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外資法人持股比例與股票評價攸關性之研究

Foreign Institutional Holdings  
and Value Relevance in Stock Valuation



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## 謝辭

新年後，幾次峻寒，春暖，花開，從初夏，到盛夏。從木棉樹的火紅蔓延到鳳凰又已經凋萎，蓮霧樹也結滿蓮霧終至熟透，掉落在管院外腳踏車停車場一角，瀰漫成一片酸腐的味道。這篇論文，在沉靜的時序更迭裡，日漸完成，當論文的文字並非用以表達心情，那些上上下下甚或是轟轟烈烈的情緒起伏，曾經被一股腦兒塞在什麼地方，竟已遍尋無著，這僅僅只是一兩個月以前的事情。原來跨越了這一道關卡以後，過去所有瑣碎的片段，是喜是怒或憂或樂，都付諸回憶。

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## Abstract

Following Taiwan's deregulation of foreign investor's stock holdings limits in 2001, the increase in the level of foreign institutional investment has posed great opportunity for Taiwan accounting academia to study investment behaviors, holding preferences of this new set of trader and its impact on Taiwan stock market. This study aims to study three topics: first, trend of value relevance in Taiwan from 1994 to 2007; second, the relationship between foreign institutional holdings and the extent investors utilize accounting numbers in stock valuation; and third, the roles foreign institutional investors play in their investees.

By market valuation regression models, this study empirically shows that trend of value relevance becomes steadier and higher after 2001; furthermore, higher level of foreign institutional holdings can elevate investors' reliance on earnings (equity book values) when valuing profit (loss) firms. In addition, this study also suggests that foreign institutional investors not only play fiduciary roles who self select into more financial healthy firm in the very first place; on the other hand, they also play governance roles that have implication of a firm's long-term profitability. However, in what way and to what extent foreign institutional investors dynamically affect their investees' operation prospects worth further investigation.

*Keywords: foreign institutional investors, value relevance, stock valuation*

## 摘要

本研究主要討論三個主題：台灣上市公司〔金融業除外〕自 1994 至 2007 年價值攸關性之變化、外資法人持股比例與股票評價攸關性，以及外資法人在被投資者中所扮演的角色。本研究利用「盈餘—帳面值—股價」的關聯模型，以及盈餘投資組合法檢驗攸關性之變化，發現台灣盈餘與權益帳面值的股價評價攸關性，在 2005 至 2007 年有明顯的提升，此外，攸關性之走勢在 2001 年以後也明顯較 2001 年以前平穩。此現象與台灣自 2001 年解除外資持股上限、2002 年加入世界貿易組織 WTO 以及近十年來之會計變革或有相關。

本研究著眼外資法人持股比重越來越高，以及持股比例係一量化指標，採用 Dhaliwal et al. (2005) 之方法，將外資法人持股比例加入市場評價模型，探討此因素是否會影響每股盈餘、每股帳面價值在股價評價攸關性之權重，實證結果顯示外資持股比重越高的公司，盈餘在有利潤之公司的股價評價權重越高，權益帳面值則是在有損失公司之評價權重越高。此外，本研究分別以資產報酬率、股東權益報酬率、負債比率控制財務健全度以後，外資法人持股比例對於正、負盈餘公司的盈餘、權益帳面值的評價權重仍有顯著且相同方向之影響，顯示市場認為外資機構投資人除了在持股選擇上扮演受託人與善盡忠實義務之角色以外，同時也在被投資公司之中扮演長期治理監督的角色。

關鍵詞：外資、外資法人、價值攸關性

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## 1 Introduction

This paper discusses the value relevance trend of earnings and equity book values through 1994-2007 in Taiwan stock market. Relationship between foreign institutional ownership and the extent of wielding accounting numbers in stock valuation is also studied. Value relevance research incepted from 1990s in the U.S. and as categorized by Holthausen and Watts (2001), these studies can be roughly grouped into:

- 1) Relative association studies;
- 2) Incremental association studies/ measurement studies;
- 3) Marginal information content studies.

This study examines whether foreign institutional (FI) holdings is a reference for investors in utilizing accounting numbers when valuing stocks. The level of foreign institutional ownership is added into the conventional valuation model as interaction variable with earnings per share (EPS) and book value per share (BVPS). Thus, partially speaking, this study can be categorized as an incremental association study.<sup>1</sup>

Graham and King (2000) examine the explanatory power of earnings and book values in stock valuation across six Asian countries—Indonesia, Korea, Malaysia, the Philippines, Taiwan and Thailand. They predict and find that the extent of conservatism

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<sup>1</sup> However, the focus of this paper is not on the incremental explanatory power of the specified model after adding FI; no comparison of  $R^2$  between models adding and not adding FI will be done in this paper. The argument of Holthausen and Watts (2001) about inferences from value relevance literature for standard setting is consequently not applicable here.



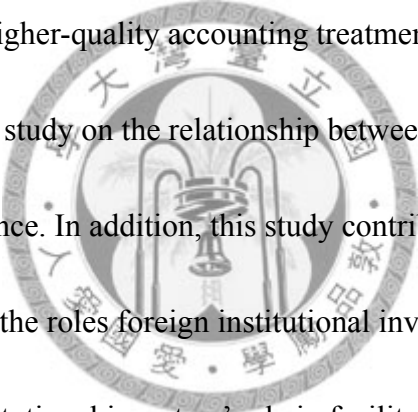
in accounting rules can have impact on value relevance. Taiwan was predicted to have lower incremental explanatory power of book value since Taiwan, at that time, didn't allow recognition of goodwill, revaluation of assets and the expensing of R&D was also restricted. These violated clean surplus relation and drove book value away from its true value; thus, the loss of explanatory power of book value in stock valuation is within expectation. Davis-Friday et al. (2006) study value relevance of accounting numbers from the degree of corporate governance and type of accounting rule (IAS-based or tax-based). Their target countries are Indonesia, Malaysia, South Korea and Thailand, the four hit most serious during Asian financial crisis. Their study suggests that corporate governance mechanism and accounting standards both have positive weights in the utilization of accounting numbers. In view of the evolvement of Taiwan's accounting standards after her participation in WTO from 2002, and the ongoing revision and gradual convergence with IFRS, this paper tries to examine value relevance change in earnings and book values especially in the recent decade.

As of the deregulation of foreign investment in Taiwan stock market in 2001, level of foreign ownership has climbed up steadily. Holdings proportion in Taiwan stock market of the three major types of institutional holders—foreign investors (FIs), security investment trust companies (SITCs) and security traders (SDs) is well recorded on a daily basis by Taiwan Stock Exchange (TWSE). Chiao and Lin (2004) document

that net buys and sells activities of the three major institutional investors do have information content. Investors forming portfolios according to net buys/ sells information can yield greater returns than the market. So as the level of foreign institutional ownership gets higher, there's a possibility that their investing behaviors will be relied on more by individual investors than before. In addition, holdings preferences of institutional investors are also well documented. Hessel and Norman (1992) firstly investigate the different financial characteristics between neglected and institutionally-held firms in the U.S. Kang and Stulz (1997) study the same topic in Japan stock market. Both studies indicate that holding preference of institutional investors is partially affected by accounting quality of the investees. Previous studies also indicate that lack of information of foreign firms and high information processing costs are among the major causes of home bias (Kang and Stulz [1997], Ahearne et al. [2004]). Bradshaw et al. (2004) even clearly states that, "As a primary source of information regarding the firm, the accounting system affects how outsiders perceive and use the firm's financial information." Thus, the growing number of foreign institutional investors might bring up the extent that financial statements being utilized and then consequently, the higher value relevance of accounting numbers. This is the second topic this study wants to look into.

In a recent article, Dhaliwal et al. (2005) evidence that level of institutional holdings

is an effective indicator with respect to the extent of utilizing financial statements in stock valuation. Triggered by Dhaliwal et al. and discussion above, this paper tries to investigate if consistent conclusions can be drawn in Taiwan stock market. Foreign institutional investors are chosen as the researched target because through the 14-year-period from 1994-2007, foreign institutional holdings have significant increase along with the gradual deregulation in foreign investment ceilings. Taiwan also experienced a series of accounting revolution that should be perceived as movements into more transparent and higher-quality accounting treatments.

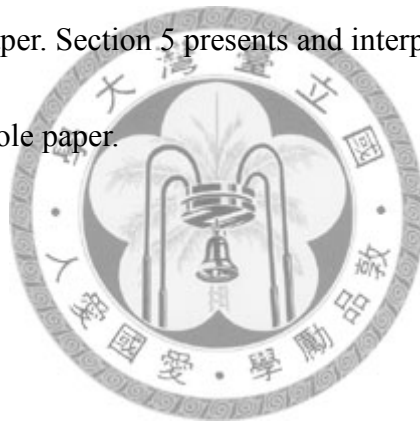


This paper is the first to study on the relationship between foreign institutional ownership and value relevance. In addition, this study contributes to extant literature by firstly empirically studying the roles foreign institutional investors play in their investees. Literature of institutional investors' role in facilitating corporate governance hasn't been documented in Taiwan but has been investigated much in the U.S. and found supporting evidence on this hypothesis (Dhaliwal et al., 2009). Even though stock market peculiarities in Taiwan are quite different from U.S., domestic investors' reliance on information released by foreign professional traders implies that how foreign institutions are perceived by investors is worth studying. This study aims to relate foreign institutional ownership with investors' utilization of financial statements.

As documented later in this study, trend of value relevance becomes more steady

and climbs up after 2001, especially from 2005 to 2007, a prominent phase of revolutionary accounting changes. Also, a positive relationship is found between foreign institutional holdings and weight of accounting numbers in stock price measurement. Lastly, empirical results further show that level of foreign institutional holdings is an indicator of both short-term and long-term financial health of a firm.

This paper will proceed as follows. Section 2 reviews extant relevant literature. Section 3 states the main research topics in this study. Section 4 specifies models and variables adopted in this paper. Section 5 presents and interprets empirical results and section 6 concludes the whole paper.



## 2 Literature Review

In recent two decades, many studies in the U.S. started looking into the trend of value relevance of financial statements; evidence provided was mixed. According to Francis and Schipper (1999), market value relevance refers to the statistical association between accounting-based variables with stock price or return. Collins et al. (1997) adopts earning-price relation and book value-price relation model to test value relevance in the U.S. stock market for an overall 40 years from 1953-1993. They find a shift of incremental explanatory power from earnings to equity book values and they attribute this finding to growing numbers of four phenomena: intangible assets-intensive companies, loss firms, recurring of one-time items, and small firms. A common explanation of the shift mentioned above is the industrial development from manufacturing to knowledge economy era. Intangible assets such as human capital, know-how and research and development have become more important tools for profitability while on the other hand, been neglected from earnings calculation fully or partially. The term “dirty surplus relation” is used to mean that the change in book value cannot be fully reflected in current earnings. Francis and Schipper (1999) examine this claim, with a sample period of 1952-1994 and find that the incremental explanatory power of earnings becomes less prominent through the period; contrarily, book values gain more weight in stock price valuation. However, they don't find significant

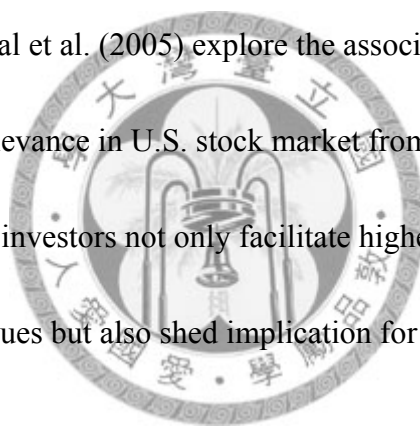
difference between high-technology and low-technology firms in book value explanatory power.

Brown et al. (2000) argue that scale effects mislead past studies to conclude that valuation weighting of book values was increasing (Collins et al., [1997]; Francis and Schipper, [1999]). Measurement by  $R^2$  is defective because once controlling value relevance, they find  $R^2$  fluctuate with coefficients of variation of the scale factor. Hence, inclusion of proxy for scale factors or scaling dependent and independent variables by scale factors has thus become a widely-accepted approach when conducting value-relevance research. For example, in Taiwan, studies investigating time-series change of value relevance has accumulated much faster in recent 10 years. Most papers examine time-series data from 1980s to 1999; for instance, Lee (2001) and Lin (2001); both studies find no obvious trend in total explanatory power during the researched period. However, after scaling dependent and independent variables with previous-year-end stock price or after adding proxy for scale factor into the model, as suggested by Brown et al. (2000), they find a steady decline of incremental explanatory power in earnings. Lin (2007) extends the period to a total of twenty years, from 1986-2005. He finds that value relevance is actually increasing even after scaling. There are also some studies produced by foreign researchers dedicated to value relevance among Asian countries (Graham and King, [2000]; Davis-Friday et al., [2006]).

Extending from Lin (2007), this study will focus on value relevance of listed stocks in Taiwan Stock Exchange (TWSE) from 1994-2007.

In addition, many studies extend focus from purely investigating relevance trend. Collins et al. (1999) document that the anomalous significant negative coefficients on earnings for loss firms shown in previous studies like Hayn (1995) and Jan and Ou (1995) was due to the neglect of book value in traditional earnings-price (return) model. Many studies in this area used models either based on earnings or book values but since Collins et al. (1999), market valuation model based on both earnings and book values have been used pervasively in this kind of studies. Inclusion both earnings and equity book values into the model is more consistent with what Ohlson (1995) proposes, which is that firm value is a function of book value and abnormal earnings. However, most studies substitute net income or earnings per share for abnormal earnings to avoid the uncertainties involved with abnormal earnings estimation (Easton and Harris, [1991]; Collins et al, [1997 & 1999]; Barth et al. [1998]). Barth et al. (1998) examine the value relevance change of companies 5 years preceding their bankruptcy. They partition full samples into profit and loss firms and find that for loss firms, equity book values have significantly higher incremental explanatory in valuing stocks. Other partitioning methods have been provided, for instance, bond rating model is developed and utilized by Barth et al. (1998) and Dhaliwal et al. (2005). Barth et al. divide pooled samples into

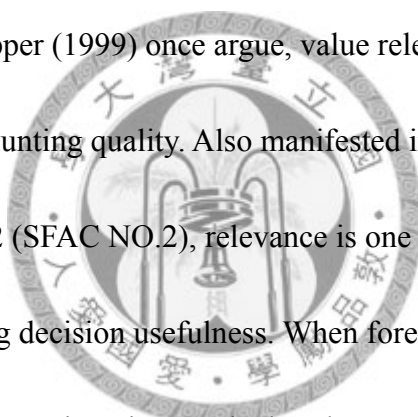
high and low financial healthy firms by actual or effective bond rating, and they find that coefficient on and incremental explanatory power of net income (book value) are lower (higher) for less financial healthy firms. Dhaliwal et al. (2005) use bond rating as a control variable for a firm's financial health. Besides, some other factors are under examination as possible reasons causing declining value relevance. Dontoh et al. (2004) suggest and evidence that non-information-based trading has certain degree of relationship with stock price, and so should be considered when conducting value relevance research. Dhaliwal et al. (2005) explore the association between institutional shareholdings and value relevance in U.S. stock market from 1989-1999, documenting that long-term institutional investors not only facilitate higher value relevance in earnings or equity book values but also shed implication for better corporate governance.



This study follows Dhaliwal et al. (2005) and tries to empirically study if foreign institutional investors has the same function as that documented in U.S. stock market. This study focuses on Taiwan stock market, a mid-developing financial market, which is relatively young in developed world but much more mature than other emerging markets. Only foreign institutional ownership but not domestic ones are taken into consideration here since foreign capital is one of the major sources of momentum in driving Taiwan stock market especially in recent years. As claimed by Aggarwal et al.



(2003), “foreign capital plays an important role in promoting economic growth in countries with developing financial systems.” They also document that fund holdings are affected by country-level and firm-level characteristics such as shareholder protection, accounting quality, GDP, law enforcement, etc. Especially in countries with weak investor protection laws, accounting quality becomes the major factor in asset allocation of U.S. mutual funds. Davis-Friday, Eng, and Liu (2006) also reach a similar conclusion by studying value relevance of four Asian countries during Asian financial crisis. As Francis and Schipper (1999) once argue, value relevance is one of the most important attributes of accounting quality. Also manifested in Statement of Financial Accounting Concepts No. 2 (SFAC NO.2), relevance is one of the primary qualitative characteristics in facilitating decision usefulness. When foreign investors become a more important type of investor in Taiwan, whether they are likely to bring up the overall value relevance in Taiwan companies’ reliability of financial statements is one of the main topics of this study.



### *Portfolio measure*

Another measure utilized in value relevance studies is portfolio measure (Alford et al., 1993). Francis and Schipper (1999) describe this measure as a better tool than regression models method in order to avoid the effect of market volatility. In this paper, portfolio measure is adopted as an auxiliary tool to examine yearly stock returns that

can be earned from forming investment portfolios according to accounting information such as earnings and change of earnings. In addition, firms are grouped into high and low level of foreign institutional ownership to examine the same topic again. This measure also aims to see if there's an increasing or decreasing trend of taking financial information into consideration when valuing stocks. Taiwan stock market is thought to be more volatile since market participants consist more than 80% of individual investors so portfolio measure is adopted here besides regression models.



### 3 Research Topics

This study tries to study three topics:

1. Trend of value relevance in Taiwan from 1994 to 2007;
2. Relationship between foreign institutional ownership and value relevance;
3. The roles foreign institutional investors play in their investees.

#### 3.1 *Trend of value relevance*

##### *Trend of value relevance in Taiwan*

Mixed evidence of the trend of value relevance in Taiwan has been provided. This might have been due to the different periods investigated. Lin (2007) investigates the period from 1986-2005, extending from Lin's (2001) 1981-1999 and Lee's (2001) 1986-1999. Lin (2007) runs a trend regression for the total explanatory power of the market valuation model and finds a positive slope coefficient. Thus, he concludes an increasing extent of value relevance in earnings and book values through 1986 to 2005. However, if investigating the yearly adjusted  $R^2$  of the market valuation model which is used mainly in these studies, no steady increase can be found. Interestingly, the average value of  $R^2$  was significantly increasing after 2001. This phenomenon might be attributed to the deregulation of foreign investors' holdings ceilings across industries (except for some special industries) and Taiwan's participation in World Trade Organization (WTO) in 2002.

### *Deregulation of foreign investment ceilings and WTO*

Deregulation of foreign investment limit is a policy in line with Taiwan's membership in WTO effective since 2002. Signatory members are required to abide by GATS (General Agreements on Trade in Services).<sup>2</sup> The main provision of GATS is to facilitate cross-border supply and consumption of services, and one of the services identified in CPC (Central Product Classification System),<sup>3</sup> numbered CPC 862, is "accounting, auditing and bookkeeping services". GATS Article VI:4 grants the WTO authority to develop disciplines on domestic regulation to ensure that licensing, qualification and technical standards are not more trade-restrictive than necessary. In light of a series of accounting scandals, WPPS (Working Party on Professional Services) was set up to dedicate to enforce GATS Article VI:4 firstly in accountancy sector. WPPS recognizes IFAC (International Federation of Accountants) and IASB (International Accounting Standards Board) as the international standard setters of international auditing and accounting rules. WPPS also suggests all member states to converge and harmonize with international auditing and accounting standards.

