governance was described as a state-contingent corporate governance system, where the management acts independently or is monitored by large shareholders when performance is good. However, if corporate performance becomes poor, then creditors and in particular, the firm's main bank initiate restructuring plan and discipline the poorly performing management.

The brighter aspects of the Japanese corporate governance system appeared during the time when the Japanese economy was going through a tremendous growth period i.e., early 1990s. However, as the Japanese banking crisis became evident, the superiority of bank-centered monitoring mechanism was questioned.⁷ Extant literature provides evidence that Japan's bank-centered corporate governance system suffers from certain drawbacks; (a) Bank financing makes the bank well-informed about the firm, it tends to make the firm hostage to the bank and hence enables the bank to extract rents. Also, when the bank does poorly and the firm has no alternative sources of funding, the firm has to cut investment even when it could invest profitably (Kang and Stulz 1997); (b) Banks induce clients to borrow more than profit maximization would allow and, in addition, banks influence client firms to adopt low-risk and low-return investment projects resulting in poor performance of main-bank-dependent firms in comparison with independent firms (Weinstein and Yafeh 1995); (c) Japanese main bank client firms invest more in imported technology than other firms which is consistent with the view that banks prefer low R&D expenditures because of their risky nature (Montalvo and Yafeh 1994); (d) Bank finance and governance is suitable for the financing of "traditional" manufacturing industries but is not appropriate for financing innovation (Carlin and Mayer 1998); (e) Assigning the task of corporate governance to banks, does not always lead to maximization of firm value because banks as creditors have different objectives from bank as shareholders.⁸ For example, banks intervene in the operation of their client firms if their cash flow or liquidity is poor, but not necessarily when share price performance is poor.

All these negative consequences along with the banking crisis led many firms to rely on

⁷ On the positive side, Hoshi et al. (1991) empirically show that Japanese style of bank-centered corporate governance makes investment of firms less sensitive to firm liquidity. Further, Kang (1993) provides evidence that Japanese firms with strong bank ties seem to make more profitable acquisitions.

⁸ Morck and Nakamura (2000) argue that although Japanese banks are both creditors and shareholders, there are many reasons for considering banks as creditors. First, banks' equity stakes were limited to 10% in non-financial firms in the 1950s, and this was reduced to 5% in the 1980s. In contrast, loans to non-financial firms are not limited. Second, the main banks in Japanese keiretsu implicitly guarantee the timely repayment of loans made to keiretsu members by other lenders. They make no such guarantee of dividend payment to other shareholders. Third, Japanese banks, implicitly commit to hold their equity stakes indefinitely. They therefore have little direct interest in maximizing the value of those stakes.

direct financing in the 1990s and hence a gradual increase in the individual shareholding pattern is apparent. The long-prevalent cross-shareholding system is increasingly put under pressure since firms faced with the ongoing economic slowdown are tempted to liquidate their holdings in other companies to avoid financial difficulties. Hence, the traditional bank-centered Japanese corporate governance system is slowly converging towards a market based one. Some evidence is there too. For example, managerial incentive schemes and stock option plans have been gradually introduced since 1997. But the other two aspects of Anglo-Saxon corporate governance system, namely, market for corporate control still remains inactive and boards of directors still are composed of insiders.

VII. *Robustness Check*

(a) **First-difference version of the price level:**

Kothari and Zimmerman (1995) note that while the estimated slope coefficients from price models are less biased than those from the return models, price models may suffer from serene heteroscedasticity and correlated omitted variable problem. Easton (1999) makes a similar observation and argues for returns specifications. Hence I include the first difference version of price as the dependent variable and examine whether the inference obtained from price models remains the same.

Table 8 presents regression results for the parent-alone model. For pooled sample both earnings change and change in BV is positive and statistically significant at the 1% level. For the separate-year regression, the mean earnings change coefficient is 2.02 with a mean t-statistic of 4.28. Mean t-statistic is significant at 1% level for 20 of the 23 years. For BV change variable, the mean coefficient is 1.04 with an associated mean t-statistics of 3.53. The coefficient is significant at 1% level in 15 out of 23 years. Hence, when change in price is modeled as the dependent variable, the inference regarding the value relevance of earnings and book value does not change. Regression results for consolidated based numbers (not tabulated) also reveal a similar pattern with earnings change and BV change variables are positive and statistically significant at the 1% level for both pooled and separate-year regressions.

