Investigating Net Purchases Accompanying Unexpected Investment Income of Taiwan's Companies

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Abstract

Consistent with the prevelance of firms' investment in South East Asia and Mainland China, Taiwan's companies differ significantly from foreign firms in both magnitude and persistence of investment income. This study explores the difference in net purchases triggered by unexpected investment income, which is a non-operating item in financial reporting. It shows that, despite the fact that investment income is value relevant, foreign investors, as compared with the other investors, appear to under-react to investment income reported by Taiwan's companies due to unfamiliarity of cross-holding activities prevalent in this market. Our results support the notion of investors' bias in analyzing investment targets in foreign markets. The paper also documents a less pronounced net purchase response to unexpected investment income for foreign investors during the boom regimes and vise versa.

Keywords: *Investment income, Net purchases.*

1. INTRODUCTION

This study focuses on the difference in business practices which might result in investors' misinterpreting the components of earnings and provides evidence that cross-border investors may still under- or over-react to the accounting information provided by businesses in other countries with similar accounting standards. Among the accounting variables, the difference in foreign versus domestic investors' reactions may be the most pronounced with respect to investment gains/losses.[1]

Many prior studies in the related fields compare the information content for different components of accounting earnings, which may be the summary measures most frequently used by foreign investors. For instance, Swaminathan and Weintrop (1991) find that both revenues and expenses have information content that is incremental to earnings. Furthermore, Lipe (1986) analyzes the six components routinely reported in financial disclosures - gross profits, general and administrative expenses, depreciation expenses, interest expenses, income taxes, and other items - and suggests that each component provides a different piece of information to the stock market. In contrast, this paper concentrates on the issue that whether the perceived information content for a certain accounting earnings component would differ between home and foreign market participants. Specifically, it examines foreign investors' (called Qualified Foreign Institutional Investors, QFII, in Taiwan) versus domestic investors' net purchases triggered by unexpected investment income under the equity method.

Overall, this study contributes to both academia and real-world operation in two ways. First, the findings help reflect the distinction of non-operating versus transitory accounting items. Second, this paper implies that investors may cling to their experience in interpreting certain accounting earnings components from their home countries when they engage in cross-national investment.
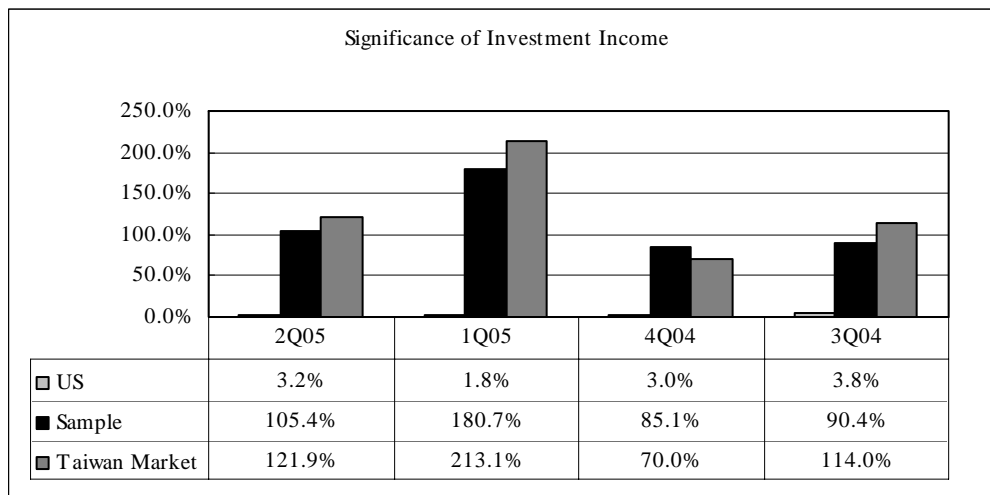
ANALYSTS' VIEWS ON INVESTMENT INCOME

Based on the APB Opinion No.18, companies hold an interest greater than 20 percent in an investee company need to use equity method to recognize investment income. This income is classified under the non-operating section in financial statements. Hence, investors may treat the item as a transitory component because of such classification. In contrast, the persistence of investment income could vary

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[1] In general, both foreign and domestic investors are likely to regard operating income components as permanent accounting items. With respect to non-operating income items other than investment gains/losses, both foreign and domestic investors are likely to regard them as transitory earnings components.

from business to business. In the United States, the reciprocal shareholding among companies is not as common as it is in Taiwan. Therefore, US investors might interpret investment income differently from investors in Taiwan. If investors do not change their attitude towards investment income when investing in a foreign market, they may be running the risk of making mistakes.

For U.S. and Taiwan companies, investment income plays a significantly different role in company earnings. Figure 1 shows that companies in Taiwan report a mean investment income of 90% of their operating income or sometimes as high as 150%, which is significantly greater than the number shown for U.S. companies. Investment income is classified as a non-operating item in financial reporting but is with equivalent significance to corporate earnings as the operating income. Another way to put this would be that for most Taiwan companies, net income can be greatly influenced by investment income. Nevertheless, this non-operating item may be trivial when investors valuate U.S. companies.

Significance of Investment Income

	2Q05	1Q05	4Q04	3Q04
US	3.2%	1.8%	3.0%	3.8%
Sample	105.4%	180.7%	85.1%	90.4%
Taiwan Market	121.9%	213.1%	70.0%	114.0%

FIGURE1 Significance of Investment Income[2]

The following excerpt from a research report on Taiwan Semiconductor Company illustrates the difference in viewpoints on investment income between QFII and local investors. The paragraph below is an operating summary of TSMC in the first quarter of 2005 from Taiwan International Securities Groups (TISC Group), one local brokerage firm in Taiwan.

"The 05Q1 result is better than market's expectation. … Gross margin also declines

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[2] *Note*: This figure reports relative significance of investment income and operating profits (the absolute value of investment income divided by the absolute value of operating profits) from 3Q04 to 2Q05. The US data consist of five stocks on Dow Jones Index, HP (HPQ), Intel (INTC), Coke-Cola (KO), McDonald (MCD) and Microsoft (MSFT). The observations with extreme values (maximum and minimum) are excluded from the sample group. The Taiwan Market data consist of all listed companies in Taiwan Stock Exchange (TSE).

from 42.51% in 04Q4 to 38.9% in 05Q1 because of the decline in both wafer production and utilization rate. *In the non-operating income and loss section, although it has a payment for reconciliation from SMIC, its loss from short-term investment and exchange has offset most of the non-operating income. Moreover, its long-term investment loss is 198 million, mainly attributable to the strong profit decline from WaferTech and VIS."* (Lin 2005)

In contrast, the following excerpt from the research report of Bear Stern, an international brokerage firm operating in Taiwan, suggests that Bear Stern views the importantace of investment income differently.