### *Accounting changes in Taiwan in recent years*

The formulator of Taiwan General Accepted Accounting Principles, the Accounting

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<sup>2</sup> GATS (General Agreement on Trade in Services) was drafted by WTO in 1994 and became effective in 1995 for all member states, seeking to facilitate liberalization of trades in services sector. GATS is seen as an extension of GATT (General Agreement on Tariffs and Trade) and works in the same way as that provided by GATT for merchandise goods.

<sup>3</sup> CPC (central product classification system) is the main classification used for products and services under the negotiation framework of WTO.

Research and Development Foundation, has declaimed the convergence plan with IFRS in 2007 and a probable full compliance with IFRS in 2013. In fact, since 1999, Taiwan has changed its traditional way of drafting accounting rules from U.S. GAAP-based to IAS/ IFRS-based. In recent decade, Taiwan has experienced a series of phenomenal changes in accounting treatments, for example, ROC GAAP No.25 “Entity Merger—The Purchase Method”, regulates that firms conducting merger activities after January 1, 1997, should recognize the value of the acquired firm in fair value and the difference between acquiring value and costs should be recognized as goodwill. Another example is the revision in 2001 of ROC GAAP No. 18 “Accounting for Pensions”, which was initially issued in 1991 and the revision was referred to IAS 19, IAS 26, and US GAAP No. 87. Some more recent examples are ROC GAAP No.34 about the fair value measurement of financial assets and No.36 about the disclosure of financial assets, both firstly implemented in 2006; in addition, the expensing of stock-based employee benefits is also incepted from 2008. The appropriateness of implementing the recently-revised No.10 and No.34 are also under discussion. These are all evidences that Taiwan gets closer to international recognized accounting treatments.

**Research Topic:**

Based on discussions above, this study tries to investigate the trend of value relevance in Taiwan stock market from 1994 to 2007 and investigates if value relevance

can be elevated or not by factors mentioned above. Though there are many other factors that can influence value relevance, this paper only tries to see if primitive accounting numbers such as earnings and book values have become more or less value relevant through these 14 years. If I can find apparent elevation after the deregulation of FI holdings ceilings or participation in WTO, these two factors can be interpreted as possible contributors to value relevance.

### ***3.2 Relationship between foreign institutional ownership and value relevance***

There is no literature ever indicating a relationship between institutional investors and value relevance until Dhaliwal et al. (2005), the first to relate these two distinct topics in capital market research. They find that in the U.S., investors are more likely to refer to accounting numbers of a firm with higher institutional holdings when making investment decisions. Also implied by Kuo (2002), she documents that in Taiwan, institutionally-held stocks are valued more faithfully with their operational performances. This is because investors expect that institutional investors can effectively facilitate corporate governance. In this study, however, I replace institutional investors with foreign institutional investors. The reason is that foreign institutional investors are among the three biggest categories of institutional investors in Taiwan and their holdings proportion keeps getting higher.

*Implications of foreign investors to Taiwan stock market*

As of the date this paper is written, Taiwan is still among the country list of MSCI (Morgan Stanley Capital International) Emerging Markets Index; foreign funds keep playing an important role in affecting Taiwan stock market. The ratio of total foreign capital to total capital (domestic + foreign) has been getting higher and higher through the 14-year period from 7.8% in 1994 to 11.05% in 2007.<sup>4</sup> If excluding financial service firms, foreign holdings also climb from 8.22% in 1994 to 10.67% in 2007.

Foreign capital inflow usually signals better political-economic environment, better accounting quality and optimistic future economic development, etc. of one country (Aggarwal et al. 1993). In 1991, Taiwan government firstly allowed QFII (Qualified Foreign Institutional Investor) to enter Taiwan stock market, but with an upper limit of 10% in total stock holdings for each investor. In 1993, GFII (General Foreign Institutional Investors) was allowed, broadening the type of foreign investors. Finally in 2001, shareholdings ceilings were deregulated both for QFII and GFII. This was a major policy in preparation of Taiwan's membership in WTO in 2002.

There are studies focusing on the effect liberalization of market might bring about to existing stock market. Kwan and Reyes (1997) study the stock return volatility before and after Taiwan's market liberalization in 1991. They find that after liberalization, stock market volatility decreases and stock prices reflect available information in the

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<sup>4</sup> This calculation is based on data from "ownership structure" in Company Profile of Taiwan Economic Journal (TEJ) databank.

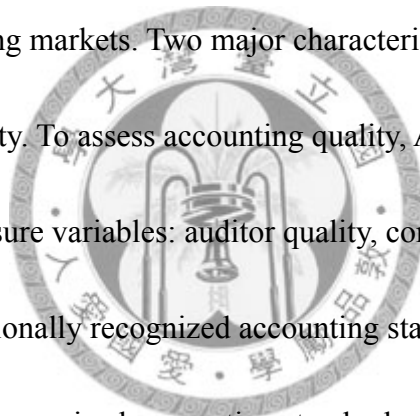
market more timely. Chiao and Lin (2004) indicate that the net buys and sells information of the three biggest categories of institutional investors (dealers, securities investment trust companies and foreign investors) in Taiwan have information content since individual investors can get higher rate of return if they follow the investment strategies of institutional investors. Kao (2004) finds that foreign investors in Taiwan make ex-ante prediction of annual earnings by referring to quarterly financial reports and related information, and adjust stockholdings allocation about 50 days (100 days) previous to the annual earnings announcement date with respect to positive (negative) earnings. However, individual investors need longer time to digest good and bad news about a firm's earnings prospects. Kao (2004) argues that foreign investors have better capability in retrieving and processing available information.

Taiwan stock market is composed mainly by individual investors. For instance, in 2008, according to ownership structure released by listed companies (financial industry excluded), domestic individual investors comprise an averagely 59.01% of total share holdings. In an individual-intensive stock market like Taiwan, the phenomenon documented by Chiao and Lin (2004) and Kao (2004) can be more prominent. Capital movements of foreign institutions are still perceived as an important indicator of economic outlooks and firm's financial health in near future.

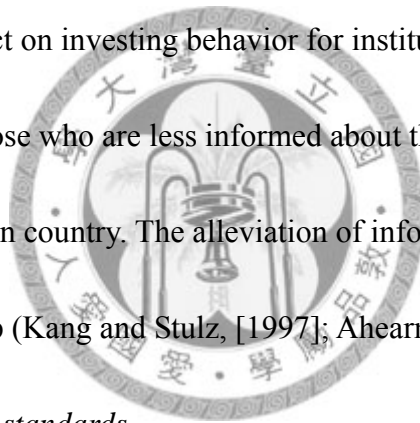
*Institutional holdings and accounting*



Hessel and Norman (1992) investigate stocks neglected and institutionally-held. They find that institutional investors have distinctive stock holdings preference which includes high profitability, high growth opportunities and long-term competitiveness. Bushee and Noe (2000) document the preference of institutional investors, no matter transient or quasi-indexer investors, to invest in companies with higher disclosure rankings. Aggarwal et al. (2003) present especially clear evidence by studying country-level and firm-level characteristics of U.S. actively-managed mutual funds' investing targets in emerging markets. Two major characteristics studied are shareholder rights and accounting quality. To assess accounting quality, Aggarwal et al. (2003) adopt four accounting and disclosure variables: auditor quality, consolidated reporting, auditor opinion and use of internationally recognized accounting standards. The attribute—internationally-recognized accounting standards—is defined as the adoption of U.S. GAAP or International Accounting Standards (IAS, now IFRS). Empirical results suggest that accounting quality can affect investment strategies of mutual fund managers. For example, they prefer to hold stocks or invest in countries with higher degree of accounting quality. This is consistent with the global investor survey conducted by McKinsey between April and May, 2002 (McKinsey & Co., 2002), based on responses from more than 200 institutional investors, aggregately managing some U.S.D 2 trillion of assets. The report finds that corporate governance and financial



disclosure are the two primary concerns in investment strategy. It also indicates that accounting disclosure is perceived by 71% of interviewees as the most important factor in affecting investment decisions. This survey actually conforms to what also be found in accounting literatures (Bradshaw, [2004]; Ahearne et al. [2004]) that U.S. investors prefer to invest in foreign firms with higher visibility, for instance, firms cross-listed in U.S. stock exchanges because these firms will issue financial statements in US GAAP and be under the regulations of SEC. These all imply a common point—accounting standards do have an impact on investing behavior for institutional and individual investors, especially for those who are less informed about the true picture of their investing targets in a foreign country. The alleviation of information costs should facilitate foreign ownership (Kang and Stulz, [1997]; Ahearne et al. [2004]).



#### *Home bias and accounting standards*

Disharmony in accounting treatments is seen as one of the major obstacles for trades in accounting services. As we can see in the practice rules of the so-called global CPA firms such as Deloitte & Touche and PriceWaterhouseCoopers, though global partnerships, the accounting and auditing treatments they apply and regulations they comply with both conform to where these companies situate. Ahearne et al. (2004) show that information asymmetry between local firms and foreign investors are more serious causes for home bias than capital controls or transaction costs. They find that home bias

can be reduced significantly from 0.8 to 0.5 if all foreign firms are cross-listed in U.S. stock market. That means differences in accounting principles and disclosure conventions across countries would generate costs borne by foreign investors who can only refer to a firm's published accounts information when evaluating the firm's financial prospect to decide the firm investable or not. When borne with these costs, investors would ask for higher required rate of return, and elevate cost of equity for those foreign firms. So if companies are willing to cross-list in US's stock exchanges, adopting US GAAP and being monitored by SEC, they can enhance their visibility in the eye of American investors, strengthening the reliability of their financial statements, and reducing home bias among American investors.



**Research Topic:**

As stated in Topic 1, Taiwan has approached to internationally-recognized accounting treatments gradually in recent years. This approach can alleviate information asymmetry for foreign investors and enhance their interests in investing in Taiwan stock market. Once foreign institutional investors enter the market, according to holdings preferences documented by previous literature, they prone to choose firms with better accounting quality. To decide how good the accounting quality of a firm is, foreign institutional investors would utilize financial statements when making investment decisions. Besides, if domestic individual investors do refer to foreign institutional

holdings, they might mimic institutional investors' investment choices or investment strategy, such as making use of accounting numbers when making investment decisions. In this way, institutional holdings can indirectly enhance value relevance of financial statements.

### ***Profit and loss firms***

Topics mentioned above have not yet involved in the division of profit and loss firms; however, several studies have done so in the past. Extant literature also document that positive and negative earnings bear different information content for investors. For instance, Hayn (1995) finds that in the earnings-price relation model, the coefficient on earning is significantly elevated after deleting loss firms from the full sample, which means that negative earnings can downward bias earnings response coefficient. In addition, her study also indicates that firm value can be measured by discounted future earnings flows or liquidation value if the firm yields earnings above (below) the “critical point” that can lead a firm to decide whether to keep operating or liquidate. Burgstahler and Dichev (1997), similarly, argue that better operating performance means that the firm utilizes present resources in a good way so the concern of the investors will lie in the efficiency of utilization, that is, earnings. On the other hand, firm performing worse has to rethink about the way it utilizes its resources so this kind of firm is more likely to face decisions such as replacing present assets or buying new

assets. In this circumstance, book value, which reflects the historical cost ( or fair value) of assets, will be weighted more in measuring firm value. Barth et al. (1998) discuss value relevance of earning and equity book value of firms 5 years previous to their bankruptcy. They find that incremental explanatory power of book value gets higher when firms get closer to year of bankruptcy. They further divide the full sample into high and low financial health according to the firm's bond rating. Empirical results suggest that earnings (equity book values) are weighted less (more) for firms with low financial health.

Combining what have been discussed, we can discover that in addition to the different information content positive and negative earnings bear, book values and earnings are also bestowed with different weights in stock valuation for profit and loss firms. This study also separates full sample into profit and loss firms, trying to see if in Taiwan stock market, similar findings can be detected.

### ***3.3 The roles foreign investors play in their investees***

#### *Fiduciary and governance role*

Shleifer and Vishny (1986, 1997) argue that institutional investors play two kinds of roles—fiduciary and governance roles. A fiduciary, or an agent, is a person who is asked to perform certain task by a principal. The agent has the responsibility to adhere to fiduciary duty of loyalty when taking out tasks. Examples like fund managers or

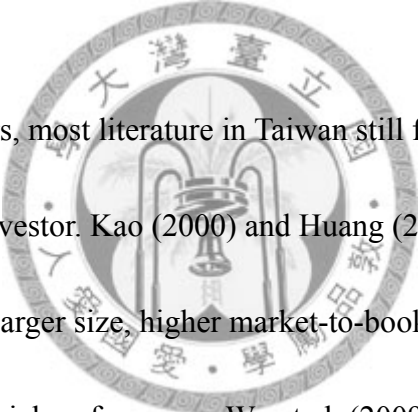
traders employed by institutions are both fiduciaries. To fulfill fiduciary roles, they tend to select firms with which they have deeper knowledge, followed by other institutional traders, covered more by analysts or with better financial performance.

Shleifer and Vishny (1997) conduct a survey about corporate governance and they classify concentrated ownership into three types: large shareholders, takeovers and large creditors. They point out that large shareholders, due to their high shareholdings, have motivation and are more capable to play governance roles in their investees, such as participate in or monitor the firm's managerial performance and personnel policy by utilizing voting power. As institutional investors become more prominent in U.S. stock market, their intention and extent of involvement in firm governance is worth investigating. Dhaliwal et al. (2005) are the first to empirically study whether in the eyes of the market, U.S. institutional investors play governance roles. They find that the market perceives institutional investors not only as an indicator of financial health but also a pusher of a firm's future operating performance.

#### *Institutional investors and corporate governance in Taiwan*

Extant literature in Taiwan documents a low degree of governance function by institutional investors. For example, "Report on Survey of Corporate Governance" released in 2003 by TCGA (Taiwan Corporate Governance Association) states that "Institutional investors in foreign securities market (i.e. U.S.) are mostly professional

and long-term investors who, by giving suggestions to the management, can help facilitate corporate governance. However, in Taiwan, institutional investors are confined to local investment environment and short-term investment fashion, so it is less likely for them to play long-term and voluminous roles.” This statement is consistent with Wu (2003). Wu finds that in Taiwan electronics industry, institutional investors are still weak in monitoring firm governance. Besides, cross-holdings among companies also weaken the effectiveness of institutional investors’ participation in corporate governance.

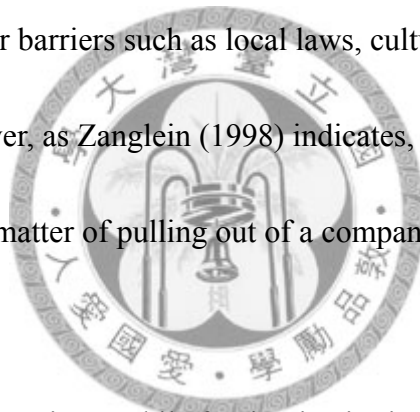


As for foreign investors, most literature in Taiwan still focuses on holdings preference of this type of investor. Kao (2000) and Huang (2001) indicate that foreign investors prefer firms with larger size, higher market-to-book ratio, lower P/E ratio and higher ROE, or better financial performance. Wu et al. (2009) document a positive relationship between corporate governance and foreign shareholdings. They find that foreign investors prefer firms with concentrated ownership by outside shareholders because large shareholders are better equipped with resources and motivations to take part in corporate policy making (Shleifer and Vishny, 1997).

**Research Topic:**

According to Wu et al. (2009), foreign investors take corporate governance into consideration when choosing investment target. But do these investors play governance

roles and dynamically facilitate corporate governance that can influence a firm's operation prospects? Many reasons can affect institutional investors' decision about being active or not in shareholder activism. For example, costs. Choi and Fisch (2008) conduct a survey on the shareholder activism of public pension funds in the U.S. and they find that pension funds only do a limited amount of non-litigation oriented activism due to high costs and layers of legal rules. It is not hard to imagine that the participation in the operation of a foreign firm can be more difficult, due to higher information processing costs and greater barriers such as local laws, culture, and different management styles. However, as Zanglein (1998) indicates, "Pursuing increased shareholder value is less a matter of pulling out of a company and more an exercise in working within."



This study wants to investigate while foreign institutional investors choose to be careful in becoming a shareholder, are they also attentive in being a shareholder?

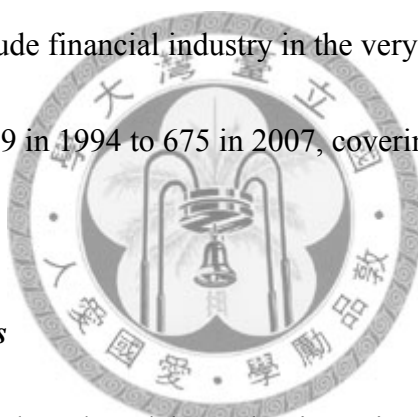
#### ***4 Models and Variable Measurement***

##### ***4.1 Sample selection***

Data consists of stocks listed on Taiwan Stock Exchange from 1994-2007, a total of 14 years. Yearly data are selected because audited financial statements are mandatory for listed firms and shareholder structure is released only once for a year. All data is



from Taiwan Economic Journal (TEJ) databank, a major financial economic database in Taiwan. Cross-sectional data comprises all existing listed companies of each year, and then I delete companies with unavailable data for the regression models. Different data is required for different models, resulting in different sample size for each model. Samples will be described more in the following section model by model. Financial service industry is neglected in this study because of its distinctive nature in the calculation of debt ratio and book value per share; so to maintain comparability of models in this paper, I exclude financial industry in the very first place. The number of company increases from 199 in 1994 to 675 in 2007, covering 14 years from 1994-2007.



## **4.2 Models and Variables**

Below specified methods and models used to investigate the research questions addressed in section 3. Some models are used to investigate more than 1 questions. Variables explanations are described in detail following every model specification.

### **4.2.1 Trend of value relevance**

To investigate trend of value relevance, two methods are utilized, first, the portfolio measure (Alford et al. [1993]; Francis and Schipper, [1999]); second, earnings-book value-price relation model (Barth et al. [1998]; Collins et al. [1999]);

Graham and King, [2000]; Dhaliwal et al. [2005]).

*a. Portfolio Measure*

Two portfolios are formed in this study, by sign of earnings (Sign\_earnings) and by magnitude of earnings ( $\Delta$ earnings) respectively. This method measures the proportion of perfect foresight returns-based returns<sup>5</sup> that can be earned by relying on accounting information such as earnings. If the proportion increases over time, it indicates that accounting information plays a more important role in valuing stock returns throughout the period studied and one might reason that value relevance is increasing. The steps to formulate these portfolios are described in the following: (Francis and Schipper, 1999)

1. Portfolio 1: Sign\_earnings

Portfolio based on direction of earnings change means that investors choose to invest according to a firm's earnings performance of the previous year. Based on the sign of change of earnings, this portfolio longs (shorts) firms with an increase (decrease) in current-period net income. The return of the portfolio can be expressed as:

$$R_{p1} = \frac{\sum R_I}{N_I} - \frac{\sum R_D}{N_D},$$

where:

$R_{p1}$           Return of portfolio 1

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<sup>5</sup> Perfect foresight returns-based hedge portfolio generates return that can be earned from holding portfolio fully referred to a stock's return of current year. This portfolio longs (shorts) stocks with positive (negative) returns in year t. For detailed description, please refer to "returns-based portfolio" in page 28.