(b) **March year-end only observations:**

Most of the Japanese companies have March fiscal year-end. To see whether earnings and book values play different role for these companies equation (3) was estimated for firms that have March fiscal year-end. Seventy one percent of my parent-only sample has March fiscal year-end. Results of equation (3) reveal an R^2 of .66 from the combined model, a book value coefficient of 1.05 and earnings coefficient of 6.43. Both these coefficients are highly significant. In terms of incremental explanatory power of earnings and book value models, both produced an adjusted R^2 of .10.

(c) **Change in interest rate:**

It is widely known that changes in interest rates have a negative impact on stock prices.

TABLE 8. ORDINARY LEAST SQUARES REGRESSIONS WITH CHANGE IN PRICE AS THE DEPENDENT VARIABLE. SAMPLE PERIOD 1977-1999.

Model:					
$\Delta\text{Price} = a_0 + a_1 \Delta\text{EAR}_t + \Delta\text{BV}_t + e_t$					(11)
Panel A: Pooled sample					
Variable	Without time effects		With time effects		
	Coefficient	t statistics	Coefficient	t statistics	
Earnings	1.30	14.82	1.20	14.06	
BV	0.81	7.85	0.67	7.24	
Time	—	—	-0.01	-14.85	
Adjusted R ²	0.08		0.12		
Observations	16,481				
Panel B Twenty three separate-year regressions					
Variable	Mean	# > 0	Mean	# > 2.58	Z statistics
Earnings	2.02	23	4.28	20	12.97
BV	1.04	23	3.53	15	9.29
Adjusted R ²	0.11				
Mean observations	716.57				

Variable definition: ΔPrice is $(\text{Price}_t - \text{Price}_{t-1}) / \text{Price}_{t-1}$, ΔEAR is $(\text{EAR}_t - \text{EAR}_{t-1}) / \text{Price}_{t-1}$, and ΔBV is $(\text{BV}_t - \text{BV}_{t-1}) / \text{Price}_{t-1}$.

This is because a decrease in market-wide interest rates reduces company's cost of equity capital and consequently increases share price. Also, as interest rates decrease, the yields on fixed-rate bond investments fall, making them less attractive to investors. This increases the demand for stocks and hence drives up the price. Recognizing this, equation 3 is estimated after incorporating an average risk free interest rate. As expected, the coefficient on the interest variable is negative though not statistically significant ($\text{INT} = -3.83$, $T\text{-statistics} = -.86$). However, coefficient on BV and EAR remains positive and statistically highly significant as before.

(d) Change in TOPIX as a potential factor influencing price:

The possibility that the sentiment of the share market is influencing the valuation of the firm is addressed including changes in TOPIX into equation (3). The coefficient of the market index has the expected positive sign and is significant (coefficient = .13, $t\text{-statistic} = 2.83$). However, the coefficient on book values and earnings variables remain virtually unchanged.

VIII. Concluding Remarks

This study provides an empirical investigation into the value relevance of accounting earnings and book values- two fundamental summary measures- in the context of Japan. This study is motivated by the market-based value relevance literature in the U.S. and the concern

that traditional historical cost based financial statements have become less value relevant. Using a sample of 17,900 parent-only firm-year observations and 11,980 consolidated firm-year observations, this study documents that accounting information is value relevant based on a price model. Both the pooled cross-section and time-series regressions and the year-by-year regression support the value relevance hypothesis.

Five major conclusions emerged from the empirical analysis.; (i) the explanatory power of parent-only incremental earnings has shown an upward trend with time; (ii) the combined explanatory power of consolidated earnings and book values has increased over time; (iii) the explanatory power of consolidated incremental earnings, like parent-only earnings has also increased over time; and (iv) the combined explanatory power of consolidated earnings and book values after controlling for unconsolidated earnings and book values has been found to possess incremental information content, (v) both individual shareholding and leverage (individual shareholding) explain a good portion of the variation in combined adjusted R^2 (incremental earnings R^2 .) Implications of these findings are discussed in light of their possible impact on the future of the Japanese corporate governance practices.

However, this study, has assumed that net income and book value figures are free of reporting biases; i.e., the average firm has no particular incentive to manage reported earnings. However an extensive body of research shows the presence of opportunistic management behavior. Future research could address the managerial incentives for earnings management and its impact on value relevance of accounting information.

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