"1Q05 revenue was reported earlier at NT$55.653bn, …. We also factor in a 4% appreciation in the NT$/US$ rate. The weakness in 1Q was broad-based and mainly because of inventory correction among its customers, in our view. We expect gross margin to decline to 38.4% in 1Q05 from 42.5% in 4Q04, in line with the company guidance of 38%-40%. We forecast an operating margin of 28.6% in 1Q05 versus 32.9% in 4Q04. We have modeled a utilization rate of 77% in 1Q05; largely in line with the company guidance of 78%. … Muted growth in 2Q is mainly attributable to weakness in handset chip orders due to customer inventory adjustments, in our view. We do not expect any deviation in capex plans for 2005 from the earlier-announced US$2.4bn-US$2.6bn, as the company's 12-inch fab is still running at full capacity." (Wong and Tse 2005)

The main discrepancy between foreign analysts and local analysts arises from the significance of investment income they perceived. Local analysts tend to give more attention to the non-operating section- particularly the investment income, while foreign analysts incline to focus on the industry prospective and the firm's operating activities.

Another phenomenon we find is that economic boom-bust cycles would affect foreign analysts' attitude toward investment income too. These analysts have a tendency to neglect investment income when the economy is booming. Since the economy is booming, businesses are likely to engage in a broader range of business activities. As a result, the issues worth exploring in analysts' reports are not limited to changes of investment income, which therefore is more likely to be neglected.

Delta Electronics, with persistent and stable investment income, serves as a good illustration. In December 2001, when Taiwan's cyclical indicators flashed a yellow blue light with a score of 9 points, which indicated a recession was under way, Credit Suisse First Boston (CSFB) issued a research report titled "Investments

could lead to EPS upside" as follows:

> "Delta Taiwan had a total reinvestment balance of NT$23 billion by 1Q01. Among its investments, Delta Thailand and Cyntec are the two listed and most profitable subsidiaries. Delta's holding stake in Delta Thailand is 20% and in Cyntec is 38%, as in August 2001.We expect these two ventures to continue to contribute handsome profits to the parent company, Delta Taiwan, in 2002 and 2003.

> Delta is Thailand's largest listed technology company. It specializes in CRT monitors, SPS and components (EMI filters and magnetic). Production is done in Thailand, with CRT monitors and SPS contributing more than 90% of the company's revenue. Delta is related to Delta Taiwan, which, together with a family-held company, owns close to 70% of Delta Thailand.

> Cyntec was established in 1991 and listed on the Taiwan Stock Exchange in 2001. It focuses on passive components, such as chip resistors, sensors and hybrid components. The company posted a net income of NT$301 million in 2000, up 67% ….. Cyntec is guiding growth in its bottom line of 30% in 2001." (Chang and Wang 2001)

When the economy recovered from the trough and scored a 35-point high on the cyclical monitoring scale in July 2004, the CFSB analysts changed their viewpoint towards the company's investment activities. They wrote an investment note to highlight the growth drivers of Delta Electronics but investment income was not included (but no reference to investment income was made).

> "*Power supply:* Delta's worldwide market share in higher-margin server SPS has been growing to 50% and NB adapter to 35-40%. On the other hand, Delta has a 12-13% global market share in lower-margin desktop SPS, down from the previous 20-25% global share before 2002.

> *Networking business* is still slow …, but margins improve… *Projectors* sales improved in 2Q04, due to an ease of lamp supply from Philip and OSRAM. There was a 30% supply shortage to demand in 1Q04. Delta's projector customers include European white-box channel, Epson, Sony, and Barco.

> *Long-term catalysts* will include RPTV and CCFL for LCD TV panels. Delta's customer for RPTV is currently Gateway. We believe growth of RPTV products will depend on its penetration to ODM for Japanese major TV brand names. Delta will set up three CCFL production lines in 2004, mainly for LCD TV panels, and will add another seven lines in 2005." (Chang and Wang 2001)

From the anecdotes of TSMC and Delta illustrated above, two primary sentiments on investment income and foreign investors may be summarized. First, because the business practices in Taiwan differ from those in other countries, foreign investors may underreact to investment income disclosed in financial reporting, which holds a different meaning in corporate valuation among Taiwan's companies. Second, when the economy is expanding, foreign investors appear to neglect investment income because there would be a wider variety of issues to be covered in their fundamental analyses.

2. HYPOTHESES

We aim at exploring two related issues. First, in view of the common practices of corss-holding pursued by businesses in Taiwan, we investigate whether investment income is value relevant. Second, we examine how differently (domestic and foreign) investors react to the investment income component reported in financial statements.

Although there are numerous papers discussing the information content of accounting data, no consensus is reached yet. Areas of research focus are primarily on EPS and revenue numbers. But few of them refer to the investment income component. From the prior study conducted by Ball and Brown (1968), at least half of the amount of information which becomes available regarding a company during a year is captured by analyzing its reported income. But Ball and Brown (1968) do not decompose the income component into seperate revenue and expense items and investigate their contributions to the information individually. On the other hand, Lev (1989) finds evidence that while earnings appear to be used by investors, the extent to which earnings summarize the information which is useful for firm valuation is still limited. Based on Lev's finding, the low information content is due to biases induced by accounting measurement and valuation principles and, in some cases, to the manipulation of reported data by managers. This paper adopts the research design used by Fairfield, Sweeney and Yohn (1996), who disaggregate earnings into operating earnings, non-operating earnings, and special items and find that the contribution of these earnings to predicting future earnings can be improved, in examining whether investment income, a non-operating item, is value relevant.