$\sum R_I$	Sum of the 12-month accumulated returns <sup>6</sup> of firm with increasing net income
$\sum R_D$	Sum of the 12-month accumulated returns of firm with decreasing net income
$N_I (N_D)$	Number of firms with increasing (decreasing) net income

## 2. Portfolio 2: $\Delta$ earnings

Portfolio 2 differs from portfolio 1 in that it takes magnitude of earnings change into consideration. I rank firms by difference between current and previous period net income. The difference in earnings is scaled by beginning-of-period equity market value of the firm to control size effect. Following Francis and Schipper (1999), I take long in firms ranking in the highest 40% and short firms ranking in the lowest 40%. Return of this portfolio can be presented as:



$$R_{P2} = \frac{\sum R_H}{N_H} - \frac{\sum R_L}{N_L},$$

where:

$R_{P2}$	Return of portfolio 2
$\sum R_H$	Sum of the 12-month accumulated returns of firm in the highest 40%
$\sum R_L$	Sum of the 12-month accumulated returns of firm in the lowest 40%
$N_H (N_L)$	Number of firms in the highest (lowest) 40% of the ranking

### ***Perfect foresight returns-based portfolio***

In addition, a portfolio based on perfect foreknowledge of returns is established.

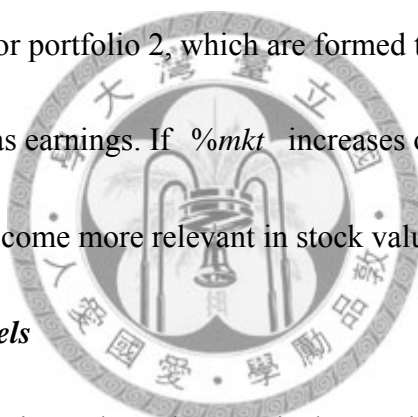
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<sup>6</sup> 12-month accumulated return is commencing from 5 months after close of fiscal year end in year t-1. Article 36 in the Taiwan Securities & Exchange Law states that listed firms should issue their certified financial reports within 4 months following the close of fiscal year end. For example, the return of year 2007 is calculated from May 2006 to April 2007.

This portfolio is formed by firstly ranking firms according to their 12-month accumulated returns commencing from the 5<sup>th</sup> month after close of fiscal year t-1; and then, I take long (short) in firms with positive (negative) returns. The return of this returns-based portfolio is  $R_M$ . I scale  $R_{P1}$  and  $R_{P2}$  by  $R_M$ , denoted as “%mkt”.

$$\%mkt = \frac{R_{P1}(R_{P2})}{R_M}$$

“%mkt” represents the proportion of returns of the returns-based portfolio that can be earned from portfolio 1 or portfolio 2, which are formed totally by referring to accounting measures such as earnings. If %mkt increases over time, one can reason that accounting numbers become more relevant in stock valuation.



**b. Market Valuation Models**

Another method for testing value relevance is the earnings -book value- price relation model, or pervasively called market valuation model. Model (1), (1.1) and (1.2) are run on yearly data in order to examine the yearly change of explanatory power of each model.

*Model (1):*  $P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \varepsilon_{it}$

*Model (1.1):*  $P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \varepsilon_{it}$

*Model (1.2):*  $P_{it} = \alpha_0 + \alpha_2 \cdot BVPS_{it} + \varepsilon_{it}$

P is the unadjusted stock price 5 months following end of fiscal year t-1 (end of

May). Previous literature in Taiwan document that there's no much statistical difference in selecting fiscal year-end price or that ending 1, 2, 3 or 4 months after fiscal year end (Huang, 1999). Here, the choice of stock price is in order to conform to the date when foreign institutional holdings are made public by companies during shareholders' annual meeting.<sup>7</sup> Earnings per share (EPS) is the bottom-line net income divided by non-adjusted weighted average shares (TEJ Code: T3990). Book value per share (BVPS) is the year-end equity book value (TEJ Code: T2000) divided by year-end outstanding common shares.

In model (1), as argued by Ball and Brown (1968), positive (negative) earning is good (bad) news of the firm that have information content for investors. I expect that higher earning signals higher stock price, so  $\alpha_1$  should be significantly positive. As for book value, Burgstahler and Dichev (1997) and Barth et al. (1998) document that book value plays a significant role in stock valuation, especially for firms with worse financial health. Collins et al. (1999) further evidence that inclusion of book value along with earnings into the stock valuation model enhances the explanatory power of the valuation model. Following this discussion, I also presume  $\alpha_2$  to be significantly

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<sup>7</sup> In article 36 of the Taiwan Securities & Exchange Law, it states that, "Within four months following the close of each fiscal year, an issuer under this Act shall announce to the public ... financial reports which have been duly audited and certified by a certified public accountant..." Besides, article 170 in the Company Law specifies that, "The regular meeting of shareholders ... shall be convened within six months after close of each fiscal year..." Consequently, annual shareholders' meetings are usually held in May or June. I suppose that foreign institutional holdings won't change much during the period from announcement of annual reports to the date of shareholders' assembly (usually less than 1 month). In addition, as the data extracted from Taiwan Economic Journal (TEJ) database shows, most of companies release their ownership structure every year around June. These can support my adoption of May-end stock price as dependent variable.

positive.

Model (1) is additionally decomposed into earnings-price (model 1.1) and book value-price relation models (model 1.2) in order to examine incremental explanatory power of earnings and equity book values separately. The decomposition method was developed by Theil (1971) and adopted by Easton and Harris (1991), Collins et al. (1999) and Lee (2001). The incremental explanatory power of earning (book value) can be calculated as the adjusted  $R^2$  of model (1) subtracts adjusted  $R^2$  of model 1.2 (1.1).

### ***Profit and loss firms***

$$\text{Model (2): } P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_3 \cdot EPS_{it} \cdot D_{it} + \alpha_4 \cdot BVPS_{it} \cdot D_{it} + \varepsilon_{it}$$

To see if profit and loss firms contain different implication for stock valuation, I separate full samples into profit and loss firms. Firms with negative EPS are classified as loss firms and delegated a dummy (D) of 1, otherwise, D= 0. The separation of firms into profit and loss ones was incepted by Barth et al. (1998) and followed by Dhaliwal et al. (2005) and Davis-Friday et al. (2006). Past studies in Taiwan show that for negative earnings firms, incremental explanatory power of book value per share (BVPS) is much higher than that of EPS (Lee, [2001]; Lin, [2001]). This is consistent with the results of Barth et al. (1998) and might conform to the argument of Hayn (1995) and Burgstahler and Dichev (1997). Hayn (1995) argues that there's no lasting losses of a firm since the firm can choose to liquidate when it cannot endure more losses; thus, the

information content of negative earnings would lose explanatory power or only play a limited role in stock valuation. Burgstahler and Dichev (1997) claim that investor perceives earnings as more important factor in stock valuation when firms utilize current assets in a good way; otherwise, equity book values are weighted heavier. Therefore, I expect the same phenomenon to exist in this study, and predict  $\alpha_4$  ( $\alpha_3$ ) to be significantly positive (negative).

#### ***4.2.2 Level of foreign institutional ownership and value relevance***

Foreign institutional ownership is added into the market valuation model to see if the market relies more on financial statements when valuing firms with higher foreign institutional ownership. This question is investigated by model (3).

*Model (3):*

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_5 \cdot FI_{it} + \alpha_6 \cdot FI_{it} \cdot EPS_{it} + \alpha_7 \cdot FI_{it} \cdot BVPS_{it} + \varepsilon_{it}.$$

Foreign investment (FI) is the combining holdings of foreign institutional investors, which include “foreign financial institutions”, “foreign institutional investors” and “foreign trusts”. All data are from “Shares structure” in TEJ Company Database.<sup>8</sup>

Companies release their ownership structure during annual shareholders’ meetings that are usually held around May, so May-end stock price is adopted.

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<sup>8</sup> I don’t adopt “aggregate foreign investment” released by Taiwan Stock Exchange in every fiscal year end due to that after September in 2003, Taiwan has abandoned QFII system; therefore, the aggregate number after 2003 will comprise institutional investors as well as individual investors. While this study simply focuses on foreign institutional ownership, use of aggregate number will pose difficulties in interpreting empirical results.

If foreign institutional holdings elevate value relevance,  $\alpha_6$  and  $\alpha_7$  will be significantly positive, which means that investors are more likely to make use of earning and book values of equity in stock valuation when foreign holdings increases.

### ***Profit and loss firms***

To investigate if level of foreign institutional holdings has different effects on valuation for profit and loss firms. A dummy variable for profit or loss firm is added.

*Model (4):*

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_3 \cdot EPS_{it} \cdot D_{it} + \alpha_4 \cdot BVPS_{it} \cdot D_{it} + \alpha_5 \cdot FI_{it} + \alpha_6 \cdot FI_{it} \cdot EPS_{it} + \alpha_7 \cdot FI_{it} \cdot BVPS_{it} + \alpha_8 \cdot FI_{it} \cdot EPS_{it} \cdot D_{it} + \alpha_9 \cdot FI_{it} \cdot BVPS_{it} \cdot D_{it} + \varepsilon_{it}$$

As explained in model (2), book value (earning) is weighted more (less) heavily for loss firms,  $\alpha_3$  ( $\alpha_4$ ) is expected to be significantly negative (positive). In the same token, if foreign institutional ownership acts as an indicator of firm value, investors should make use of earning (equity book value) in valuing profit (loss) firms that are with higher foreign holdings. Therefore,  $\alpha_6$  and  $\alpha_9$  ( $\alpha_7$  and  $\alpha_8$ ) would be positive (negative).

### ***Valuation effect of changes in foreign institutional ownership***

Following Dhaliwal et al. (2005), I further decompose the effects of foreign investments into constant and incremental.

*Model (5):*



$$\begin{aligned}
P_{it} = & \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_3 \cdot EPS_{it} \cdot D_{it} + \alpha_4 \cdot BVPS_{it} \cdot D_{it} + \alpha_5 \cdot LFI_{it} \\
& + \alpha_6 \cdot LFI_{it} \cdot EPS_{it} + \alpha_7 \cdot LFI_{it} \cdot BVPS_{it} + \alpha_8 \cdot LFI_{it} \cdot EPS_{it} \cdot D_{it} + \alpha_9 \cdot LFI_{it} \cdot BVPS_{it} \cdot D_{it} \\
& + \alpha_{10} \cdot INC_{it} + \alpha_{11} \cdot INC_{it} \cdot EPS_{it} + \alpha_{12} \cdot INC_{it} \cdot BVPS_{it} \\
& + \alpha_{13} \cdot INC_{it} \cdot EPS_{it} \cdot D_{it} + \alpha_{14} \cdot INC_{it} \cdot BVPS_{it} \cdot D_{it} + \varepsilon_{it}
\end{aligned}$$

Incremental effect (INC) is defined with the sign of  $FI_{it} - FI_{it-1}$ . If FI of this period is higher than FI of last period, then set INC= 1, otherwise, set INC= 0. FI in model (4) is replaced by LFI (foreign institutional ownership in the previous period) in this model, in order to enhance the effectiveness of explanation to the incremental level of foreign institutional ownership and its relationship with value relevance. If the change of level of foreign institutional holdings plays a similar role as foreign ownership in providing investors with signal of a firm's financial health,  $\alpha_{10}$  should be significantly positive. And the signs of  $\alpha_6, \alpha_7, \alpha_8$  and  $\alpha_9$  should conform to the findings of model (4). In the same token, earning (book value) is weighted more by investors when valuing profit (loss) firms with higher LFI or increase in FI, so  $\alpha_{11}$  and  $\alpha_{14}$  should be significantly positive. Oppositely,  $\alpha_{12}$  and  $\alpha_{13}$  should be significantly negative.

#### **4.2.3 The roles foreign investors play in their investees**

Finally, I discuss the roles financial institutions play in Taiwan stock market—if they simply play as more professional investors who particularly pick financial healthy firms or they further monitor and dynamically affect their investees' financial and

operational prospects.

Beaver (1966) investigates the ability of financial ratios in predicting firm failures. He argues that predictability is one of the premises in saying that financial statements are reliable. He finds that financial ratios—cash flow to total debt, net income to total assets and total debt to total assets have better predicting power in forecasting the failure of a firm. His study assures and justifies the prevalent use of financial ratios among users such as banks in deciding whether to loan to an entity or not. Beaver (1966)'s study can be interpreted as an implication of the extent of utilizing accounting information. Among different ratios Beaver adopts, two of the ratios are selected in this study—return on assets (ROA) and total liabilities to total assets (debt ratio, DR). Another variable added is return on equity (ROE). Barth et al. (1998) evidence that debt-based partitioning variable such as bond rating has incremental explanatory power beyond ROE. Burgstahler and Dichev (1997) indicate that financial analysts should take ROE into consideration when valuing stocks by financial ratios such P/B ratio and P/E ratio. P/B ratio is the extent stock price reflects book value; a firm with low ROE but a high P/B ratio is likely to be overvalued. In the same way, a firm with high ROE indicates that the current way in using assets is adequate, so the effectiveness of present utilization of assets—P/E ratio, becomes the major concern. High ROE and low P/E ratio implies an investment opportunity. Consequently, ROE, though not directly

implying financial health, is still a major reference in investment decisions. These three ratios usually act as proxies for financial health of an entity; hence, I add them separately into the original model which only contains foreign institutional ownership as control variable. Models are specified in the following:

*Model (6):*

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_3 \cdot EPS_{it} \cdot D_{it} + \alpha_4 \cdot BVPS_{it} \cdot D_{it} + \alpha_5 \cdot FI_{it} + \alpha_6 \cdot FI_{it} \cdot EPS_{it} + \alpha_7 \cdot FI_{it} \cdot BVPS_{it} + \alpha_8 \cdot FI_{it} \cdot EPS_{it} \cdot D_{it} + \alpha_9 \cdot FI_{it} \cdot BVPS_{it} \cdot D_{it} + \beta_0 \cdot ROA_{it} + \beta_1 \cdot ROA_{it} \cdot EPS_{it} + \beta_2 \cdot ROA_{it} \cdot BVPS_{it} + \varepsilon_{it}$$

*Model (7):*

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_3 \cdot EPS_{it} \cdot D_{it} + \alpha_4 \cdot BVPS_{it} \cdot D_{it} + \alpha_5 \cdot FI_{it} + \alpha_6 \cdot FI_{it} \cdot EPS_{it} + \alpha_7 \cdot FI_{it} \cdot BVPS_{it} + \alpha_8 \cdot FI_{it} \cdot EPS_{it} \cdot D_{it} + \alpha_9 \cdot FI_{it} \cdot BVPS_{it} \cdot D_{it} + \gamma_0 \cdot ROE_{it} + \gamma_1 \cdot ROE_{it} \cdot EPS_{it} + \gamma_2 \cdot ROE_{it} \cdot BVPS_{it} + \varepsilon_{it}$$

*Model (8):*

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_3 \cdot EPS_{it} \cdot D_{it} + \alpha_4 \cdot BVPS_{it} \cdot D_{it} + \alpha_5 \cdot FI_{it} + \alpha_6 \cdot FI_{it} \cdot EPS_{it} + \alpha_7 \cdot FI_{it} \cdot BVPS_{it} + \alpha_8 \cdot FI_{it} \cdot EPS_{it} \cdot D_{it} + \alpha_9 \cdot FI_{it} \cdot BVPS_{it} \cdot D_{it} + \lambda_0 \cdot DR_{it} + \lambda_1 \cdot DR_{it} \cdot EPS_{it} + \lambda_2 \cdot DR_{it} \cdot BVPS_{it} + \varepsilon_{it}$$

From model (6) to model (8), I adopt three ratios as proxies for a firm's current financial health, they are returns on assets (ROA, TEJ code: TR 101), returns on equity (ROE, TEJ code: TR104) and debt ratio (DR, TEJ code: TR505). Following the argument in Dhaliwal et al. (2005), I observe the change in coefficients  $\alpha_6$ ,  $\alpha_7$ ,  $\alpha_8$  and  $\alpha_9$ . If Taiwan's foreign institutional investors have not yet played active roles in corporate governance, I expect to see  $\alpha_6$ ,  $\alpha_7$ ,  $\alpha_8$  and  $\alpha_9$  become less significant or even in the wrong direction after adding indicator of financial health into the model. This means

that the market views foreign institutional holdings as merely a financial health indicator but not that strong as financial ratios that are prevalently used as ROA, ROE and DR. Contrarily, if  $\alpha_6$ ,  $\alpha_7$ ,  $\alpha_8$  and  $\alpha_9$  keep significant in the right direction, it means that foreign institutional investors might have a presence in corporate governance.

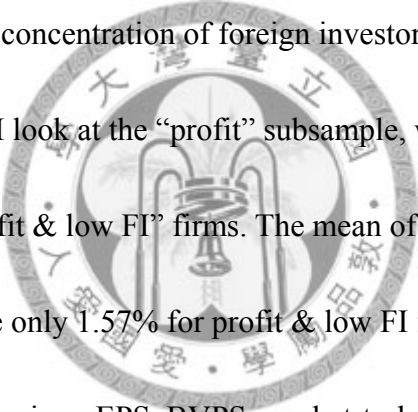


## 5. Empirical Results

### 5.1 Descriptive statistics

The full sample is further divided into four subsamples. Firstly, firms are ranked by foreign institutional ownership (FI). If a firm's FI is above yearly average FI, then the firm is categorized as "high FI"; otherwise, "low FI". Secondly, inside high and low ownership samples, firms are further divided by their signs of earning. If a firm's earning per share is above or equal zero, then the firm is categorized as "profit firms"; otherwise, "loss firms". Therefore, four subsamples are formed—"high and profit", "high and loss", "low and profit" and "low and loss". Variables listed in Table 1 will be scattered into 8 models under empirical tests, so there's no need to delete observations with missing values in only a few of variables. I select FI as the choosing criterion—as long as the data of foreign institutional ownership is available provided by TEJ for an observation, this observation is retained in Table 1. Consequently, I get 1,737 (190) observations for profit (loss) firms in the high FI group and 4,009 (1,037) observations for profit (loss) firms in the low FI group. This discrepant number of allocation is due to the concentration of foreign institutional investors in firms with a few of certain characteristics and specific industries. Table 2 summarizes the industry distribution across high and low foreign ownership. Industry allocation for high FI group is additionally pictured in Graph 1. Graph 1 shows an increasingly concentration of

foreign institutional holdings in electronics industry. To the date this paper is written, 49.64% of companies (financial industry excluded) listed on Taiwan stock exchange belongs to electronics industry (TSE industry code from M2324 to M2331). This titled industrial structure stems from Taiwan's policy since 1960s which emphasizes on the development of electronics industry. Nowadays, Taiwan has had several firms with global reputation in EMS (Electronic Manufacturing Services). These firms are usually larger in size and integrated into the supply chain of foreign prestigious brands. Thus, it is no doubt that we find the concentration of foreign investors in electronics industry.



In Table 1, first of all, I look at the “profit” subsample, which is composed by “profit & high FI” and “profit & low FI” firms. The mean of level of FI is 20.90% for profit & high FI firms while only 1.57% for profit & low FI firms. Besides, firms with higher FI have higher stock prices, EPS, BVPS, market-to-book ratio (MB), market value (MV), and R&D expenses. The mean (median) level of stock price for “profit and high FI” firms is 53.78 (36.55), while that for “profit & low FI” firms is 30.49 (22.40). As of EPS, the mean and median levels for profit & high FI firms are 3.27 and 2.40 but only 2.07 and 1.43 for low FI firms. ROA and ROE ratios are also much higher for high FI firms; the mean/median level of ROA (ROE) for high FI firms is 10.90/ 9.25 (15.03/ 13.30) but 8.00/ 6.57 (11.30/ 9.20) for low FI firms. This implies that high FI firms are more financial healthy or reversely speaking, foreign institutional investors prefer

financial healthy firms. In addition, R&D expenses and MB ratio are also higher for high FI firms, showing that foreign institutional investors prefer companies with greater growth potentials. Debt ratio is slightly lower for high FI firms, with a mean/ median level of 35.66%/ 36.06% with respect to 38.47%/ 37.82% for low FI firms. Higher market value implies larger firm size.

Secondly, I look at the “loss” subsample which is composed by “loss and high FI” and “loss and low FI” firms. Differences between these two subgroups are not that significant as the difference between profit firms with high FI and low FI. Similar findings are: even in the loss subsample, firms with higher FI also have larger size, higher book value, higher MB ratio and higher R&D expenses. That is, the holding preferences for foreign institutions are mostly the same. The mean level of FI for loss firms is 17.11% in high FI group, and 1.05% in low FI group. What interesting is that high FI firms seem to have larger losses than firms with low FI. For example, the mean/ median level of EPS (ROA) for high FI firms is -1.72/ -1.00 (-6.30/ -3.50) but -1.65/ -1.00 (-5.99/ -3.51) for low FI firm

The other way of grouping is also worth discussing. Panel A shows firms within high FI group. I find that profit firms are greater in size, stock price, market-to-book ratio, and foreign institutional ownership. The mean level of FI (MB) is 20.90% (2.56) for profit firms and 17.11% (1.42) for loss firms. R&D expenses for profit firms are

lower than that of loss firms (145636.39 vs. 163026.63) but the difference between profit and loss firms in R&D is much smaller than the difference between high and low FI groups. This further supports that growth opportunity is a criterion for foreign institutional investors in selecting investing targets. Panel B shows profit and loss firms within low FI group and the results are similar to that of Panel A. T-test of the differences between firms with high and low FI holdings (Table 3) shows that the differences of these twelve variables between high and low FI subsamples are significant.

#### ***Profit and loss firms***

Table 4 shows the correlation coefficients among key variables for profit and loss firms. The point worth noting is the relationship between EPS and price and BVPS and price. For profit firms, EPS and BVPS are both highly associated with stock price. However, for loss firms, correlation between EPS and price is very low and in the contrary, BVPS is much higher related with stock price. I expect to find different weighting in EPS and BVPS respectively between profit and loss firms.





**Table 1: Descriptive Statistics****Panel A: High Institutional Ownership**

Profit Firms				Loss Firms			
variables	N	Mean	Median	variables	N	Mean	Median
Price	1714	53.78	36.55	Price	190	16.51	12.15
EPS	1737	3.27	2.40	EPS	189	-1.72	-1.00
BVPS	1710	19.76	17.85	BVPS	189	12.17	11.84
ROA	1737	10.90	9.25	ROA	188	-6.33	-3.50
ROE	1737	15.03	13.30	ROE	188	-20.25	-7.74
MV(million)	1692	50731.31	13797.50	MV(million)	189	18804.88	5310.00
BV(million)	1737	21.97	6.20	BV(million)	189	13.35	4.41
NI (thousand)	1737	3276.97	794.56	NI (thousand)	189	-1442.90	-450.48
MB	1692	2.56	2.04	MB	187	1.42	0.99
RD	1549	145636.39	23871.00	RD	164	163026.63	23601.50
DR (%)	1737	35.66	36.06	DR (%)	189	45.26	45.44
FI (%)	1737	20.90	16.97	FI (%)	190	17.11	13.05
LFI (%)	1562	18.56	15.17	LFI (%)	183	14.75	12.18

**Panel B: Low Institutional Ownership**

Profit Firms				Loss Firms			
variables	N	Mean	Median	variables	N	Mean	Median
Price	3616	30.49	22.40	Price	993	10.90	8.00
EPS	4009	2.07	1.43	EPS	1025	-1.65	-0.99
BVPS	3504	15.90	14.62	BVPS	987	10.03	10.23
ROA	4002	8.00	6.57	ROA	1019	-5.99	-3.50
ROE	4002	11.30	9.20	ROE	1018	-15.85	-8.78
MV(million)	3479	8126.25	3869.00	MV(million)	989	4054.78	1778.00
BV(million)	4009	4.83	2.29	BV(million)	1028	4.01	2.19
NI (thousand)	4009	513.47	188.99	NI (thousand)	1025	-566.07	-215.69
MB	3478	1.75	1.41	MB	987	0.97	0.73
RD	3239	23750.60	5684.00	RD	876	25515.04	367.50
DR (%)	4009	38.47	37.82	DR (%)	1028	49.48	49.00
FI (%)	4009	1.57	0.50	FI (%)	1037	1.05	0.12
LFI (%)	3284	2.03	0.52	LFI (%)	980	1.31	0.11

- MB: market-to book ratio; RD: research and development expenses; DR(%): debt ratio; FI(%): foreign institutional ownership; LFI(%): foreign institutional ownership of last period
- Price is stock price 5 months following the close of fiscal year t-1.
- LFI is foreign institutional ownership (FI) of the pervious year
- All numbers are denominated in New Taiwan Dollar (NTD).

**Table 2: Industry distribution**

Industry distribution within high and low FI groups. This table shows a concentrated ownership of foreign institutional investors in a certain of sectors.

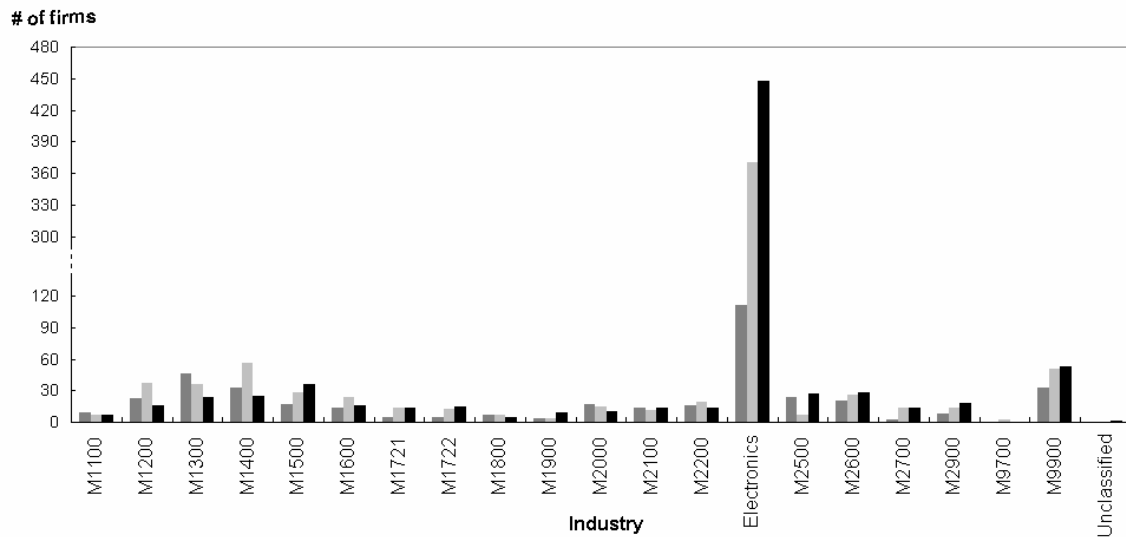
Year		2007		2006		2005		2004		2003		2002		2001		2000		1999		1998		1997		1996		1995		1994	
Industry code		H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L
M1100	Cement	2	5	2	5	2	5	1	6	2	5	1	6	2	5	1	6	1	6	1	6	2	5	3	3	2	5	1	6
M1200	Foods	4	16	4	16	3	16	5	15	6	14	8	12	7	13	8	12	8	12	5	11	3	13	6	9	5	10	3	10
M1300	Plastics	6	15	6	15	6	15	6	15	8	13	8	13	7	14	7	13	6	15	5	11	9	9	10	8	11	6	11	4
M1400	Textiles	5	41	8	38	6	40	6	40	6	40	25	39	11	35	8	37	6	39	7	35	6	28	9	28	6	28	5	24
M1500	Electric & Machinery	8	28	10	25	10	25	8	27	9	26	8	26	4	29	4	22	3	20	4	17	3	13	4	11	3	6	3	6
M1600	Elec. Appliance Cab	4	8	4	8	4	8	4	8	4	8	5	7	5	7	5	7	5	7	3	6	3	6	3	5	2	4	2	4
M1721	Chemical	4	19	5	18	3	20	2	20	2	20	4	18	3	18	3	16	2	16	2	12	1	17	1	12	1	11	0	12
M1722	Biotech & Medical	3	10	4	9	4	9	4	9	4	9	4	9	3	9	1	7	0	6	1	4	1	4	1	5	2	2	0	3
M1800	Glass & Ceramics	2	3	1	4	1	4	0	5	0	5	5	5	1	4	0	5	1	4	1	4	1	3	1	4	2	3	2	3
M1900	Pulp/ Paper	1	6	2	5	3	4	3	4	1	6	0	6	1	6	0	7	1	6	1	5	1	6	0	7	0	7	1	5
M2000	Iron & Steel	3	24	2	25	3	23	2	23	4	22	2	22	3	23	3	22	3	22	3	18	3	18	5	14	3	15	3	11
M2100	Rubber	3	6	3	6	4	5	3	6	2	7	2	7	3	6	2	7	2	6	2	7	2	7	2	6	4	4	3	4
M2200	Automobile	3	2	4	1	3	2	3	2	3	2	4	0	4	0	4	0	4	0	4	0	4	0	3	0	3	0	2	0
M2324	Semiconductor	20	37	24	27	24	26	20	27	23	24	21	24	20	19	13	18	11	13	9	10	6	9	5	9	6	4	4	6
M2325	Computer & Peripheral	26	30	28	18	24	31	26	26	24	30	21	32	16	33	13	28	11	25	8	22	5	15	9	9	4	7	2	3
M2326	Optoelectronic	18	36	16	35	17	27	16	27	16	26	12	29	11	27	5	18	7	6	2	14	0	7	1	6	0	6	1	3
M2327	Comm. & Internet	11	22	13	21	13	20	13	19	12	21	10	18	7	19	2	15	5	6	3	6	3	5	3	3	2	3	3	1
M2328	Elec. Parts & Comp.	13	54	14	52	12	52	11	54	12	53	8	54	12	47	5	32	5	22	3	17	4	15	3	13	2	8	2	6
M2329	Elec. Products Distribution	8	16	7	17	8	15	7	14	6	16	4	15	4	15	3	7	1	11	1	6	1	7	1	3	1	3	0	1
M2330	Information Service	3	7	3	7	2	8	2	8	2	7	0	9	1	7	1	5	0	0	0	5	0	3	0	2	0	1	0	0
M2331	Other Electronic	17	18	13	22	10	23	9	23	10	21	10	19	11	18	8	12	7	8	5	8	3	6	4	5	4	3	1	3
M2500	Building Material	12	25	10	27	3	34	2	34	2	35	0	37	1	36	2	31	2	31	4	24	11	14	5	19	2	22	1	19
M2600	Shipping & Trans.	8	10	7	10	7	10	6	11	6	11	6	11	5	12	5	10	4	10	3	9	5	9	5	8	4	9	3	8
M2700	Tourism	3	3	3	3	4	2	3	3	3	3	4	2	3	3	2	4	2	4	1	5	1	5	0	5	0	5	0	5
M2900	Trading & Cons.	6	4	4	6	4	6	4	6	4	6	3	7	3	7	2	8	1	9	1	8	2	8	3	6	2	6	0	7
M9700	Gas & Electricity	0	8	0	8	0	8	0	8	1	7	1	7	0	7	0	6	0	7	0	4	0	5	0	4	0	3	0	3
M9900	Others	14	22	11	24	13	22	15	20	14	21	10	25	9	26	9	21	9	19	9	16	8	13	5	12	6	13	5	12
	Unclassified	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

a. Industry code is retrieved from the classification standard of Taiwan Stock Exchange; data are extracted from "TEJ Company" in TEJ database.

b. H: high FI group; L: low FI group

c. "Unclassified" denotes the number of firms without available data for this sector.

**Graph 1: Industry distribution for high FI group**



**Industry code:**

M1100: cement  
M1200: foods  
M1300: plastics  
M1400: textiles  
M1500: electric & machinery  
M1600: electronic appliances & cables  
M1721: chemical  
M1722: biotech and medical  
M1800: glass and ceramics  
M1900: papers  
M2000: iron & steel  
M2100: rubber  
M2200: automobile



**Electronics (M2324~2331)**  
M2324: semiconductors  
M2325: computer & peripheral  
M2326: optoelectronic  
M2327: communication & internet  
M2328: electric parts & components  
M2329: electronic products distribution  
M2330: information service  
M2331: other electronic

M2500: building material  
M2600: shipping & transportation  
M2700: tourism  
M2900: trading & consumers  
M9700: gas & electricity  
M9900: Others

**Table 3: T-test for the mean difference between high/ low FI group**

T-test is run for firms within high and low FI groups in order to see if the means for these twelve variables are significantly different. SAS program shows that the variances of these twelve variables are all unequal, which means that these two samples are not homogenous, so Satterthwaite method is used in t-test. The results of Satterthwaite method are shown below; p-values are all below 0.0001, indicating that the difference in price (or any other variables) is significantly different between high and low FI group of firms.

Variable	DF	T value	Pr >  t
Price	2259	15.68	<.0001
EPS	2973	14.96	<.0001
BVPS	2641	20.32	<.0001
ROA	3300	16.56	<.0001
ROE	2644	8.82	<.0001
MV(million)	1957	13.75	<.0001
BV	2064	15.42	<.0001
NI	2036	12.96	<.0001
MB	2535	17.87	<.0001
RD	1784	12.93	<.0001
DR	4186	-10.18	<.0001
FI	1962	61.32	<.0001

Price: the stock price ending 5 months after the close of fiscal year end t-1; MB: market-to-book ratio; RD: research and development expenses; DR: debt ratio; FI: foreign institutional holdings

**Table 4: Pearson (Spearman) correlation**

This table shows the correlation coefficients among key variables in market valuation model.

variables	Profit Firms				variables	Loss Firms			
	Price	EPS	BVPS	FI		Price	EPS	BVPS	FI
<b>price</b>	1.0000	0.7990	0.6688	0.2815	<b>Price</b>	1.0000	0.0310	0.4781	0.1671
<b>EPS</b>	0.7538	1.0000	0.7635	0.3049	<b>EPS</b>	0.1100	1.0000	0.2734	-0.0676
<b>BVPS</b>	0.6827	0.6924	1.0000	0.3167	<b>BVPS</b>	0.5731	0.3381	1.0000	0.1006
<b>FI</b>	0.3614	0.3347	0.3546	1.0000	<b>FI</b>	0.3326	-0.0082	0.2650	1.0000

- Price is stock price ending 5 months after close of fiscal year t-1; EPS: earning per share; BVPS: book value per share; FI: foreign institutional holdings
- Pearson (Spearman) correlation coefficients are listed in the upper-right (lower-left) part of the table
- All correlation coefficients are significant at 99% confidence level.

## 5.2 Trend of value relevance

### a. Portfolio measure

Shown in Table 5 are the yearly returns and  $\%mkt$  (the proportion of returns of the perfect foresight returns-based portfolio that can be earned from portfolio 1 or portfolio 2). Portfolio 1 (Sign\_earnings) holds (sells) stocks with positive (negative) change in earnings. Portfolio 2 ( $\Delta$ earnings), longs (shorts) stocks ranking in the highest (lowest) 40% of earnings change. Table 5 shows that averagely, one can earn 35.98  $\%mkt$  by relying on sign of earnings change and 43.53% by referring to both the magnitude and direction of earnings change. Graph 2 presents the “ $\%mkt$ ” from 1994-2007, and shows that great volatility exists especially around 1994 to 2000. However, after 2000, “ $\%mkt$ ” keeps steadily increasing and reaches a high of 60.51% (71.50%) for portfolio 1 (portfolio 2) in 2005. In view of this trend and the steady increase, whether positive relationship does exist between foreign institutional ownership and value relevance is worth investigating because deregulation of foreign institutional holdings took effective since 2001. Moreover, the line graph shows that the proportion of information reflected in security returns that can be captured by accounting-based measures is higher for portfolio 2 through all 14 years except in 2001. This implies that firms with much higher increase in earnings have higher accumulated returns and firms with much bigger decrease in earnings yield relatively lower return.

However, accounting number (i.e. earnings) is only one of numerous elements contained in information set in the market so the increase in  $\%mkt$  shows that certain accounting numbers (as in this case, earnings) gain a higher weight in stock price measurement. To further test this trend, I run trend regressions on  $\%mkt$  for portfolio 1 and 2 as by Francis and Schipper (1999). Table 6 shows the results.

Raw and rank regressions are run respectively. Time is set as “1” for year 1994, “2” for year 1995 ... and “14” for 2007. Raw regressions are run with original yearly  $\%mkt$  data of portfolio 1 and 2. Rank regressions are run by data after ranking. I firstly rank year 1994-2007 from number 1 to 14. And then, I rank  $\%mkt$  by its magnitude, ranking the lowest  $\%mkt$  as 1 and the highest  $\%mkt$  as 14. Then I regress 1, 2, 3, ..., 14 which represents “time” on its corresponding ranking of  $\%mkt$ . According to Francis and Schipper (1999), rank regression can avoid the influence of outliers, as stated by them, “The rank regression approach has particular advantage in capturing a nonlinear decline in value relevance which might be confined to only one subperiod of our sample period...” Positive slope coefficients on “time” under raw and rank regressions indicate that the overall trend of  $\%mkt$  is increasing, though not significant.