Different business practices may contribute to foreign investors' under- or over-reactions towards investment income reported by firms in Taiwan, where cross-holding is prevelent among businesses. In order to stay competitive, it's hardly rare for domestic businesses to seek collaboration with other counterparts through vertical integration or strategic alliance. Most of these relationships are

long-term and connected with stock investment. Furthermore, a large number of Taiwan's businesses heavily invest in South East Asia and Mainland China; therefore, they differ significantly from foreign firms in terms of magnitude as well as persistence of investment income. Thus businesses in Taiwan may have higher persistence in investment income than those in other countries. With such differences, the comparison tests focusing on investment income for the level of investor sophistication would be more pronounced. This study measures the level of investment income by deflating the mean historical investment income per share by the standard deviation of historical investment income per share. Table 1 demonstrates the persistence of investment income reported by Taiwan companies. The greater ratio in the last column is, the higher persistence in investment income a company has. Many of these companies have stable and persistent investment income. Based on these results, we construct the first hypothesis as follows:

H1: The investment income component (under equity method) is value relevant.

Given that investment income of companies in Taiwan is stable and persistent, we aim to explore the extent to which investors react to this accounting item. Consistent with the notion that market participants rationally react to differences in the time-series properties of the earnings components, Lipe (1986) documents a positive association between the A-coefficients (defined as the dollar return reaction associated with a one-dollar component shock) and the persistence measures. On the other hand, we conjecture that because of their home country experiences, foreign investors may have different viewpoints on certain accounting items than domestic investors, for instance, the investment income. The research reports from Taiwan International Securities Groups and Bear Stern on the same company, TSMC, can serve as good examples. The former gives more attention to the investment income item than the latter and we suggest this phenomenon is common between domestic and foreign investors.

To investigate investors' behavior, we adopt the same research design as Bamber (1987) does. He uses net purchase volume to examine investors' reaction and finds that it is closely associated with unexpected earnings using a random-walk earnings expectation model. Specifically, the second hypothesis is as follows:

H2: The volume of net purchases accompanying unexpected investment income for domestic investors' valuation model is greater than that accompanying unexpected investment income for foreign investors' model.

TABLE1 Sample Selected and Persistence Indicators of Investment Income

Ticker	Firm	Persistence Indicators
2603	Evergreen Marine	1.47
2301	Lite-On Technology	1.13
1402	Far East Textile	1.05
1102	Asia Cement Corp.	0.98
2317	Hon Hai Precision	0.95
3045	Taiwan Mobile Co.	0.91
2201	Yulon Motor	0.89
2357	Asusteck Computer	0.85
2356	Inventec Corp.	0.70
2204	China Motor Corp.	0.69
1303	Nan Ya Plastic	0.66
2308	Delta Electronic	0.64
1326	Formosa Chem & Fibre	0.62
2371	Tatung Co.	0.58
2382	Quanta Computer	0.58
1301	Formosa Plastic	0.53
2002	China Steel Corp.	0.50
2303	United Microelectronics Corp.	0.36
2353	Acer Inc.	0.24
2311	Advanced Semiconductor	0.21
2342	Mosel Vitelic Inc.	0.19
2408	Nanya Technology	0.17
2324	Compal Electronic	0.11
2412	Chung Hwa Telecom	0.04
3009	Chi Mei Optoelectr	0.02
2344	Winbond Electronic	0.00
2409	AU Optronics Corp.	-0.06
2454	Mediatek Inc.	-0.11
2501	Cathay Real Estate	-0.13
2330	TSMC	-0.16
2337	Macronix International Corp.	-0.51

Note: Persistence indicators are calculated as the mean historical investment income divided by the standard deviation of historical investment income.

3. DATA

The tests of our hypotheses require data on investment income (under equity method) of each company, quarterly earnings per share (EPS), weighted average outstanding shares, daily trading summary of foreign and institutional investors, daily stock return and business cycle indicators. We collect information about companies' financial statements and foreign investors' daily trading summary in Taiwan's market by domestic market information issuers, the Taiwan Economic Journal (TEJ) Data Bank. Data on the scores of business cycle monitoring indicators are collected from Council for Economic Planning and Development, who publishes monthly statistical indicators of Taiwan's economy.

We retrieve both Taiwan and U.S. analysts' research reports data from Reuters Knowledge database to represent institutional investors' standpoints. The reason is that analysts are the primary information intermediary in the capital market. They publish research reports regularly and provide them to their clients, the institutional investors. Therefore, the research reports published serve as major sources of information publicly available to represent institutional investors' viewpoints. Moreover, analysts have the capability to influence the stock market. According to Stickel (1995) and Womack (1996), favorable changes in individual analyst's recommendation are accompanied by positive returns at the time of their announcement and vise versa. Thus the analysts' views could reflect the market behavior.

In order to measure investment income, we obtain data from the statement of cash flow rather than the income statement since TEJ Data Bank groups investment income under equity method and dividend income under cost method into one category-"investment and dividend income" on the income statement. To exclude dividend income from our measurement, we track the adjusted investment income from the statement of cash flow.

While many business cycle indicators, for example, Leading Index and Coincident Index, are available from Council for Economic Planning and Development, we choose the Monitoring Indicator as a proxy for the condition of macro economy. Although the Monitoring indicator is released with a one-month time lag, it can still reflect the general economic conditions and thus, serve as a good proxy for us to examine the influence of geneal economy on net purchases.

Our sample consists of 2,053 Taiwan Stock Exchange (TSE) firm-quarter observations from January 2001 to May 2005. The reason that we use non-probability sampling rather than random sampling is because this paper focuses

on the investment behavior of foreign investors, who tend to prefer stocks with large market capitalization and high liquidity. In other words, they are not equally interested in all of the stocks listed on the Taiwan Stock Exchange. The sample companies are the constituent stocks of the Taiwan 50 Index.

4. RESEARCH DESIGN AND MODEL

This section describes the research design to test the extent to which different investors react to the investment income component. We examine investment income per share of each company and net stock purchase of investors over a six-day ([-2, 3]) window during the period of quarterly earnings announcements. We include two days prior to earnings announcement to take into account the potential of early dissemination of information. Moreover, we extend the testing window to the third day after earnings announcement because some investors may react to the unexpected earnings laggardly.

Table 2 provides definitions of all variables used in the empirical tests. We use daily net stock purchase volume to measure investors' reaction to investment income. The main justification to use the amount of daily net purchases instead of the stock return is that the former can be identified specifically among investors while the latter cannot. Note that each trading deal can be made if and only if the two opposite parties come to an agreement. For instance, trivial stock returns do not necessarily signify investors' little reaction in the market. Rather, trivial daily returns would be documented when the two market forces-buying and selling-happen to offset each other. Consequently, stock returns may be a poor proxy for investors' perception. In contrast, the daily net purchases may fully capture investors' behavior. Or, namely, the net purchases reflect the differences among various investor groups' perceptions, while daily stock returns reflect the overall perception of the market.