From Graph 2 and Table 6, a preliminary conclusion might be reached. Overall speaking, value relevance from 1994 to 2007 is increasing. From the line graph, the

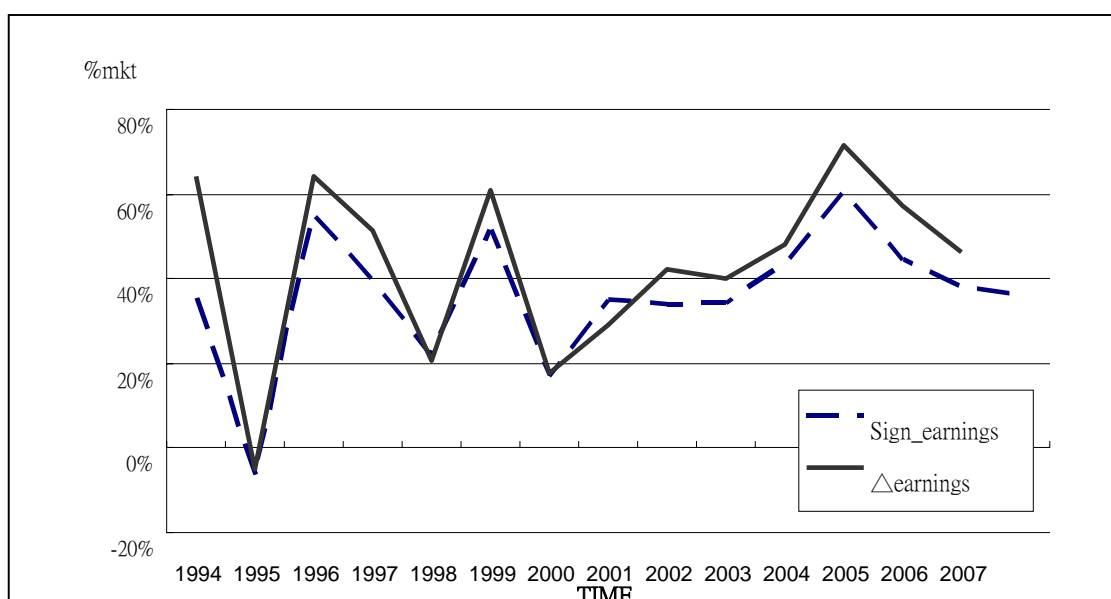
increasing trend is steady and obvious from 2000 to 2005 but starts to decline from 2005 to 2007. Further examinations about trend of value relevance are done in the following section.

**Table 5: Yearly %mkt for accounting-based portfolios**

Year	N	Portfolio 1: Sign earnings		Portfolio 2: △earnings	
		%	%mkt	%	%mkt
1994	189	16.83	35.43	30.59	64.40
1995	211	-2.27	-6.80	-1.65	-4.94
1996	245	37.93	55.48	43.88	64.18
1997	280	24.39	39.87	31.40	51.33
1998	312	11.23	21.70	10.67	20.61
1999	358	71.15	51.44	84.34	60.97
2000	421	10.81	17.18	11.18	17.76
2001	474	21.33	34.85	17.91	29.26
2002	518	26.46	33.97	33.06	42.44
2003	581	28.58	34.20	33.63	40.24
2004	611	22.64	43.57	24.99	48.09
2005	622	42.51	60.51	50.23	71.50
2006	641	32.76	44.33	42.33	57.28
2007	651	22.13	38.04	26.90	46.24
Average		67.17	35.98	31.39	43.53

- Column denoted by “%” is the return on accounting-based portfolio 1 and 2.
- “%mkt” is the proportion of return on “perfect foresight returns-based portfolio” that can be earned by holding portfolios according to accounting measures (i.e. earnings).

**Graph 2: Trend of %mkt for accounting-based portfolios**



**Table 6: Trend regression of %mkt for accounting-based portfolios**

$$R_{it} = \lambda_0 + \lambda_1 \cdot time + \varepsilon_{it}$$

Portfolios	Raw Regressions		Rank Regressions	
	$\lambda_0$	$\lambda_1$	$\lambda_0$	$\lambda_1$
<b>1. Sign_earnings</b>	0.2452 (2.65)**	0.0153 (1.40)	5.3736 (2.28)**	0.2835 (1.02)
<b>2. <math>\Delta</math>earnings</b>	0.3453 (2.82)**	0.0120 (0.83)	7.4270 (2.96)**	0.0102 (0.97)

a. "time" is set as 1 for 1994, 2 for 1995, 3 for 1996....and 14 for 2007.

b. \*\* is significant under 95% confidence level

### b. Market Valuation Models

Table 7 presents yearly regression results of model (1), (1.1) and (1.2) over the sample period 1994-2007. After deleting firms without available data in earnings per share and book value per share, I get 6,588 firm-year observations. Incremental explanatory power of earnings and that of equity book value are at the most right of the table. To compute these two numbers, I follow the  $R^2$  decomposition technique described in Collins et al. (1997), which was developed by Theil in 1971. The coefficient of determination for model (1), (1.1) and (1.2) are denoted as  $\bar{R}_T^2$ ,  $\bar{R}_{1.1}^2$ , and  $\bar{R}_{1.2}^2$  respectively. Incremental explanatory power of earnings (Incr EARN),  $\bar{R}_{EPS}^2$ , equals  $\bar{R}_T^2 - \bar{R}_{1.2}^2$ ; incremental explanatory power of book value (Incr BVPS),  $\bar{R}_{BVPS}^2$ , equals  $\bar{R}_T^2 - \bar{R}_{1.1}^2$ .

Some findings in Table 7 are as follows. First, number of firms increase gradually from 199 in 1994 to 675 in 2007. Second,  $\alpha_1$  and  $\alpha_2$  are both significantly positive, no



matter run by yearly data or the full sample, hence supporting the notion that earning and book value both play significant roles in stock valuation. Trend regression is run for  $\bar{R}_T^2$  in model (1), in order to see if trend of value relevance change similar to that found under portfolio measure can be observed. The result is tabulated in Table 8. Slope coefficient on “time” is significantly positive under raw regression ( $\lambda_1=0.016$ ,  $t=2.35$ ), indicating that overall, total explanatory power of the market valuation model ( $\bar{R}_T^2$ ) is increasing. Graph 3 illustrates  $\bar{R}_T^2$  year by year.



**Table 7: Yearly regression results for model (1), (1.1) and (1.2)**

		Market valuation model (1)				Earnings-price model (1.1)			Book value-price model (1.2)			Incr EARN	Incr BVPS
		$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \varepsilon_{it}$				$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \varepsilon_{it}$			$P_{it} = \alpha_0 + \alpha_2 \cdot BVPS_{it} + \varepsilon_{it}$			$\bar{R}_{EPS}^2$	$\bar{R}_{BVPS}^2$
time	N	$\alpha_0$	$\alpha_1$	$\alpha_2$	$\bar{R}_T^2$	$\alpha_0$	$\alpha_1$	$\bar{R}_{1.1}^2$	$\alpha_0$	$\alpha_2$	$\bar{R}_{1.2}^2$	$\bar{R}_{EPS}^2$	$\bar{R}_{BVPS}^2$
1994	199	7.8273 (1.75)*	6.3774 (9.25)***	1.3775 (4.60)***	0.5087	27.3415 (17.95)***	8.0281 (12.98)***	0.4584	-4.7490 (-0.93)	2.8171 (9.22)***	0.2979	21.08%	5.03%
1995	231	10.4480 (3.25)***	1.1917 (2.82)***	1.2573 (5.81)***	0.3113	28.4159 (29.97)***	2.7612 (7.95)***	0.2129	5.9295 (2.09)**	1.6480 (9.75)***	0.2904	2.09%	9.84%
1996	275	11.4107 (1.67)*	10.2527 (12.41)***	1.4838 (3.08)***	0.6585	31.8739 (19.34)***	12.1953 (22.47)***	0.6479	-44.980 (-7.05)***	6.0396 (15.53)***	0.4671	19.14%	1.06%
1997	305	-8.2268 (-1.38)	17.1884 (16.45)***	1.6085 (3.91)***	0.7284	13.8185 (7.09)***	20.1743 (27.68)***	0.7157	-62.5033 (-9.17)***	6.5638 (17.01)***	0.4867	24.17%	1.27%
1998	350	-7.6109 (-1.21)	8.6872 (9.90)***	3.2263 (5.60)***	0.4774	26.2365 (14.36)***	11.7271 (16.32)***	0.4319	-39.7596 (-6.52)***	4.8742 (13.20)***	0.3318	14.56%	4.55%
1999	416	-16.0362 (-2.35)**	11.0055 (9.58)***	3.0926 (6.46)***	0.4782	25.8837 (11.43)***	15.9148 (17.61)***	0.4268	-50.3697 (-7.84)***	6.1210 (15.44)***	0.3639	11.06%	4.47%
2000	473	9.8040 (2.76)***	11.5707 (17.94)***	0.0472 (0.18)	0.6001	10.4127 (8.29)***	11.6576 (26.68)***	0.6009	-26.6921 (-7.08)***	3.4427 (15.20)***	0.3278	27.23%	-0.08%
2001	517	4.8592 (1.67)*	10.5949 (20.34)***	0.9217 (4.52)***	0.6466	17.1938 (16.59)***	12.1141 (29.87)***	0.6333	-25.4668 (-7.59)***	3.5951 (17.20)***	0.3635	28.31%	1.33%
2002	595	0.8965 (0.47)	6.2409 (19.48)***	0.9672 (6.73)***	0.7117	13.1945 (21.07)***	7.8770 (36.39)***	0.6901	-22.7955 (-11.95)***	3.0897 (25.78)***	0.5277	18.40%	2.16%
2003	620	8.9321 (6.67)***	9.7318 (30.35)***	0.1928 (2.25)**	0.6896	11.3054 (13.63)***	10.1108 (36.92)***	0.6876	3.7009 (1.77)*	1.5569 (13.54)***	0.2275	46.21%	0.20%
2004	632	8.5960 (6.43)***	7.3253 (25.24)***	0.1827 (2.24)***	0.5963	10.8609 (12.40)***	7.6512 (30.38)***	0.5937	5.7624 (3.05)***	1.2163 (12.15)***	0.1886	40.77%	0.26%
2005	647	-3.0619 (-0.68)	13.2890 (16.77)***	0.8666 (2.58)**	0.6159	7.7756 (4.50)***	14.9465 (31.97)***	0.6125	-51.9943 (-12.52)***	5.4181 (22.97)***	0.4491	16.68%	0.34%
2006	653	0.6053 (0.19)	9.2279 (17.80)***	1.1606 (5.14)***	0.6841	15.7798 (11.37)***	11.3823 (36.54)***	0.6717	-35.1383 (-11.29)***	4.4050 (27.18)***	0.5308	15.33%	1.24%
2007	675	-1.7714 (-0.66)	10.5048 (21.30)***	0.7212 (3.98)***	0.7154	7.5169 (5.52)***	12.0774 (40.55)***	0.7091	-32.1212 (-10.85)***	3.8186 (27.25)***	0.5239	19.15%	0.63%
<b>FULL</b>	<b>6588</b>	5.2435 (5.67)***	9.8387 (58.45)***	0.7897 (12.42)***	0.5707	15.5454 (37.69)***	11.2833 (91.71)***	0.5608	-20.0105 (-19.87)***	3.3593 (59.32)***	0.3481	<b>22.26%</b>	<b>0.99%</b>

- a. \*, \*\*, \*\*\* denotes significance under 90%, 95%, 99% confidence level  
b. T statistics are shown in the parentheses below every coefficient.  
c.  $\text{Incr EARN}(\bar{R}_{EPS}^2) = \bar{R}_T^2 - \bar{R}_{1.2}^2$ ;  $\text{Incr BVPS}(\bar{R}_{BVPS}^2) = \bar{R}_T^2 - \bar{R}_{1.1}^2$

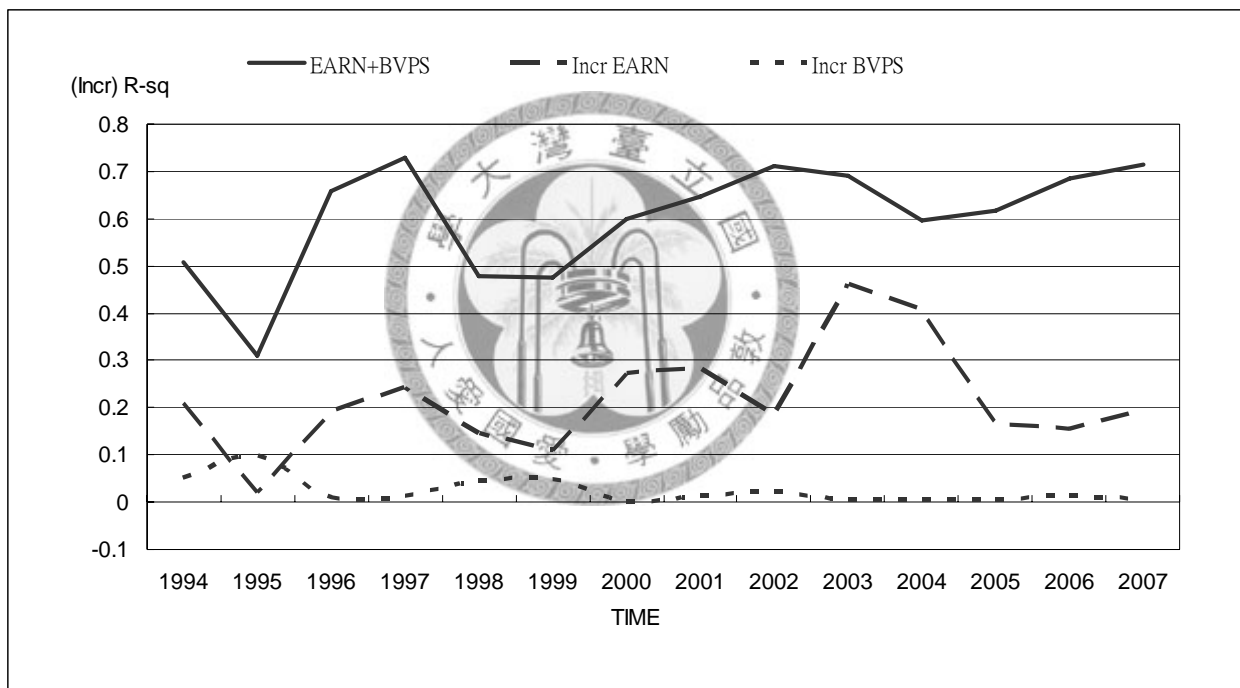
**Table 8: Trend regression on  $\overline{R_T}^2$  for market valuation model (1)**

$$R_{it} = \lambda_0 + \lambda_1 \cdot time + \varepsilon_{it}$$

	Raw Regression	Rank Regression
$\lambda_0$	0.4810 (8.28)***	4.0879 (1.87)*
$\lambda_1$	0.0160 (2.35)**	0.4550 (1.77)

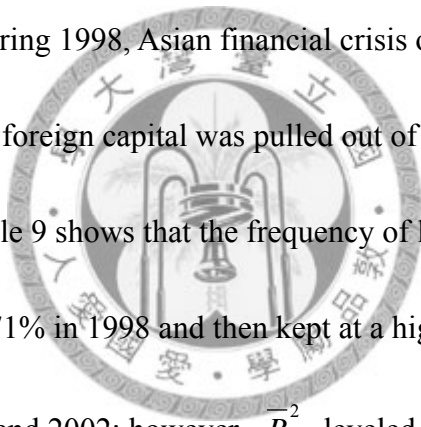
- a. "time" is set as 1 for 1994, 2 for 1995, 3 for 1996....and 14 for 2007.  
 b. \*\*, \*\*\* denotes significance under 95% and 99% confidence level

**Graph 3: Line graph for  $\overline{R_T}^2$ , incremental explanatory power of EARN and BVPS**



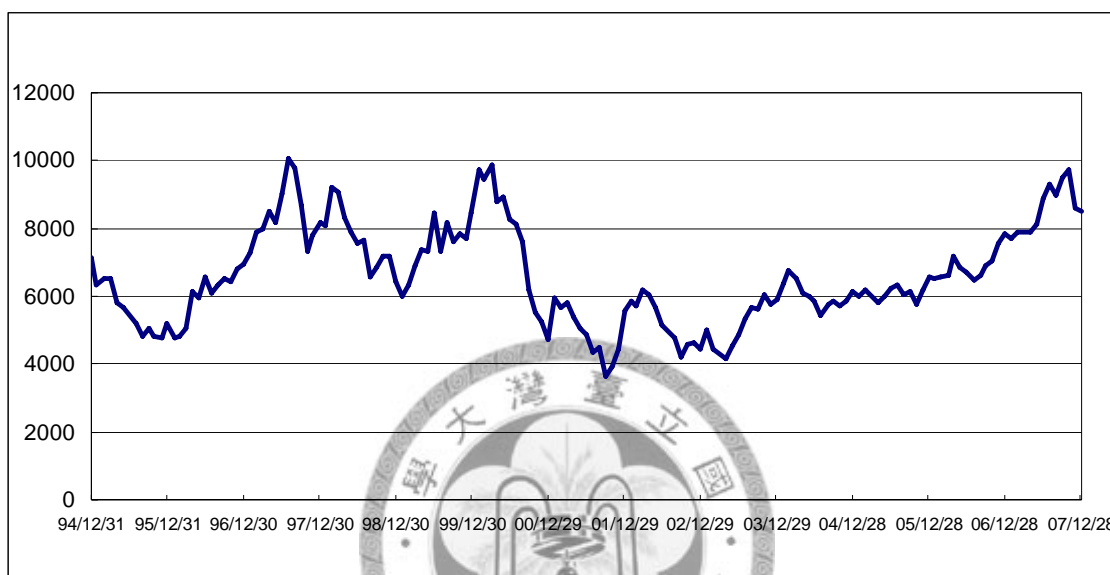
Some similarities can be found in Graph 2 and Graph 3. From 1994-1998, the trend of value relevance was very similar under portfolio measures and market valuation model—a dip in 1995, followed by a bounce in 1996 and 1997 and another dip in 1998. In 1995 and 1996, Taiwan experienced substantial political instability from China’s military threats which resulted in a big slump in stock market, as shown by the steep

decline in 1995 in Graph 4 (The graph illustrates the performance of Taiwan stock market from 1994 to 2007). Political concerns weighted much heavier than ever in stock valuation. This was the major reason why accounting numbers lost more relevance during that period. And in 1995, incremental explanatory power of equity book value exceeded that of earnings, as shown in Table 7 ( $\bar{R}_{BVPS}^2 = 9.84\%$ ;  $\bar{R}_{EPS}^2 = 2.09\%$ ). Besides,  $\bar{R}_{BVPS}^2$  again climbed up in 1998 and kept at a high level during 1998 and 1999 while  $\bar{R}_{EPS}^2$  for those two years were decreasing. Total explanatory power ( $\bar{R}_T^2$ ) was also low around those two years. During 1998, Asian financial crisis overshadowed the whole Asian financial market and foreign capital was pulled out of Asian stock markets on a big scale. Furthermore, Table 9 shows that the frequency of loss firms also climbed from 7.87% in 1997 to 23.71% in 1998 and then kept at a high level of 23.04%, 29.59% and 21.18% in 2000, 2001 and 2002; however,  $\bar{R}_T^2$  leveled up from 2000 to 2002. Why the level of value relevance ( $\bar{R}_T^2$ ) could be so different when stock market in these two periods both performed badly? This study supposes that the cause of decline in stock market can drive investors' perception about the reliability of financial statements. The slump in 1998 was due to speculation activities of foreign arbitragers and Asia's over reliance on foreign debt and export industry. Big foreign funds, who are usually market movers, ignore the fundamentals of a company when investing, misleading other investors to perceive the prosperous stock performance as true economic outlook of a



company. The large-scale withdrawal of foreign capital not only brought down stock prices, but also led to the market's disappointment about the reliability of financial statements.

**Graph 4: TAIEX performance from 1994 to 2007**



**Table 9: Frequency of loss and profit firms**

	Loss firms		Profit firms	
	# of firms	frequency	# of firms	frequency
1994	13	6.53%	186	93.47%
1995	30	12.99%	201	87.01%
1996	30	10.91%	245	89.09%
1997	24	7.87%	281	92.13%
1998	83	23.71%	267	76.29%
1999	85	20.43%	331	79.57%
2000	109	23.04%	364	76.96%
2001	153	29.59%	364	70.41%
2002	126	21.18%	469	78.82%
2003	98	15.81%	522	84.19%
2004	114	18.04%	518	81.96%
2005	138	21.33%	509	78.67%
2006	109	16.69%	544	83.31%
2007	79	11.70%	596	88.30%

a. Firm is classified as profit (loss) firms if  $EPS \geq 0 (< 0)$ .

On the other hand, the startling slump in 2000 was incepted from the break of the notorious dot.com bubble in the U.S. These internet companies attracted capital by boasting the increasing use of internet and growing business opportunities the worldwide web brings about. After establishment, these companies usually undergo net losses through couple of years. When the FED elevated interest rate by 6 folds at the beginning of March in 2000, the market started to realize that the so-called beautiful future of internet business was doubtful. Big sells of internet companies caused several internet firms to bankruptcy. Inevitably, Taiwan stock market was affected by this global downturn and because Taiwan had electronics industry as the main composer of listed companies, the impact was especially serious. Nevertheless, this time, financial statements didn't lose its relevance in stock valuation; contrarily,  $\bar{R}_T^2$  increased from 0.6001 to 0.7117 from 2000 to 2002, and earnings became much highly weighted than equity book values in this period. The possible reason might be that during times of depression, investors care more about the "real thing" they hold in hand, that is, cash or dividend. A firm that can distribute more cash during depression (i.e., firms with higher earnings) would be preferred by investors. Consequently, earnings were seen as a more important indicator when valuing stocks.

Interestingly, from 2005 to 2007 in Graph 3,  $\bar{R}_T^2$  keeps climbing up and the explanatory power of earnings and equity book values are getting closer. This is

contrary to the movement in Graph 2 under portfolio measure. A possible explanation might have been provided by Collins et al. (1999); they propose that inclusion of book value into market valuation model can enhance the total explanatory power of the model. In addition, Graph 3 shows that incremental explanatory power of EPS declines from 2005 to 2007, suggesting that the trend illustrated in Graph 2 is due to the lost of value relevance of earnings in these 3 years. Entirely speaking, as shown in Table 8, trend regression indicates that value relevance is increasing across these 14 years; and as shown in Graph 2 (portfolio measure) and Graph 3 (market valuation models), degree of value relevance fluctuates more seriously in 1994-2000 than that after 2000.

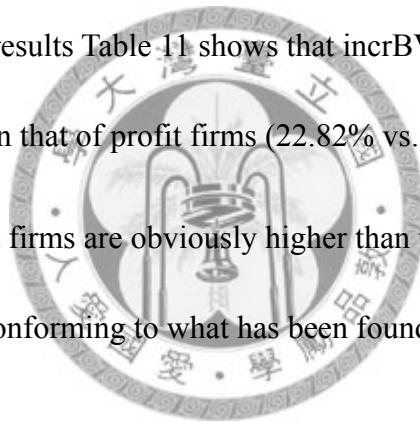
### ***Profit and loss firms***

One of the research emphases in this paper is to study the different implication in stock valuation between profit and loss firms. Thus, the full sample is partitioned by sign of earnings per share into firms with earnings higher than or equal to zero and firms with earnings less than zero (Dhaliwal et al., 2005). Table 10 shows the regression result of model (2):

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_3 \cdot EPS_{it} \cdot D_{it} + \alpha_4 \cdot BVPS_{it} \cdot D_{it} + \varepsilon_{it}$$

Model (2) examines valuation weighting of EPS and BVPS for profit and loss firms. D is a dummy set as 1 for loss firms (firms with  $EPS < 0$ ). As predicted,  $\alpha_4$  ( $\alpha_3$ ) is significantly positive (negative), indicating that for loss firms, book values (earnings)

gain more (less) explanatory power in stock valuation. According to Hayn (1995), the scarce information content of negative earnings might be due to its transitory attribute and the liquidation right held by stockholders to prevent endless losses. In addition, as argued by Burgstahler and Dichev (1997) and Barth et al. (1998), book values gain higher value relevance for loss firms or firms with lower financial health. To see the different incremental explanatory power of EPS and BVPS of profit and loss firms, I run the earnings-price and book value-price relation model separately for these two groups of companies. The results Table 11 shows that  $\text{incrBVPS} (\bar{R}_{BVPS}^2)$  of loss firms are substantially higher than that of profit firms (22.82% vs. 0.82%). Conversely,  $\text{IncrEARN} (\bar{R}_{EPS}^2)$  of profit firms are obviously higher than that of loss firms (30.61% vs. 1.02%). This result is conforming to what has been found in extant literature.





**Table 10: Regression result for model (2)**

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_3 \cdot EPS_{it} \cdot D_{it} + \alpha_4 \cdot BVPS_{it} \cdot D_{it} + \varepsilon_{it}$$

This model is used to detect the different valuation weighting of earnings and equity book values between profit and loss firms.

Variable	Coefficient	Predicted Sign	Estimate
Intercept	$\alpha_0$	+/-	0.6387 (0.75)
EPS	$\alpha_1$	+	13.1692 (73.11)***
BVPS	$\alpha_2$	+	0.4284 (7.27)***
EPS · D	$\alpha_3$	-	-13.5520 (-31.78)***
BVPS · D	$\alpha_4$	+	0.63027 (7.24)***
Adj-R <sup>2</sup>			0.6438
N			6588

a. D is set to 1 if EPS is less than 0; otherwise, D=0.

b. \*\*\* denotes significance under 99% confidence level

**Table 11: Regression results for profit/ loss firms**

Group	N	Market valuation model (1) $P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \varepsilon_{it}$				Earnings-price model (1.1) $P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \varepsilon_{it}$			Book value-price model (1.2) $P_{it} = \alpha_0 + \alpha_2 \cdot BVPS_{it} + \varepsilon_{it}$			Incr EARN $\bar{R}_{EPS}^2$	Incr BVPS $\bar{R}_{BVPS}^2$
		$\alpha_0$	$\alpha_1$	$\alpha_2$	$\bar{R}_T^2$	$\alpha_0$	$\alpha_1$	$\bar{R}_{1.1}^2$	$\alpha_0$	$\alpha_2$	$\bar{R}_{1.2}^2$		
<b>PROFIT</b>	5397	1.10942 (1.11)	13.19939 (66.71)***	0.40121 (5.93)***	0.6289	6.19519 (11.91)***	13.98786 (95.15)***	0.6265	-20.6023 (-16.09)***	3.43345 (50.73)***	0.3228	30.61%	0.24%
<b>LOSS</b>	1191	-2.40128 (-2.76)***	-0.70008 (-4.10)***	1.27094 (18.78)***	0.2282	12.25178 (28.03)***	0.18358 (0.98)	0.0000	-0.50972 (-0.69)	1.19642 (18.24)***	0.2180	1.02%	22.82%
<b>FULL</b>	6588	5.24352 (5.67)***	9.83869 (58.45)***	0.78965 (12.42)***	0.5707	15.54547 (37.69)***	11.28333 (91.71)***	0.5608	-20.0105 (-19.87)***	3.35929 (59.32)***	0.3481	22.26%	0.99%

a. An observation is categorized as “profit” if it has  $EPS \geq 0$ ; an observation is classified as “loss” if it has  $EPS < 0$ .

b.  $IncrEARN = \bar{R}_T^2 - \bar{R}_{1.2}^2$ ;  $IncrBVPS = \bar{R}_T^2 - \bar{R}_{1.1}^2$

### ***5.3 Foreign institutional ownership and value relevance***

This topic is also tested by two methods—portfolio measure and market valuation models. The full sample is divided into two groups—high and low foreign institutional holdings to see if different valuation weighting of earning and equity book values exist between these two groups. On the other hand, foreign institutional ownership is added into market valuation model to see if the level of foreign holdings can affect investor's utilization of accounting measures in valuing stock price.

#### ***a. Portfolio measure***

Portfolio measure is also adopted here to test trend of value relevance between groups with high and low foreign institutional holdings (FI). Firms with FI level higher than yearly average are classified into high FI group; otherwise, low FI group. Two portfolios, based on sign of earnings (portfolio 1) and magnitude of earnings (portfolio 2) respectively, are formed for each group. This study compares the proportion of return of the perfect foresight returns-based portfolio that can be captured by sign and magnitude of earnings ( $\%mkt$ ) within these two groups. The results are tabulated as Table 12, which shows that firms with higher foreign institutional holdings averagely capture higher proportion of perfect knowledge by relying on earnings information. In Graph 5 and 6, " $\%mkt$ " of portfolio 1 and 2 for high and low FI group are further pictured and some interesting phenomenon can be observed. For example, after 2002,

high FI group keeps earning higher  $\%mkt$  than low FI group and the trend also becomes steadier higher for both groups. The steadier tendencies in value relevance trend might be explained by Kwan and Reye (1997)'s argument that foreign investors can help stabilize market volatility and enhance market efficiency.

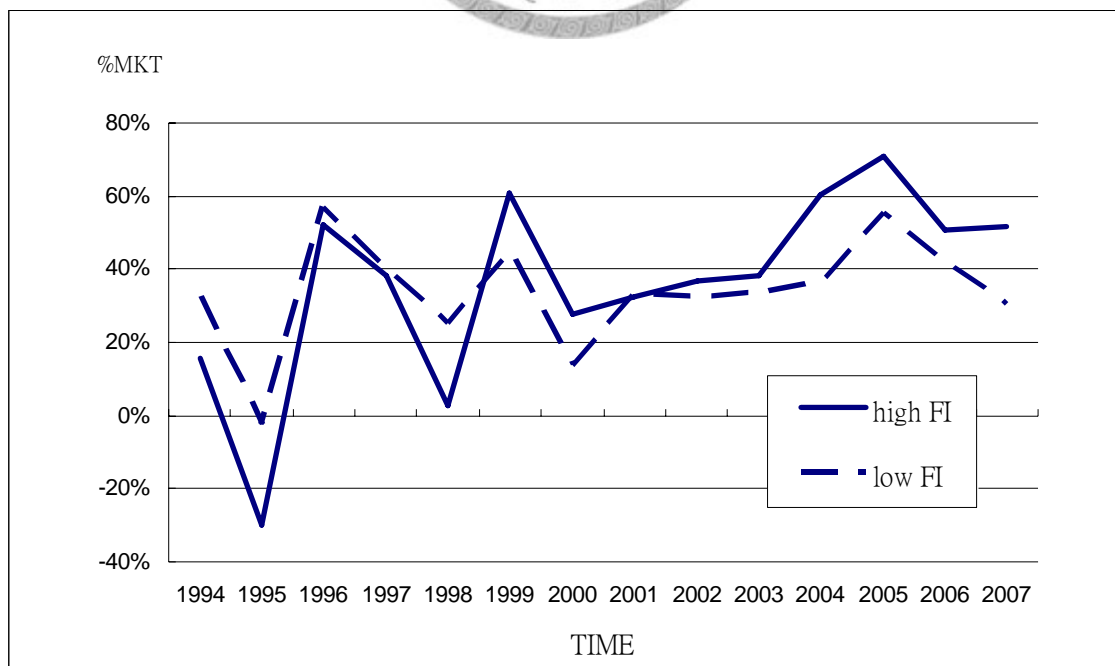
However, prior to 2000,  $\%mkt$  of high FI group is much more volatile than low FI group; in 1995 and 1998,  $\%mkt$  of high FI group were even lower than that of low FI group. During those two years, Taiwan stock market was experiencing high fluctuations due to political instability and Asian financial crisis. In last section, this study just document that financial statements lost most of its relevance in 1995 and 1998 (Graph 3), along with the synchronic slump of incremental explanatory power of earnings. Under portfolio measure, earning is the only criterion in portfolio formation, but when earning loses its explanatory power, other information is supposed to replace earning as a more powerful factor in influencing stock price. While high FI firms are mostly bigger firms covered more by media and analysts, much more public information other than earnings are more likely to affect investors' perception of a firm and consequently, lead to changes in stock price. Therefore, no significant differences in value relevance between high and low foreign institutional holdings group can be determined by portfolio measure stated here unless other portfolio forming methods are also examined.

**Table 12: Yearly %mkt for accounting-based portfolios for high/ low groups**

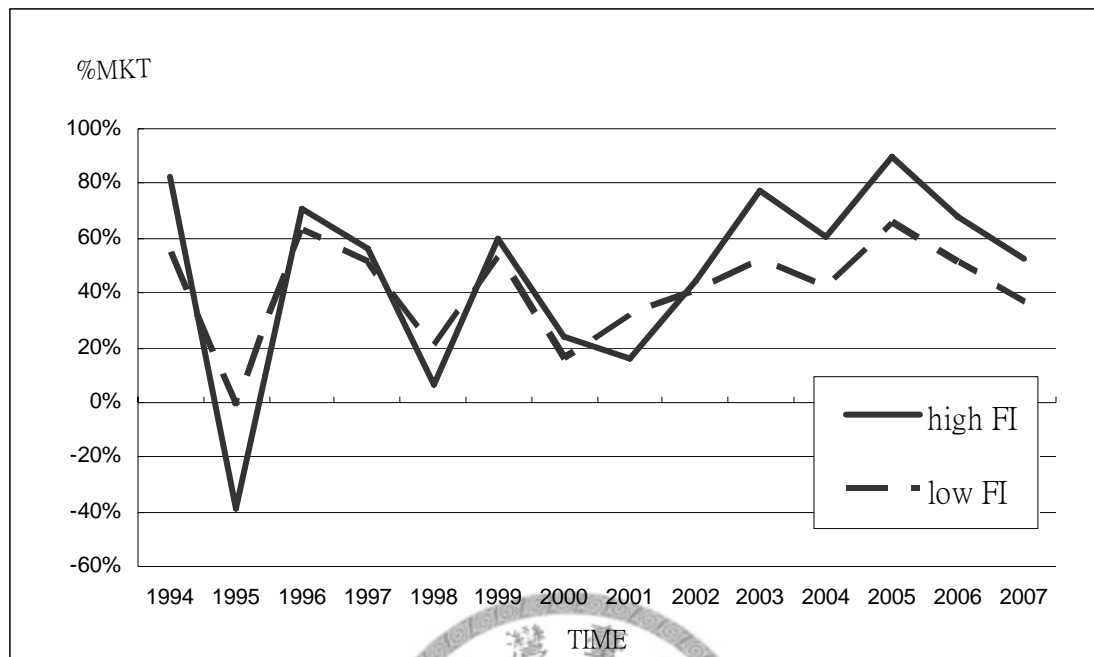
Year	Portfolio 1: Sign_earnings				Portfolio 2: $\Delta$ earnings			
	High FI		Low FI		High FI		Low FI	
	%	%mkt	%	%mkt	%	%mkt	%	%mkt
1994	7.85	15.44	14.13	37.21	41.88	82.38	23.54	54.49
1995	-9.50	-29.96	-0.81	-2.36	-12.41	-39.14	-0.48	-1.40
1996	43.91	52.19	35.10	56.72	59.35	70.54	38.61	62.39
1997	23.86	38.18	24.70	40.81	35.01	56.02	30.98	51.19
1998	1.28	2.58	12.84	25.31	3.23	6.51	10.61	20.91
1999	72.15	60.92	68.08	45.07	70.73	59.72	80.82	53.51
2000	13.05	27.75	9.61	13.87	11.42	24.29	11.25	16.23
2001	15.47	32.41	22.20	33.58	7.75	16.24	21.28	32.18
2002	27.92	36.98	25.48	32.38	33.81	44.78	32.39	41.17
2003	31.51	38.10	28.03	33.40	63.75	77.09	43.35	51.65
2004	31.31	60.42	18.62	36.33	31.29	60.38	21.63	42.20
2005	52.01	71.04	37.74	55.30	65.81	89.89	44.67	65.46
2006	36.07	50.69	31.45	42.25	48.20	67.73	38.04	51.11
2007	31.48	51.64	17.26	30.72	32.06	52.59	20.42	36.35
Average		36.31		34.01		47.79		41.25

- a. Column denoted by “%” is the return on respective accounting-based portfolio 1 & 2.  
 b. “%mkt” is the proportion of return on “returns-based portfolio” that can be earned by holding portfolios according to accounting measures

**Graph 5: %mkt of portfolio 1 (Sign\_earnings) for high and low FI group**



**Graph 6: %mkt of portfolio 2 ( $\Delta$ earnings) for high and low FI group**



**b. Market Valuation Models**

To test if foreign institutional holdings have an effect on value relevance, market valuation models are run by firms delegated in high FI group and those in low FI group separately. This study firstly classifies observations within every year by their level of foreign institutional ownership. If a firm's foreign holdings is higher than yearly average, then it is classified in high FI group; otherwise, low FI group. After deleting observations without data of foreign holdings, I get 1,888 (4,427) firm-year observations for the high (low) FI sample. Model (1), (1.1) and (1.2) are run again for these two subsamples and the results are presented in Table 13. Total explanatory power of model (1) is the adjusted  $R^2$  of the model, denoted as  $\bar{R}_T^2$ ; incremental explanatory

power of earnings and book values are  $\bar{R}_{EPS}^2$  and  $\bar{R}_{BVPS}^2$ , shown at the right most of Table 13. The  $R^2$  decomposition technique is the same as that described previously. Table 13 signals an important phenomenon—IncrBVPS is weighted more heavily in low FI group (4.00% vs. 1.26%) and IncrEPS is weighted heavier in high FI group (16.23% vs. 10.61%). This might be because low FI group is composed of more loss firms and book value is empirically evidenced to have greater explanatory power for loss firms. As shown in Table 1, 85% of the loss firms are categorized in low FI groups, while 70% of loss firms are in the high FI groups. In order to see a clearer trend of value relevance within high and low FI companies, I graph the yearly  $\bar{R}_T^2$  for these two subgroups in Graph