Since daily net purchases are associated with market capitalization of each stock, the *NETBS* variable is modified as daily net purchases divided by average trade volume of one specific company during our testing period. It can be expressed as equation (1) as follows:

$$NETBS_{jt} = \frac{BS_{jt}}{\mu(TV_{j1}, TV_{j2}, TV_{j3}...TV_{jt}...TV_{jn})} \tag{1}$$

where

BS_{jt} = daily net purchases of company j in day t;

$\mu(TV_{j1}, TV_{j2}, TV_{j3}...TV_{jt}...TV_{jn})$ = average trade volume of company j during the testing period.

TABLE2 Variables and Definitions

Variable	Definition
NETBS	Daily net purchases on a specific stock by foreign investors
RO	Daily return of the stock, adjusted with cash and stock dividends, stock splits
ABRO	Cumulative daily abnormal return (using market model) of the stock, adjusted for cash and stock dividends, stock splits
ROYR	Cumulative return of a stock after one year
EPSO	Operating income per share
EPSE	Equity method investment income per share, calculated as (investment income/ weighted-average shares outstanding)
UEO	Unexpected operating income per share, using Foster Model
UEI	Unexpected earnings per share from investment income under equity method
BI	Monitoring indicators of the state of business cycle
BUEI	*BI* *UEI*

Observations are partitioned into two categories according to investors' nationality-domestic investors and foreign investors. We use the definition for foreign investors set by Taiwan Stock Exchange Corporation. It includes QFII (qualified foreign institutional investors), foreign juristic persons who have set up a branch office within the territory of the Republic of China, and overseas Chinese and foreign natural persons. However, QFII account for most of the trading activities of foreign investors and, in this paper, the term "foreign investors" is used interchangeably with the term "QFII". Furthermore, as we use the sign and magnitude of daily net purchases to investigate investors' perceptions, both domestic and foreign investors' reactions to unexpected investment income could be examined in one aspect. Thus, an examination of either domestic or foreign group's net purchases would be sufficient. The only difference is that they are either on the buying side or on the selling side.

We explore whether investors perceive investment income as value relevant by regressing the daily return over a 6-day window (from the two days prior to earnings announcement to the third day after the announcement) on the quarterly investment income (2):

$$RO_i = \alpha + \beta EPSE_i + \varepsilon_i \tag{2}$$

where

RO_i = daily return of the stock of company *i*;

$EPSE_i$ = investment income per share of company *i* announced.

In addition to the six-day window test, we also construct a long-windowed test to examine the firms' value associated with its investment income. We use equation (3) to investigate the firm value relevance of investment incomes.

$$ROYR_i = \alpha + \beta_1 EPSO_{ik} + \beta_2 EPSE_{ik} + \varepsilon_i \tag{3}$$

where

$ROYR_i$ = one-year cumulative stock return of company i;

$EPSE_{ik}$ = investment income per share of company i in quarter k;

$EPSO_{ik}$ = operating income per share of company i in quarter k.

If the coefficient estimate for investment income is significantly positve in the six-day window tests but significant in the long window tests, it may be that the group of investors who react more are the ones who are making mistakes.

In order to determine whether different investors have varied reactions to investment income, we regress their daily net purchases against quarterly investment income. From previous study, Bamber (1987) uses the unexpected quarterly earnings and net purchase data and finds that unexpected earnings are related to both the magnitude and duration of net purchases. In this paper, we also use the concept of *unexpected earnings* to examine investors' reactions. Basically, there are two models regarding earnings expectation: the random-walk model and the analyst forecast model. The analyst forecast model is widely used in many studies and is at least as accurate as the time-series model. This is because those analysts can apply the random-walk statistic model in their forecast and add further information to modify this model. As a result, their model may be more accurate than the time-series model. However, in Taiwan's stock market, we could only obtain forecast data on earnings per share (EPS) and pre-tax income from analysts and this research aims to examine investors' reaction to *investment income*, which is not disclosed by analysts. Therefore, the random-walk statistical model is the only choice available for this study to calculate the unexpected investment income.

We apply the Foster (1977) model to estimate quarterly operating income per share. The main advantage of using Foster model is that it can take into account the seasonal effect and has time-series properties.

We use the quarterly operating income per share to calculate $\hat{\alpha}_i$ and $\hat{\psi}_i$, which are the estimators of α_i and ψ_i respectively, from equation (4):

$$Q_{it} - Q_{it-4} = \alpha_i + \psi_i (Q_{it-1} - Q_{it-5}) \tag{4}$$

where

Q_{it} = operating income per share of company i in quarter t;

Q_{it-4} = operating income per share of company i in quarter t-4;

Q_{it-5} = operating income per share of company i in quarter t-5.

Then we substitute $\hat{\alpha}_i$ and $\hat{\psi}_i$ into equation (5):

$$E(Q_{it}) = \hat{\alpha}_i + \hat{\psi}_i(Q_{it-1} - Q_{it-5}) + \varepsilon_{it} \tag{5}$$

where

$E(Q_{it})$ = expected operating income per share of company i in quarter t;

$\hat{\alpha}_i$ = the estimation of α_i;

$\hat{\psi}_i$ = the estimation of ψ_i;

Q_{it-1} = actual operating income per share of company i in quarter t-1;

Q_{it-5} = actual operating income per share of company i in quarter t-5;

ε_{it} = residual of the operating income per share of company i in quarter t.

To eliminate the estimation bias, we use the standard deviation as a deflator in equation (6):

$$UEO_{it} = \frac{Q_{it} - E(Q_{it})}{\delta_i} \tag{6}$$

where

UEO_{it} = unexpected operating income per share of company *i* in quarter *t*;

δ_i = standard deviation of operating income per share of company *i*.

Instead of using the Foster model, we employ another method to deal with investment income per share. We assume that investment income per share is mean-reverting. The reason for that is it's common for domestic investors to forecast the growth of investment income, which means investment income is not treated as a transitory item. Thus, our assumption of mean-reversion is consistent with the notion of the "persistence" in this income component. Thus, we use equation (7) to estimate investment income per share:

$$E[QI_{it}] = \mu(QI_{i1}, QI_{i2}, QI_{i3}.....QI_{it-1}) \tag{7}$$

where

$E[QI_{it}]$ = expected investment income per share of company i in quarter t;

$\mu(QI_{i1}, QI_{i2}, QI_{i3}.....QI_{it-1})$ = mean of investment income per share of company i from quarter 1 to quarter t.