**Table 13: Yearly market valuation models regression results for high/ low FI firms**

**Panel A: High foreign institutional ownership (high FI group)**

		$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \varepsilon_{it}$				$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \varepsilon_{it}$			$P_{it} = \alpha_0 + \alpha_2 \cdot BVPS_{it} + \varepsilon_{it}$			<b>Incr EARN</b>	<b>Incr BVPS</b>
time	N	$\alpha_0$	$\alpha_1$	$\alpha_2$	$\bar{R}_T^2$	$\alpha_0$	$\alpha_1$	$\bar{R}_{1,1}^2$	$\alpha_0$	$\alpha_2$	$\bar{R}_{1,2}^2$	$\bar{R}_{EPS}^2$	$\bar{R}_{BVPS}^2$
1994	57	11.8750 (1.08)	9.6874 (8.25)***	0.8158 (1.19)	0.6815	24.3442 (7.02)***	10.4999 (10.93)***	0.6790	-20.1641 (-1.32)	4.0807 (4.92)***	0.2930	38.85%	0.25%
1995	72	19.4802 (2.64)**	2.2719 (2.57)**	0.8423 (1.72)*	0.2841	31.6147 (14.95)***	3.3210 (5.15)***	0.2642	9.8170 (1.49)	1.7180 (4.67)***	0.2265	5.76%	1.99%
1996	90	31.9793 (2.48)**	10.7036 (8.61)***	0.1908 (0.22)	0.7588	34.7684 (11.84)***	10.9387 (16.88)***	0.7614	-52.9892 (-4.71)***	6.4913 (10.65)***	0.5584	20.04%	-0.26%
1997	87	14.1000 (1.09)	17.4393 (8.02)***	0.0857 (0.10)	0.5704	15.3448 (3.32)***	17.5877 (10.84)***	0.5754	-28.4111 (-1.82)*	4.4907 (5.46)***	0.2506	31.98%	-0.5%
1998	88	-30.1117 (-1.65)	6.4577 (3.13)***	4.3493 (3.69)***	0.4903	35.3854 (7.36)***	12.0075 (7.92)***	0.4153	-66.6128 (-4.50)***	7.0313 (8.30)***	0.4382	5.21%	7.5%
1999	106	-17.9123 (-1.08)	13.8945 (4.12)***	3.2436 (2.84)***	0.5047	25.4746 (3.86)***	21.3321 (9.72)***	0.4711	-56.9924 (-3.91)***	6.9009 (8.93)***	0.4286	7.61%	3.36%
2000	113	5.3368 (0.81)	17.2037 (13.21)***	-0.4924 (-1.02)	0.7663	-0.8727 (-0.33)	16.1908 (19.19)***	0.7662	-40.4936 (-4.48)***	4.3604 (8.72)***	0.4010	36.53%	0.01%
2001	147	-2.3754 (-0.33)	14.7649 (15.25)***	1.1656 (2.57)**	0.7693	14.8946 (6.14)***	16.3576 (21.55)***	0.7604	-54.3422 (-5.40)***	5.5769 (9.94)***	0.4010	36.83%	0.89%
2002	161	0.1969 (0.05)	8.5375 (13.83)***	0.8851 (3.11)***	0.8037	12.2043 (8.37)***	10.0144 (24.78)***	0.7931	-34.1088 (-7.00)***	3.9215 (14.56)***	0.5688	23.49%	1.06%
2003	184	-4.6840 (-0.87)	10.6500 (12.89)***	1.0304 (2.87)***	0.7510	9.4451 (4.19)***	12.4597 (22.91)***	0.7411	-40.9828 (-6.44)***	4.5690 (14.26)***	0.5252	22.58%	0.99%
2004	180	-14.3588 (-2.73)***	7.2930 (8.93)***	1.7628 (4.93)***	0.7253	8.9608 (3.64)***	10.4972 (19.95)***	0.6893	-39.4111 (-7.37)***	4.3021 (16.54)***	0.6037	12.16%	3.6%
2005	192	-13.0974 (-1.22)	18.6195 (11.66)***	0.4689 (0.69)	0.6996	-6.5332 (-1.32)	19.5195 (21.16)***	0.7006	-82.5803 (-7.08)***	6.9262 (13.49)***	0.4865	21.31%	-0.1%
2006	204	-0.525 (-0.07)	10.2371 (11.58)***	1.216 (2.80)***	0.7405	18.0944 (5.23)***	12.25512 (23.55)***	0.7317	-51.1906 (-6.56)	5.3191 (16.42)***	0.5697	17.08%	0.88%
2007	207	-18.1856 (-2.81)***	11.5972 (12.91)***	1.2348 (3.45)***	0.7622	0.0943 (0.02)	14.048 (24.85)***	0.7495	-51.8614 (-6.63)***	4.8398 (16.54)***	0.5683	19.39%	1.27%
<b>FULL</b>	<b>1888</b>	-5.5763 (-2.20)**	10.8816 (29.62)***	1.3538 (8.32)***	0.6509	13.5236 (12.49)***	13.2879 (57.71)***	0.6383	-47.8501 (-18.91)***	5.1539 (42.47)***	0.4886	<b>16.23%</b>	<b>1.26%</b>

a.  $\text{IncrEARN} = \bar{R}_T^2 - \bar{R}_{1,2}^2$ ;  $\text{IncrBVPS} = \bar{R}_T^2 - \bar{R}_{1,1}^2$

b. \*, \*\*, \*\*\* denotes significance under 90%, 95%, 99% confidence level

**Table 13 (continued) Panel B: Low foreign institutional ownership (low FI group)**

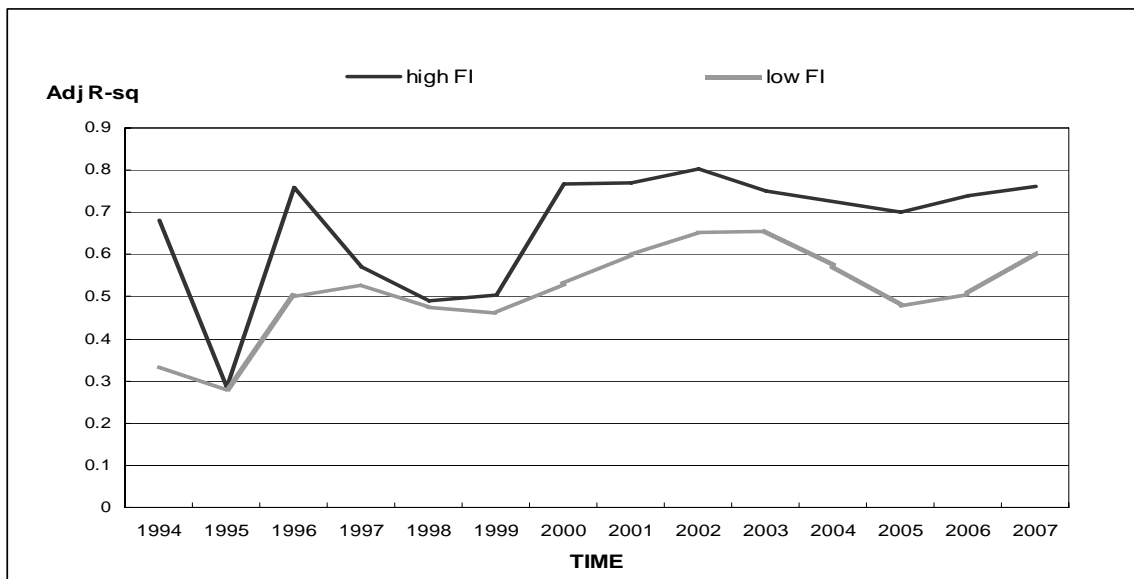
		$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \varepsilon_{it}$				$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \varepsilon_{it}$			$P_{it} = \alpha_0 + \alpha_2 \cdot BVPS_{it} + \varepsilon_{it}$			<b>Incr EARN</b>	<b>Incr BVPS</b>
time	N	$\alpha_0$	$\alpha_1$	$\alpha_2$	$\bar{R}_T^2$	$\alpha_0$	$\alpha_1$	$\bar{R}_{1,1}^2$	$\alpha_0$	$\alpha_2$	$\bar{R}_{1,2}^2$	$\bar{R}_{EPS}^2$	$\bar{R}_{BVPS}^2$
1994	131	5.6824 (1.34)	2.0211 (2.44)**	1.7480 (6.23)***	0.3350	30.5059 (18.82)***	4.0698 (4.71)***	0.1399	4.0511 (0.95)	2.0195 (7.70)***	0.3095	2.55%	19.51%
1995	148	6.5422 (1.85)*	0.3498 (0.71)	1.4464 (6.09)***	0.2799	27.2711 (25.70)***	1.9579 (4.20)***	0.1019	5.5019 (1.71)*	1.5364 (7.67)***	0.2824	-0.25%	17.8%
1996	146	-2.6831 (-0.35)	11.8167 (7.07)***	2.2456 (4.02)***	0.5005	27.0473 (12.38)***	15.6716 (10.89)***	0.4479	-25.3575 (-3.14)***	4.5107 (8.52)***	0.3305	17.00%	5.26%
1997	173	-5.7380 (-0.91)	11.3874 (8.58)***	2.0062 (4.61)***	0.5288	21.8582 (9.99)***	14.7047 (12.46)***	0.4729	-23.4335 (-3.28)***	4.0268 (9.23)***	0.3287	20.01%	5.59%
1998	205	-3.8040 (-0.56)	9.0970 (8.85)***	1.8760 (4.17)***	0.4760	23.3028 (11.27)***	11.3663 (12.54)***	0.4337	-30.0271 (-4.18)***	3.9816 (8.88)***	0.2763	19.97%	4.23%
1999	266	-13.5259 (-2.37)**	6.4264 (7.42)***	2.6183 (6.50)***	0.4621	22.0453 (13.06)***	9.6739 (12.73)***	0.3781	-34.3355 (-6.31)***	4.3468 (12.03)***	0.3518	11.03%	8.4%
2000	321	3.0494 (0.95)	6.7771 (10.17)***	0.7609 (3.25)***	0.5308	12.8609 (12.11)***	8.3867 (18.52)***	0.5167	-17.3524 (-6.07)***	2.5290 (14.04)***	0.3802	15.06%	1.41%
2001	367	-4.0620 (-1.28)	6.0008 (10.43)***	1.6914 (7.08)***	0.6022	17.5635 (18.36)***	8.9451 (21.11)***	0.5486	-25.2775 (-9.08)***	3.4906 (18.58)***	0.4847	11.75%	5.36%
2002	434	1.9896 (1.01)	4.8884 (14.43)***	0.9172 (6.06)***	0.6544	13.4126 (21.88)***	6.4032 (26.93)***	0.6258	-15.9483 (-8.54)***	2.5303 (20.36)***	0.4886	16.58%	2.86%
2003	433	0.7310 (0.37)	5.5071 (14.39)***	1.0139 (6.30)***	0.6567	12.7018 (19.48)***	7.2812 (26.91)***	0.6259	-16.4401 (-8.42)***	2.7179 (20.51)***	0.4927	16.40%	3.08%
2004	442	-1.9114 (-0.98)	3.2237 (10.70)***	1.1294 (7.29)***	0.5723	11.6687 (18.64)***	4.8161 (21.95)***	0.5215	-14.4198 (-8.21)***	2.3309 (19.48)***	0.4619	11.04%	5.08%
2005	450	5.7711 (1.49)	8.0440 (11.89)***	0.6466 (2.13)**	0.4784	13.6094 (11.18)***	9.1203 (20.15)***	0.4742	-22.9943 (-6.65)***	3.3332 (14.40)***	0.3150	16.34%	0.42%
2006	448	1.6597 (0.51)	6.1351 (9.24)***	1.2739 (5.09)***	0.5061	17.0653 (13.33)***	8.7519 (20.28)***	0.4785	-16.5098 (-5.79)***	3.0647 (17.75)***	0.4126	9.35%	2.76%
2007	463	7.1998 (3.13)***	7.3992 (14.57)***	0.4901 (2.90)***	0.6039	13.1876 (12.78)***	8.5364 (26.21)***	0.5975	-10.7463 (-4.57)***	2.3880 (18.41)***	0.4224	18.15%	0.64%
<b>FULL</b>	<b>4427</b>	-0.4434 (-0.45)	5.4789 (29.96)***	1.3629 (18.42)***	0.4769	16.8504 (49.06)***	7.8612 (58.60)***	0.4369	-17.3229 (-19.25)***	2.9303 (51.09)***	0.3708	<b>10.61%</b>	<b>4.00%</b>

a.  $\text{IncrEARN} = \bar{R}_T^2 - \bar{R}_{1,2}^2$ ;  $\text{IncrBVPS} = \bar{R}_T^2 - \bar{R}_{1,1}^2$

b. \*, \*\*, \*\*\* denotes significance under 90%, 95%, 99% confidence level



**Graph 7: Trend of value relevance across high/ low FI firms**



From Graph 7, it is obvious that high FI firms present higher value relevance through these 14 years. Especially after 2000, the trend becomes steadier and keeps at a higher level relatively to that before 2000. When the adjusted  $R^2$  for the full sample gets higher, high FI firms enjoy higher increase in  $\bar{R}_T^2$ ; when the adjusted  $R^2$  for the full sample gets lower, high FI firms enjoy a lower decrease in  $\bar{R}_T^2$ . The trend of  $\bar{R}_T^2$  shown in Graph 7 can be interpreted much the same as Graph 3. However, it is interesting to compare findings in Graph 7 with Graph 5 and 6. In Graph 7, high FI group are higher than low FI group in level of trend of value relevance, but in Graph 5 and 6, high FI firms are sometimes getting a lower  $\%mkt$  than low FI firms. This indicates that under portfolio measure, the low level of  $\%mkt$  of high FI firms in 1995 and 1998 can be alleviated by accounting information other than earnings, for example,

book values of equity which replace earning as a major role in measuring stock prices.

In addition, level of foreign institutional ownership is added into the conventional market valuation model to form model (3):

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_5 \cdot FI_{it} + \alpha_6 \cdot FI_{it} \cdot EPS_{it} + \alpha_7 \cdot FI_{it} \cdot BVPS_{it} + \varepsilon_{it}$$

$FI \cdot EPS$  ( $FI \cdot BVPS$ ) captures FI's impact on the relation between price and EPS (BVPS); if higher FI suggests higher (lower) weight in EPS (BVPS),  $\alpha_6$  ( $\alpha_7$ ) will be significantly positive (negative). The result is tabulated as Table 14. As predicted,  $\alpha_6$  is significantly positive ( $\alpha_6 = 16.9931$ ,  $t=14.78$ ), implying that the higher the level of FI holdings, the higher the weighting earnings are given in stock valuation. However,  $\alpha_7$  is significantly negative ( $\alpha_7 = -1.2296$ ,  $t=-2.38$ ), indicating that investors make less use of equity book values in valuing firms with higher foreign institutional ownership.

However, the reason why higher foreign institutional ownership yields a lower extent of reliance on book values is worth studying.

This study runs model (3) by the full sample, so the composition of the full sample can have an effect on the regression results. As shown in Table 9, profit firms account for an average 82.87%, while loss firms only account for 17.13% of the full sample. Besides, the proportion of loss firms in high FI group (Table 1) is lower. Nevertheless, incremental explanatory power of book value per share of low FI group is prominently higher than that of high FI group, as shown in panel B of Table 13. The low proportion

of loss firms might be the reason why book value of equity cannot play a significant positive role in stock valuation in model (3), and remark that foreign institutional ownership has negative effect on utilization of equity book values in stock valuation cannot be reached so early. In the following paragraph, after separating the full sample into profit and loss firms, this study further supports the guess.

### ***Profit and loss firms***

In the same token, model (4) tries to see if the valuation effect of foreign institutional ownership is different between profit and loss firms.

$FI \cdot BVPS \cdot D$  ( $FI \cdot EPS \cdot D$ ) captures the effect FI has on the relation between price and BVPS (EPS) for loss firms. The result is shown in Table 15, which says that  $\alpha_6$  and  $\alpha_9$  are both significantly positive ( $\alpha_6=9.7244$ ,  $t=8.27$ ;  $\alpha_9=1.7201$ ,  $t=1.88$ ),  $\alpha_7$  and  $\alpha_8$  are both negative ( $\alpha_7=-0.3627$ ,  $t=-0.74$ ;  $\alpha_8=-13.4473$ ,  $t=-3.67$ ). Explanation for this result is that investors tend to utilize earnings (equity book values) more when valuing profit (loss) firms that are with higher foreign institutional holdings. This implies that foreign institutional ownership does enhance value relevance but in a different way for profit and loss firms. This result seems to contradict with that of model (3). In Table 14, it shows a negative coefficient estimate on  $FI \cdot BVPS$ , but Table 15 shows a significantly positive coefficient estimate on  $FI \cdot BVPS \cdot D$ . This might be attributed to the disproportional amount of profit and loss firms in our sample, as explained in last

paragraph. Model (3), which doesn't distinguish the effect on profit firms from that on loss firms, it is reasonable to find a negative coefficient on book value because of the much higher proportion of profit firms in the regression sample.

**Table 14: Regression result for model (3)**

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_5 \cdot FI_{it} + \alpha_6 \cdot FI_{it} \cdot EPS_{it} + \alpha_7 \cdot FI_{it} \cdot BVPS_{it} + \varepsilon_{it}$$

This model is used to investigate the effect foreign institutional ownership (FI) has on EPS (BVPS) and price. If investors make use of earnings or book values more in valuation of firms with higher FI,  $\alpha_6$  and  $\alpha_7$  should be significantly positive.

Variable	Coefficient	Predicted Sign	Estimate
Intercept	$\alpha_0$	+/-	-1.8344 (-1.42)
EPS	$\alpha_1$	+	5.7700 (25.14)***
BVPS	$\alpha_2$	+	1.4868 (15.65)***
FI	$\alpha_5$	+	-2.7792 (-0.35)
FI · EPS	$\alpha_6$	+	16.9931 (14.78)***
FI · BVPS	$\alpha_7$	+	-1.2296 (-2.38)**
Adj-R <sup>2</sup>			0.6240
N			6329

a. \*\*, \*\*\* denotes significance under 95% and 99% confidence level

**Table 15: Regression result for model (4)**

This table shows the regression results for model (4), in order to see the impact foreign institutional ownership has on the relation between EPS (BVPS) and stock price. P is stock price ending at the 5<sup>th</sup> month after close of fiscal year t-1.