Also, we use the standard deviation as a deflator to standardize these variables in equation (8):

$$UEI_{it} = \frac{QI_{it} - E[QI_{it}]}{\delta_i} \tag{8}$$

where

UEI_{it} = unexpected investment income per share of company i in quarter t;

δ_i = standard deviation of quarterly investment income per share of company i.

We then examine foreign investors' behavior based on the following regression:

$$NETBS_{ik} = \alpha + \beta_1 UEO_{ik} + \beta_2 UEI_{ik} + \varepsilon_{ik} \tag{9}$$

where

$NETBS_{ik}$ = daily net purchases of company i in quarter k;

UEO_{ik} = unexpected operating income per share of company i in quarter k;

UEI_{ik} = unexpected investment income per share of company i in quarter k.

We include the unexpected operating income per share in the regression model in order to control the influence of ordinary earnings shock. In addition, our partitioning the earnings into operating and non-operating (investment income) components provides us with more information on the dissimilarity of investors' reactions when they face these two types of earnings.

5. RESULTS AND EXTENSION

Panel A of Table 3 presents the mean and median values of the variables used in our empirical analyses. The mean (median) values for *NETBS, UEO,* and *UEI* are 0.0241 (0.0042), -0.0162 (0.0307), and 0.2133 (0.2597), respectively. The standard deviations of these variables are 0.1055, 0.2781, and 1.1966, respectively. *BI* during January 2001 to May 2005 is from 9 to 39, with mean 22.9551 and standard deviation 9.1505. Panel B of Table 3 presents a correlation matrix for the variables used in our studies. There exists a high correlation between the two variables of BUEI and UEI. Multicollinearity diagnostics using variance inflation factors (VIF) on the dummy slope regressions model suggest that the multicollinearity is negligible given that the VIFs are less than 10.

TABLE 3 Descriptive Statistics and Correlation Matrix

Panel A: Descriptive Statistics of Variables (N=2,054)

Variable	NETBS	RO	EPSE	UEO	UEI	BI	BUEI
Mean	0.0241	-0.0362	0.2048	-0.0162	0.2133	22.9551	6.1174
Median	0.0042	0.0000	0.0541	0.0307	0.2597	26.0000	5.4369
Variance	0.1055	8.0946	0.1367	0.2781	1.1966	83.7317	762.1379
Standard	0.3248	2.8451	0.3697	0.5273	1.0939	9.1505	27.6068
Skew	-0.5493	0.0180	1.4858	-1.0549	-0.2415	-0.2808	0.3347
Kurt	18.6781	0.3824	2.3831	6.1410	0.6727	-1.1515	1.7073
Maximum	2.6198	6.9800	1.7297	2.0266	2.9986	39.0000	116.9436
Minimum	-3.4663	-6.9800	-0.6088	-2.7264	-2.9869	9.0000	-80.5271

TABLE 3 Descriptive Statistics and Correlation Matrix   Continuned

Panel B: Correlation Matrix (N=2,054)

Variable	NETBS	RO	UEO	UEI	BI	BUEI
NETBS	1.000	0.388**	-0.051*	-0.019	0.055*	-0.011
RO	0.340**	1.000	-0.009	0.032	0.030	0.033
UEO	-0.034	0.010	1.000	0.073**	0.393**	0.103**
UEI	-0.078**	0.029	0.010	1.000	0.138**	0.970**
BI	0.026	0.014	0.308**	0.118**	1.000	0.220**
BUEI	-0.094**	0.027	0.010	0.939**	0.195**	1.000

a.Panel B presents correlations among the variables defined in Table 2. Pearson (Spearman) correlations are reported above (below) the diagonal.

b.Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed).

Table 4 illustrates foreign investors' reaction to unexpected operating income and unexpected investment income, separately. It shows that the coefficient on *UEO* is positive and statistically significant at the 0.01 level, consistent with the results reported in Bamber's (1987) studies. This result is corresponding with our intuitions that investors would have a positive net purchase if the realized earnings of a company exceed their previous expectation. On the other hand, the coefficient on *UEI* is statistically significant and negative at the 0.05 level, which suggests that foreign investors' net purchase would be less when they are facing unexpected investment income. We would focus on this anomalous phenomenon in this paper and start with our first hypothesis.

TABLE 4 Test for Unexpected Operating Income and Unexpected Investment Income (N=2,054)

Model: $NETBS_{it} = \alpha + \beta_1 UEO_{it} + \varepsilon_{it}$

	α	β_1	F-value	Adj. R^2
Mean	0.036	0.206	87.118***	0.043
Standard Error	0.012	0.022		
t-value	2.968***	9.334***		

Model: $NETBS_{it} = \alpha + \beta_1 UEI_{it} + \varepsilon_{it}$

	α	β_1	F-value	Adj. R^2
Mean	0.038	-0.023	4.097***	0.002
Standard Error	0.013	0.011		
t-value	3.021***	-2.020**		

*** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Panel A of Table 5 presents the result regarding the first hypothesis. Few, if any, prior study focuses on testing the value of investment income under the equity method perceived by investors. The most related study is conducted by Swaminathan and Weintrop (1991), who regress the risk-adjusted stock returns on the earnings and revenue announcements and find that the revenue and expense components together have information content beyond that of earnings. However, in this study, we regress the 3-day stock return after earnings announcement on investment income as the first step to examine the value perceived by investors. The result confirms that stock returns are positively correlated with the quarterly unexpected investment income. As Panel B states, when investment income is more stable and persistent, it would be perceived with higher value by investors. This is consistent with our expectation that investment income of companies in Taiwan, as we mentioned in Table 1, is stable and enduring. Moreover, the results of Panel C show that operating income does serve to explain the variability of long-windowed stock returns.

TABLE5 Test Results for Value Revalence of Investment Income

Panel A: Full Sample Regression Tests with Short Windows (N=2,054)

Model: $RO_{it} = \alpha + \beta_1 EPSE_{it} + \varepsilon$

	α	β_1	F-value	Adj. R^2
Mean	-0.094	0.313	3.539**	0.001
Standard Error	0.070	0.167		
t-value	-1.335	1.881*		

Panel B: Short-Windowed Test with Companies with Stable Investment Income (N=414)

Model: $RO_{it} = \alpha + \beta_1 EPSE_{it} + \varepsilon_{it}$

	α	β_1	F-value	Adj. R^2
Mean	-0.142	0.512	3.557**	0.006
Standard Error	0.191	0.272		
t-value	-0.740	1.886*		

Panel C: Long-Windowed Test for Value Relevance of Investment Income (N=2,054)

Model: $ROYR_{it} = \alpha + \beta_1 EPSO_{it} + \beta_2 EPSE_{it} + \varepsilon_{it}$

	α	β_1	β_2	F-value	Adj. R^2
Mean	12.913	1.430	6.897	5.535***	0.004
Standard Error	1.106	0.834	2.430		
t-value	11.675***	1.713**	2.839***		

a.Companies selected with stable investment income (high persistence ratio) are: Evergreen Marine, Lite-On Technology, Far East Textile, Asia Cement Corp., Hon Hai Precision, Taiwan Mobile Co, Yulon Motor and Asusteck Computer.
b.*** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table 6 suggests the following: the net purchase by foreign investors, when we control the influence of unexpected operating income, is inversely related to the unexpected investment income. Namely, the investment income slope coefficient is -0.018, which is statistically significant at the 0.01 level. Please note that the absolute value of net purchase by domestic investors is exactly equal to the absolute value of net purchase by foreign investors. Accordingly, the net purchase slope coefficient corresponding to domestic investors is 0.018.   In summary, the results presented in Table 6 support the second hypothesis that net purchases accompanying unexpected investment income by domestic investors are greater than the net purchases accompanying investment income by foreign investors.

With the two empirical results from the first and the second hypothesis, we come to the conclusion that investment income proves to be value relevant but foreign investors seem to be less sensitive to changes in this component of earnings. Our findings are consistent with that by Bae, Stulz and Tan (2005), who document that analysts residing in a country make more precise earnings forecasts for firms in that country.

TABLE 6 The Net Purchases Accompanying Unexpected Operating Income and Investment Income (N=2,054)

Model: $NETBS_{it} = \alpha + \beta_1 UEO_{it} + \beta_2 UEI_{it} + \varepsilon_{it}$

	α	β_1	β_2	F-value	Adj. R^2
Mean	0.028	-0.017	-0.018	7.425***	0.006
Standard Error	0.007	0.011	0.005		
t-value	3.797***	-1.522	-3.525***		

*** Significant at 1%; ** Significant at 5%; * Significant at 10%.

6. ADDITIONAL TESTS

We conduct four tests to further examine the issue based on our findings. First, we explore whether the net purchases accompanying unexpected investment income by foreign investors would decrease as the general economy is boomng and vise versa. Second, we use a quadratic equation to investigate whether the result of the second hypothesis is affected by the types of regression equations. Third, we partition our sample observations from 2001 to 2005 by year in order to examine the learning effects of foreign investors. Finally, the samples are grouped into two different industries: traditional (textile, cement, plastic and steel) companies and electronic companies and would be analyzed to see if the net purchases would vary between these two industries.

We first conduct a test to examine the potential variables that would strengthen/weaken investors' reactions to unexpected investment income. The Delta research reports published by Chang, Wang and Chen, three analysts in Bear Stern, provide us an illustration that business cycle will have influence on investors' mindset when they encounter investment income. When the economy is recovering, both analysts and investors are likely to be occupied by a greater number of issues in making investment decisions. Hence, they tend to overlook the non-operating section in financial statements and treat these items as transitory revenues or expenses. However, the investment income component may not be as temporary as being perceived.

We construct two different models to control the influence of economic cyclical factors on the net purchases. First, we use the first-order polynomial model with an interaction item as follows:

$$NETBS_{ik} = \alpha + \beta_1 UEO_{ik} + \beta_2 UEI_{ik} + \beta_3 BI_k + \beta_4 BUEI_{ik} + \varepsilon_{ik}$$

(10)

where

$NETBS_{ik}$ = daily net purchases of company i in quarter k;

UEO_{ik} = unexpected operating income per share of company i in quarter k;

UEI_{ik} = unexpected investment income per share of company i in quarter k;

$BUEI_{ik}$ = business cycle indicator in quarter k multiplied by the unexpected investment income per share of company i in quarter k;

BI_k = business cycle indicators in quarter k.

In this equation, the slope of the unexpected investment income depends on the value of the business cycle indicators. Holding the UEI constant, the overall net purchase coefficient would be $(\beta_2 + \beta_4 \times BI)$ instead of β_2, which indicates that the net purchase accompanying unexpected investment income would increase or decrease in an accelerated rate comparing with the change rate of the unexpected investment income.

The second model incorporates dummy variables to represent varied stages of the economic conditions measured by the Monitoring Indicators, which are on an interval scale. Then we model the relation between unexpected investment income per share, operating income per share, cyclical factors and daily net purchases as follows:

$$NETBS_{ik} = \alpha + \beta_1 UEO_{ik} + \beta_2 UEI_{ik} + \beta_3 BI_k + \beta_4 D_1 UEI_{ik} + \beta_5 D_2 UEI_{ik} + \beta_6 D_3 UEI_{ik} + \beta_7 D_4 UEI_{ik} + \varepsilon_i$$

(11)

where

$NETBS_{ik}$ = daily net purchases of company i in quarter ;

UEO_{ik} = unexpected operating income per share of company i in quarter k;

UEI_{ik} = unexpected investment income per share of company i in quarter k;

BI_k = business cycle indicators in quarter k;

D_1 = 1 if the business cyclical indicator scores 16 to 25 points, otherwise =0;[3]

D_2 = 1 if the business cyclical indicator scores 26 to 30 points, otherwise =0;

D_3 = 1 if the business cyclical indicator scores 31 to 35 points, otherwise =0;

D_4 = 1 if the business cyclical indicator scores above 35 points, otherwise =0.

where D_i is a "dummy slope" variable and the model is similar to the previous first-order polynomial interaction model. The dummy slope model can clearly express the difference of net purchases in various economic conditions. With this model, we could compare the net purchases in varied phases of the economy directly and test whether foreign investors' net purchases accompanying unexpected investment income would decrease as the general economy is turning around.