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_3 \cdot EPS_{it} \cdot D_{it} + \alpha_4 \cdot BVPS_{it} \cdot D_{it} + \alpha_5 \cdot FI_{it} + \alpha_6 \cdot FI_{it} \cdot EPS_{it} + \alpha_7 \cdot FI_{it} \cdot BVPS_{it} + \alpha_8 \cdot FI_{it} \cdot EPS_{it} \cdot D_{it} + \alpha_9 \cdot FI_{it} \cdot BVPS_{it} \cdot D_{it} + \varepsilon_{it}$$

Variable	Coefficient	Predicted Sign	Estimate (t-statistics)
Intercept	$\alpha_0$	+/-	-2.9476 (-2.43)**
EPS	$\alpha_1$	+	9.8819 (36.18)***
BVPS	$\alpha_2$	+	0.9580 (10.45)***
EPS · D	$\alpha_3$	-	-10.4575 (-21.87)***
BVPS · D	$\alpha_4$	+	0.3038 (3.18)***
FI	$\alpha_5$	+	-10.0280 (-1.34)
FI · EPS	$\alpha_6$	+	9.7244 (8.27)***
FI · BVPS	$\alpha_7$	-	-0.3627 (-0.74)
FI · EPS · D	$\alpha_8$	-	-13.4473 (-3.67)
FI · BVPS · D	$\alpha_9$	+	1.7201 (1.88)*
Adj-R <sup>2</sup>			0.6696
N			6329

a. \*, \*\*, \*\*\* denotes significance under 90%, 95% and 99% confidence level

### ***Valuation effect of changes in foreign institutional ownership***

Extending from model (4), I divide the effect FI has on value relevance into foreign institutional holdings of last period (LFI) and the incremental effects from change of FI (Dhaliwal et al. 2005). A dummy, INC, is added into the model to present the direction of change in FI. INC is set as 1 if current period FI is higher than that of last period; otherwise, INC=0. If increase in FI has significant effect on relevance of accounting numbers, coefficient estimates on interaction variable  $INC \cdot EPS$  and  $INC \cdot BVPS$  will be significantly different from zero. Dummy representing profit and loss firms is also inserted in this model due to the different impacts foreign holdings has on these two categories of firms. Regression results of model (5) in Table 16 shows that  $\alpha_1$ ,  $\alpha_2$ ,  $\alpha_3$  and  $\alpha_4$  all conform to the results that have been presented in previous models, indicating that the consideration of foreign institutional ownership doesn't change the important roles earnings and book values play in stock valuation. In addition,  $\alpha_6$ ,  $\alpha_7$ ,  $\alpha_8$  and  $\alpha_9$  are also complying with the findings in Table 15. This means that FI holdings in last period also affect investors' extent of reliance on EPS or BVPS when valuing stocks. What more important in Table 16 is the interpretation of  $\alpha_{11}$ ,  $\alpha_{12}$ ,  $\alpha_{13}$  and  $\alpha_{14}$ . As shown in Table 16,  $\alpha_{11}$  and  $\alpha_{14}$  both significantly accord with signs predicted ( $\alpha_{11}=3.9541$ ,  $t=9.94$ ;  $\alpha_{14}=0.3259$ ,  $t=1.95$ );  $\alpha_{12}$  and  $\alpha_{13}$  are both significantly negative ( $\alpha_{12}=-0.3651$ ,  $t=-4.85$ ;  $\alpha_{13}=-4.2607$ ,  $t=-4.85$ ). This implies that increase or decrease in level of FI does

have information content for investors to change the extent of their reliance on financial numbers, further supporting the remarks that foreign institutional ownership has a positive relationship with value relevance and with increase in the level of FI, investors depend more on EPS (BVPS) when valuing stocks of profit (loss) firms.



**Table 16: The valuation effect of change of FI**

This regression model is used to test the different effects FI and the direction of change in FI can have on the investors' utilization of EPS and BVPS in stock valuation, the model specified below has P, the stock price at the end of the 5<sup>th</sup> month after the close of fiscal year t-1; LFI, the level of foreign institutional ownership in last period; INC, which is set to 1 if current-period FI is higher than FI of previous period. T-statistics show in the parentheses of every coefficient estimate.

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_3 \cdot EPS_{it} \cdot D_{it} + \alpha_4 \cdot BVPS_{it} \cdot D_{it} + \alpha_5 \cdot LFI_{it} + \alpha_6 \cdot LFI_{it} \cdot EPS_{it} + \alpha_7 \cdot LFI_{it} \cdot BVPS_{it} + \alpha_8 \cdot LFI_{it} \cdot EPS_{it} \cdot D_{it} + \alpha_9 \cdot LFI_{it} \cdot BVPS_{it} \cdot D_{it} + \alpha_{10} \cdot INC_{it} + \alpha_{11} \cdot INC_{it} \cdot EPS_{it} + \alpha_{12} \cdot INC_{it} \cdot BVPS_{it} + \alpha_{13} \cdot INC_{it} \cdot EPS_{it} \cdot D_{it} + \alpha_{14} \cdot INC_{it} \cdot BVPS_{it} \cdot D_{it} + \varepsilon_{it}$$

Variable	Coefficient	Predicted Sign	Estimate
Intercept	$\alpha_0$	+/-	-3.3881 (-2.23)**
EPS	$\alpha_1$	+	7.4056 (21.60)***
BVPS	$\alpha_2$	+	1.1593 (10.09)***
EPS · D	$\alpha_3$	-	-7.9921 (-14.73)***
BVPS · D	$\alpha_4$	+	0.1171 (1.00)
LFI	$\alpha_5$	+	-10.2479 (-1.37)
LFI · EPS	$\alpha_6$	+	10.3516 (8.73)***
LFI · BVPS	$\alpha_7$	-	-0.4138 (-0.85)
LFI · EPS · D	$\alpha_8$	-	-13.5543 (-3.66)***
LFI · BVPS · D	$\alpha_9$	+	1.9369 (2.14)**
INC	$\alpha_{10}$	+	-0.2491 (-0.13)
INC · EPS	$\alpha_{11}$	+	3.9541 (9.94)***
INC · BVPS	$\alpha_{12}$	-	-0.3651 (-4.85)***
INC · EPS · D	$\alpha_{13}$	-	-4.2607 (-4.85)***
INC · BVPS · D	$\alpha_{14}$	+	0.3259 (1.95)*
Adj-R <sup>2</sup>			0.6911
N			5833

a. \*, \*\*, \*\*\* denotes significant under 90%, 95%, 99% confidence level



#### ***5.4 Foreign institutional ownership and the roles they play***

Next, I examine this topic by putting financial institutional holdings (FI) and financial health indicators (ROA/ROE/Debt ratio) into the valuation model together, in order to see if financial institutional investors are viewed by the market as merely informed investors that signal a firm's financial health and profitability, or they are perceived as active players that can dynamically affect a firm's operational prospects.

Table 17 presents the single regression model run for each financial health indicator and

I find that coefficients on  $ROA \cdot EPS$  ( $ROE \cdot EPS$ ),  $ROA \cdot BVPS$  ( $ROE \cdot BVPS$ ) and  $DR \cdot EPS$  ( $DR \cdot BVPS$ ) are all significantly different from zero. It means that higher profitability (ROA and ROE) and lower debt burden (DR) can facilitate higher relevance of earnings per share in stock valuation. In addition, the coefficient on  $DR \cdot EPS$  is significantly negative, indicating that firms with higher debt level are perceived by investors as having earnings less relevant to true operating situations.

However, the significantly positive coefficient on  $DR \cdot BVPS$  means that when debt ration gets higher, book value of equity becomes the major factor affecting stock price measurement. Table 17 shows that financial indicators representing profitability and solvency are taken into consideration in stock valuation by the market, which is consistent with Barth et al. (1998). Hence, adding these indicators into the model along with foreign institutional ownership (FI) might be able to bring about other possible

interpretations for FI, if they do exist. Table 18 shows the regression results.

From discussions in this paper, it has evidenced that in Taiwan stock market, foreign institutional ownership and the change in the level of FI holdings do affect the extent investors utilizing accounting numbers. Model (6), (7) and (8), however, are used to test if the same phenomenon can be detected after controlling for a firm's current financial states. Proxies for financial health are: ROA, ROE and debt ratio; they are added into the model respectively along with foreign institutional ownership (FI). If coefficients on interaction terms:  $FI \cdot EPS$ ,  $FI \cdot BVPS$ ,  $FI \cdot EPS \cdot D$ , and  $FI \cdot BVPS \cdot D$  ( $\alpha_6$ ,  $\alpha_7$ ,  $\alpha_8$  and  $\alpha_9$ ) become insignificant or change into wrong signs, this means that FI holdings are perceived by the market just as an indicator of financial health of a company so that when controlling for current financial health (represented by ROA, ROE and debt ratio), FI is replaced by other more prevalently-used financial ratios to affect investor's utilization of accounting numbers.

As shown in Table 18,  $\alpha_6$ ,  $\alpha_7$ ,  $\alpha_8$  and  $\alpha_9$  all keep in predicted directions, indicating that for profit (loss) firms with higher FI holdings, earnings (book values) are still be weighted more heavily in stock valuation. Dhaliwal et al. (2005) state that if still finding  $\alpha_6$ ,  $\alpha_7$  and  $\alpha_9$  significantly different from zero in the right direction after one controls company's current financial health, then "these results suggest that the level of institutional ownership serves more than a mere proxy for the current measures of

financial health such as ROA and ROE.” In this case, Taiwan’s foreign institutional investors play more than a fiduciary but also a governance role in their investees.



**Table 17: Regression results for ROA, ROE and DR-model**

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \beta_0 \cdot ROA_{it} + \beta_1 \cdot ROA_{it} \cdot EPS_{it} + \beta_2 \cdot ROA_{it} \cdot BVPS_{it} + \varepsilon_{it}$$

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \gamma_0 \cdot ROE_{it} + \gamma_1 \cdot ROE_{it} \cdot EPS_{it} + \gamma_2 \cdot ROE_{it} \cdot BVPS_{it} + \varepsilon_{it}$$

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \lambda_0 \cdot DR_{it} + \lambda_1 \cdot DR_{it} \cdot EPS_{it} + \lambda_2 \cdot DR_{it} \cdot BVPS_{it} + \varepsilon_{it}$$

ROA				ROE				DR			
Variable	Co-efficient	Predicted sign	Estimate	Variable	Co-efficient	Predicted sign	Estimate	Variable	Co-efficient	Predicted sign	Estimate
Intercept	$\alpha_0$	+/-	-0.2184 (-0.19)	Intercept	$\alpha_0$	+/-	-3.5880 (-3.55)***	Intercept	$\alpha_0$	+/-	-2.8500 (-1.98)**
EPS	$\alpha_1$	+	3.1728 (8.23)***	EPS	$\alpha_1$	+	1.1599 (2.49)**	EPS	$\alpha_1$	+	11.1849 (46.10)***
BVPS	$\alpha_2$	+	1.1536 (13.67)***	BVPS	$\alpha_2$	+	1.3910 (19.23)***	BVPS	$\alpha_2$	+	0.9998 (10.11)***
ROA	$\beta_0$	+	-0.3783 (-3.95)***	ROE	$\gamma_0$		-0.000753 (-0.03)	DR	$\lambda_0$	-	-2.0439 (-0.96)
ROA · EPS	$\beta_1$	+	0.1082 (10.09)***	ROE · EPS	$\gamma_1$	+	0.0641 (12.31)***	DR · EPS	$\lambda_1$	-	-5.8603 (-16.43)***
ROA · BVPS	$\beta_2$	+	0.0654 (8.19)***	ROE · BVPS	$\gamma_2$	+	0.0544 (9.76)***	DR · BVPS	$\lambda_2$	+	0.8377 (5.48)***
Adj-R <sup>2</sup>			0.6602				0.6583				0.6151
N			6328				6328				6329

a. \*, \*\*, \*\*\* denotes significant at 90%, 95%, 99% confidence level

b. ROA is return on assets; ROE is the continuing operating income on equity; DR is total debt to total assets

**Table 18: Regression results of models controlling for financial health**

ROA, ROE and debt ratio is added in to model (3) respectively in order to see if the impact FI has on stock valuation can be replaced by these financial health indicators. ROA, ROE and debt ratio have been evidenced in Table 11.1 as influential factors that can affect investors' utilization of accounting numbers.

**model (6) & model (7):**

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_3 \cdot EPS_{it} \cdot D_{it} + \alpha_4 \cdot BVPS_{it} \cdot D_{it} + \alpha_5 \cdot FI_{it} + \alpha_6 \cdot FI_{it} \cdot EPS_{it} + \alpha_7 \cdot FI_{it} \cdot EPS_{it} + \alpha_8 \cdot FI_{it} \cdot BVPS_{it} + \alpha_9 \cdot FI_{it} \cdot EPS_{it} \cdot D_{it} + \alpha_{10} \cdot FI_{it} \cdot BVPS_{it} \cdot D_{it} + \beta_0(\gamma_0) \cdot ROA_{it}(ROE_{it}) + \beta_1(\gamma_1) \cdot ROA_{it}(ROE_{it}) \cdot EPS_{it} + \beta_2(\gamma_2) \cdot ROA_{it}(ROE_{it}) \cdot BVPS_{it}$$

**model (8):**

$$P_{it} = \alpha_0 + \alpha_1 \cdot EPS_{it} + \alpha_2 \cdot BVPS_{it} + \alpha_3 \cdot EPS_{it} \cdot D_{it} + \alpha_4 \cdot BVPS_{it} \cdot D_{it} + \alpha_5 \cdot FI_{it} + \alpha_6 \cdot FI_{it} \cdot EPS_{it} + \alpha_7 \cdot FI_{it} \cdot EPS_{it} + \alpha_8 \cdot FI_{it} \cdot BVPS_{it} + \alpha_9 \cdot FI_{it} \cdot EPS_{it} \cdot D_{it} + \alpha_{10} \cdot FI_{it} \cdot BVPS_{it} \cdot D_{it} + \lambda_0 \cdot DR_{it} + \lambda_1 \cdot DR_{it} \cdot EPS_{it} + \lambda_2 \cdot DR_{it} \cdot BVPS_{it}$$

ROA (model 6)				ROE (model 7)				DR (model 8)			
Variable		Sign <sup>a</sup>	Estimate	Variable		Sign <sup>a</sup>	Estimate	Variable		Sign <sup>a</sup>	Estimate
Intercept	$\alpha_0$	+/-	-1.0230 (-0.78)	Intercept	$\alpha_0$	+/-	-1.4479 (-1.19)	Intercept	$\alpha_0$	+/-	-0.6438 (-0.40)
EPS	$\alpha_1$	+	5.3559 (10.65)***	EPS	$\alpha_1$	+	4.3522 (7.47)***	EPS	$\alpha_1$	+	10.2057 (32.20)***
BVPS	$\alpha_2$	+	0.8306 (8.40)***	BVPS	$\alpha_2$	+	0.9591 (10.40)***	BVPS	$\alpha_2$	+	0.8193 (7.17)***
EPS · D	$\alpha_3$	-	-7.1182 (-10.49)***	EPS · D	$\alpha_3$	-	-6.5995 (-9.38)***	EPS · D	$\alpha_3$	-	-10.2798 (-19.69)***
BVPS · D	$\alpha_4$	+	0.3822 (4.01)***	BVPS · D	$\alpha_4$	+	0.3664 (3.86)***	BVPS · D	$\alpha_4$	+	0.3134 (3.28)***
FI	$\alpha_5$	+	-10.9049 (-1.43)	FI	$\alpha_5$	+	-10.9940 (-1.48)	FI	$\alpha_5$	+	-12.3794 (-1.64)
FI · EPS	$\alpha_6$	+	8.6203 (6.84)***	FI · EPS	$\alpha_6$	+	7.9353 (6.44)***	FI · EPS	$\alpha_6$	+	9.3200 (7.82)***
FI · BVPS	$\alpha_7$	-	-0.0917 (-0.18)	FI · BVPS	$\alpha_7$	-	0.03264 (0.07)	FI · BVPS	$\alpha_7$	-	-0.1868 (-0.38)
FI · EPS · D	$\alpha_8$	-	-12.9630 (-3.52)***	FI · EPS · D	$\alpha_8$	-	-10.5619 (-2.76)***	FI · EPS · D	$\alpha_8$	-	-13.2652 (-3.62)***
FI · BVPS · D	$\alpha_9$	+	1.8185 (1.99)**	FI · BVPS · D	$\alpha_9$	+	1.7659 (1.93)*	FI · BVPS · D	$\alpha_9$	+	1.7238 (1.88)*
ROA	$\beta_0$	+	0.0470 (0.46)	ROE	$\gamma_0$	+	-0.0375 (-1.28)	DR	$\lambda_0$	-	-3.9876 (-2.00)**
ROA · EPS	$\beta_1$	+	0.000674 (0.05)	ROE · EPS	$\gamma_1$	+	0.0052 (0.78)	DR · EPS	$\lambda_1$	-	-0.6944 (-1.87)*
ROA · BVPS	$\beta_2$	+	0.05994 (7.49)***	ROE · BVPS	$\gamma_2$	+	0.0483 (8.79)***	DR · BVPS	$\lambda_2$	+	0.2463 (1.70)*
Adj-R <sup>2</sup>			0.6760	Adj-R <sup>2</sup>			0.6755	Adj-R <sup>2</sup>			0.6699
N			6328	N			6328	N			6329

a. predicted sign. b. \*, \*\*, \*\*\* denotes significant under confidence level of 90%, 95%, 99%

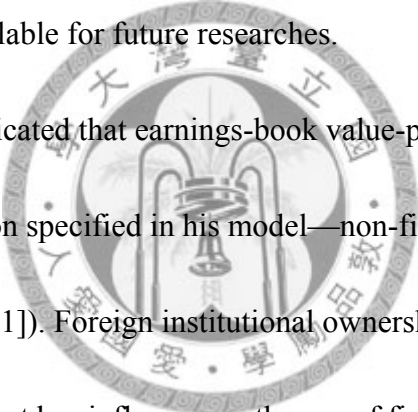
## 6. Concluding Remarks

This paper investigates the relationship between foreign institutional ownership and value relevance in Taiwan stock market from 1994-2007. In periods when Taiwan stock market experienced high volatility, financial statements lost more of its relevance; however, different causes of market volatility can lead to different perception of financial statement's reliability. Since the deregulation of investment ceilings for foreign investors in 2001, followed by Taiwan's participation in WTO in 2002, the trend of the combining explanatory power of earning and equity book values become much steadier than before. Trend regression also shows a significant positive slope coefficient, indicating that the overall tendency of value relevance is increasing.

Empirical results further document a positive association between foreign ownership and value relevance. With the increase in FI holdings, earnings (book values) are weighted more for profit (loss) firms, consistent with the findings documented by Dhaliwal et al. (2005). Furthermore, this paper finds that foreign institutions in Taiwan are perceived by the market not only as short-term oriented speculators but also an indicator of a firm's current and future operating prospects.

Some constraints of this study are as follows. First, the point of time every company releases its share structure is inconsistent, this poses some difficulties in choosing a proper stock price as dependent variable. Second, the problem of "fake

foreign capital” should be a concern. Foreign capital is investment capital remitted from foreign countries. Domestic capital after layers of management can become “foreign capital” which is hard to detect by regulators. Fake foreign capital can blur the real level of foreign institutional holdings and mislead the conclusions made from market valuation models. Third, according to Lin et al. (2008), panel data regression yields better regression results than general regression. Since yearly data is used in this study, the adoption of panel data will cause too small sample size. The use of panel data for a longer period might be available for future researches.



Some studies have indicated that earnings-book value-price model neglects another important component Ohlson specified in his model—non-financial information (Lo and Lys, [2000]; Peng, [2001]). Foreign institutional ownership is actually one of non-financial information that has influence on the use of financial numbers. As Dontoh et al. (2004) propose, non-information-based trading is one of the major contributors to change of value relevance. Therefore, more non-financial information that has an impact in stock valuation is worth investigating. Besides, how and to what extent foreign institutional investors play governance roles in their investees also worth further investigation. In view of the gradual deregulation of economic restrictions between Taiwan and Mainland China, “foreign capital” will become no less important than now, which paves the way for continuing studies on this topic.

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