Table 7 provides the results of Models and II, which are used to test the relationship between business cycles and net purchases triggered by unexpected investment income. The result in Model I is in contrast to our intuition. Namely, the unexpected operating income component is not statistically significant at the 0.1 level. The result suggests that, given the same level of unexpected investment income, there are two different factors that would affect the sign and magnitude of the net purchases. The first variable is business cycle, which is positively related to net purchases by foreign investors. However, when we consider the interaction between the business cycle and investors' reaction to unexpected investment income, we find it has a significantly negative effect on the daily net purchases by foreign investors. Thus, the influence of business cycle on the daily net purchases appears to be mixed, but this result could lend support to our hypothesis that foreign investors' net purchases accompanying unexpected investment income would decrease as the general economy is improving.

In Model II, the observations are classified into five categories by the magnitude of the business cycle indicators. The results reported in Table 7 suggest that the net purchases accompanying unexpected investment income are negatively associated with the state of the business cycle. When the cyclical indicator is between 26 and 30 points and above 35 points, the net purchases accompanying unexpected investment income are -0.044 and -0.183, respectively (at the 1% level). This finding is consistent with our prior results that foreign investors' net purchases

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[3] We classify the cyclical indicators by its magnitude into five categories. The first group is from 9 to 15 points and followed by 16 to 25, 26 to 30, 31 to 35 points. Observations that are with 36 points and above are classified as the last category.

accompanying unexpected investment income would decrease with the value of business cycle indicator. Nevertheless, according to Table 7, the net daily purchases are statistically insignificantly affected by unexpected investment income when the business cycle indicator falls in the range of 31 to 35 points or below 26 points.

TABLE7   Regression Analyses for Business Cycle and Net Purchase accompanying Unexpected Investment Income (N=2,054)

Model 1: $NETBS_{it} = \alpha + \beta_1 UEO_{it} + \beta_2 UEI_{it} + \beta_3 BI_{it} + \beta_4 BUEI_{it} + \varepsilon_{it}$

	α	β_1	β_2	β_3	β_4	F-value	Adj. R^2
Mean	-0.028	-0.028	0.028	0.003	-0.002	7.852***	0.013
Standard Error	0.021	0.012	0.015	0.001	0.001		
t-value	-1.338	-2.396***	1.930*	3.001***	-3.413***		
VIF		1.113	8.818	1.202	9.058		

Model 2: $NETBS_{it} = \alpha + \beta_1 UEO_{it} + \beta_2 UEI_{it} + \beta_3 BI_{it} + \beta_4 D_1 UEI_{it} + \beta_5 D_2 UEI_{it} + \beta_6 D_3 UEI_{it}$
$+ \beta_7 D_4 UEI_{it} + \varepsilon_{it}$

	α	β_1	β_2	β_3	β_4	F-value	Adj. R^2
Mean	-0.036	-0.023	-0.008	0.003	-0.003	11.708***	0.038
Standard Error	0.022	0.015	0.013	0.001	0.019		
t-value	-1.691*	-1.571	-0.588	3.620***	-0.163		
	β_5	β_6	β_7				
Mean	-0.044	-0.023	-0.183				
Standard Error	0.018	0.021	0.28				
t-value	-2.409**	-1.081	-6.479***				

*** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table 8 presents the regression results by using a quadratic equation. The coefficient of unexpected investment income on net purchase, β_2, is still negative. These findings prove that the result of our second hypothesis test is robust against alternative regression equations. Foreign investors tend to underreact to investment income. Furthermore, the coefficient of UEI^2, 0.003, indicates that the regression curve is a concave function of unexpected investment income. Our explanation is that domestic investors would take less notice of the unexpected investment income when it becomes an extreme value.

TABLE 8 Regressing Net Purchase accompanying Unexpected Investment Income with Quadratic Equations (N=2,054)

Model: $NETBS_{it} = \alpha + \beta_1 UEO_{it} + \beta_2 UEI_{it} + \beta_3 UEO^2_{it} + \beta_4 UEI^2_{it} + \varepsilon_{it}$

	α	β_1	β_2	β_3	β_4	F-value	Adj. R^2
Mean	0.026	-0.015	-0.021	-0.007	0.003	4.776***	0.007
Standard Error	0.008	0.011	0.006	0.004	0.002		
t-value	3.215***	-1.323	-3.806***	-1.603	1.532		

*** Significant at 1%; ** Significant at 5%; * Significant at 10%.

According to the results of Table 9, in 2001 and 2002, foreign investors are not sensitive to unexpected investment income. Thus the statistic β_2 is not significant at 0.01 level during the two years. However, such phenomenon changes dramatically after 2003. The net purchases by foreign investors are negatively associated with unexpected investment income. One plausible explanation for such phenomenon is the bounded rationality of the investors, who tend to ignore investment income, especially when this item has less contribution to net earnings. However, as time goes by, domestic investors who possess better comprehension of the business practices of companies in Taiwan, have learned to take investment income into account when making investment decisions. On the other hand, foreign investors may keep their original viewpoints towards investment income. Thus the net purchase accompanying investment income becomes statistically significant after 2003. From this explication, we conclude that there is a learning effect among domestic investors. The alternative explanation is that investors may have reacted to investment income before 2003, but their reactions are relatively weak and are influenced by noise. Therefore, it cannot be tested by our statistical method.

Last, we examine the influence on net purchases by industry. Based on the results presented in Table 1 showing the persistence indicators in traditional companies are significantly higher, we conjecture that, in Taiwan's market, the cross-holding phenomenon is more common among traditional companies than electronic companies. The persistence indicator in Table 1 is measured by each sample company's mean historical investment income per share deflated by its standard deviation. Specifically, the greater the ratio is, the higher degree of persistence in investment income is. Since many of our sample companies have stable and persistent investment income and most of them are concentrated in the traditional sector, we divide our samples into two categories, one for electronic companies and the other for traditional companies. Table 10 presents a robust result of the behavior of foreign investors on these two groups. Traditional companies have relatively persistent investment income. The foreign investors, nevertheless, underreact to investment income.

TABLE9 Test for the Learning Effect (N=2,054)

Model: $NETBS_{it} = \alpha + \beta_1 UEQ_{it} + \beta_2 UEI_{it} + \varepsilon_{it}$

2001 (N=492)	α	β_1	β_2	F-value	Adj. R^2
Mean	-0.015	-0.031	0.000	1.005	0.000
Standard Error	0.014	0.022	0.009		
t-value	-1.103	-1.401	-0.025		
VIF		1.108	1.108		
2002 (N=456)	α	β_1	β_2	F-value	Adj. R^2
Mean	-0.009	-0.002	-0.005	0.284	-0.003
Standard Error	0.010	0.016	0.007		
t-value	-0.858	-0.143	-0.722		
VIF		1.009	1.009		
2003 (N=475)	α	β_1	β_2	F-value	Adj. R^2
Mean	0.086	-0.027	-0.040	6.149***	0.021
Standard Error	0.018	0.022	0.011		
t-value	4.857***	-1.239	-3.506***		
VIF		1.121	1.121		
2004 (N=523)	α	β_1	β_2	F-value	Adj. R^2
Mean	0.077	-0.067	-0.039	6.170***	0.019
Standard Error	0.021	0.034	0.015		
t-value	3.627***	-1.954**	-2.649***		
VIF		1.016	1.016		
2005 (N=108)	α	β_1	β_2	F-value	Adj. R^2
Mean	-0.041	-0.537	-0.044	12.851***	0.181
Standard Error	0.030	0.126	0.015		
t-value	-1.370	-4.278***	-2.901***		
VIF		1.002	1.002		

*** Significant at 1%; ** Significant at 5%; * Significant at 10%.

TABLE10 The Net Purchases accompanying Unexpected Investment Income in Different Industries (N=2,054)

Model: $NETBS_{it} = \alpha + \beta_1 UEO_{it} + \beta_2 UEI_{it} + \varepsilon_{it}$

Traditional (N=420)	α	β_1	β_2	F-value	Adj. R^2
Mean	0.024	-0.102	-0.318	23.187***	0.096
Standard Error	0.021	0.018	0.092		
t-value	1.127	-5.711***	-3.467***		
Electronic (N=1,295)	α	β_1	β_2	F-value	Adj. R^2
Mean	0.026	0.003	-0.004	0.223	-0.001
Standard Error	0.008	0.006	0.010		
t-value	3.402***	0.503	-0.435		

a.*Note*: The "traditional" group consists of Far East Textile, Asia Cement Corp., Nan Ya Plastic, Formosa Chem & Fibre, Formosa Plastic and Formosa Plastic. The "electronic" consists of Lite-On Technology, Hon Hai Precision, Asusteck Computer, Inventec Corp., Delta Electronic, Quanta Computer, United Microelectronics Corp., Acer Inc., Advanced Semiconductor, Mosel Vitelic Inc., Nanya Technology, Compal Electronic, Chi Mei Optoelectr, Winbond Electronic, AU Optronics Corp., Mediatek Inc., TSMC and Macronix International Corp..
b.*** Significant at 1%; ** Significant at 5%; * Significant at 10%.

7. SUMMARY AND CONCLUSION

This paper aims to investigate the difference in reactions between domestic and foreign investors to reported investment income. We find that, in Taiwan's stock market, the quarterly investment income is value relevant. Moreover, using the Foster model to calculate unexpected earnings, the empirical study result implies that domestic investors' net purchases accompanying unexpected investment income, in terms of net daily purchases, are greater than that accompanying foreign investors'. Thus, foreign investors may misinterpret investment income because of different business practices followed by firms in Taiwan. There are few, if any, studies that directly examine such relation. Furthermore, we conclude that foreign investors' net purchase volume is negatively related to business cycle. Namely, the net purchases accompanying unexpected investment income made by foreign investors would decrease as the general economy turns around and vise versa.

These results bear on several topics raised in prior research. First, Swaminathan and Weintrop (1991) suggest that the reported revenues and expenses have information content in addition to earnings. This study further decomposes the revenue into operating and non-operating components and focuses on the information revealed in investment income. Second, the research conducted by Bradshaw, Bushee and Miller (2004) shows that U.S. investors, when selecting their portfolio, prefer the shares of the firm with accounting methods conforming to the U.S. GAAP because of stronger familiarity with these methods. Thus these

investors tend to heavily weigh domestic assets in their portfolio. In contrast, this paper provides evidence that investors misinterpret the accounting component when the companies they face in foreign markets have a different business practice compared with those in their home market.

Another implication from this paper is that investors should pay more attention or, in other words, be more sophisticated when they valuate companies which report investment income under the equity method. The results may benefit the real world practitioners who have the knowledge that investment income reported by companies may be a permanent component instead of a transitory item in some markets.

REFERENCES

Ball, R., and P. Brown. 1968. An empirical evaluation of accounting income numbers. *Journal of Accounting Research 6*: 159-178.

Bae, K. H., R. M. Stulz, and H. Tan. 2005. Do local analysts know more? A cross-country study of the performance of local analysts and foreign analysts. Working Paper, National Bureau of Economic Research.

Bradshaw, M. T., B. J. Bushee, and G. S. Miller. 2004. Accounting choice, home bias, and U.S. investment in non-U.S. firms. *Journal of Accounting Research* 42: 795-841.

Bamber, L. S. 1987. Unexpected earnings, firm size, and trading volume around quarterly earnings announcements. *Journal of Accounting Review* 57: 510-532.

Chang, K., and K. Wang. 2001. Delta electronics: In the midst of recharging growth. *Credit Suisse First Boston Equity Research*.

Fairfield, P. M., R. J. Sweeney, and T. L. Yohn. 1996. Accounting classification and the predictive content of earnings. *The Accounting Review* 71: 337- 355.

Foster, G.. 1977. Quarterly accounting data: Time-series properties and predictive ability results. *The Accounting Review* 52: 1-12.

Lev, B. 1989. On the usefulness of earnings and earnings research: Lessons and directions from two decades of empirical research. *Journal of Accounting Research* 27: 153-191.

Lipe, R. C. 1986. Information contained in the components of earnings. *Journal of Accounting Research* 24: 37-64.

Lin, Y. 2005. 1Q05 operating summary of TSMC. *Taiwan International Securities Groups Research Report.*

Stickel, S. E. 1995. The anatomy of performance of *Buy and Sell* recommendations. *Financial Analysts Journal* 51: 25-39.

Swaminathan, S., and J. Weintrop. 1991. The information content of earnings, revenues, and expenses. *Journal of Accounting Research* 29: 418-427.

Womack, K. 1996. Do brokerage analysts' recommendation have investment value? *Journal of Finance* 51: 137-167.

Wong, R., and J. Tse. 2005. IC foundries 1Q05 earnings preview: Low expectations for 2Q; focus on 3Q recovery for TSMC, UMC and chartered Semi-conductor. *Bear Stearn Equity Research*.