Institutional Ownership, Income Smoothing and the Value-relevance of Accounting Numbers

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Abstract

The active monitoring hypothesis provides evidence that firms with higher institutional ownership are less likely to manage earnings, which in turn, enhances the value-relevance of accounting numbers. Yet, recent studies also highlight the importance of explicitly considering the short-term oriented investing behavior of institutional investors (the myopia hypothesis) when investigating the association between institutional ownership and managerial earnings reporting. Thus, the role of institutional investors in managerial earnings reporting remains an open question. Based on the informative association between income smoothing and the value-relevance of financial reporting, this study uses the unbalanced-panel data regressions to examine the monitoring or myopia role of institutional investors on the association between income smoothing and the value-relevance of accounting numbers. The empirical results to some extent support the monitoring hypothesis that the higher institutional ownership is, income smoothing generates more value-relevance of both earnings and equity book value. Moreover, in the income smoothing with higher institutional ownership/lower ownership volatility case, it reveals that the increasing value-relevance of earnings is enhanced. However, in the income smoothing with lower institutional ownership/higher ownership volatility case, it is found that the increasing value-relevance of earnings is mitigated. This study also documents that the role of institutional ownership on the association between income smoothing and the value-relevance of equity book value is unobvious in the analysis, both in the high and low ownership volatility cases. We demonstrate some diagnostic checks and evidence the results are robust to the various specifications.

Keywords: Institutional Ownership, Income Smoothing, Value-Relevance, Monitoring Hypothesis, Myopia Hypothesis

1. Introduction

Accounting standards can provide a credible mean for managers to communicate their operating performance to stakeholders and capital market participants. To allow managers effectively convey their firms’ operating information, accounting standards permit managers to exercise judgment and/or accounting choices in earnings reporting. Consequently, Healy and Wahlen (1999) argued that managers can use their knowledge about the business and its opportunities to select reporting methods, estimates, and disclosures that do not adequately reflect their firms’ underlying economics. Prior studies have been examining whether firms engage in accruals-based earnings management to artificially manipulate their current earnings and have suggested that it does take place. In the value-relevance characteristic of financial reporting perspective, Barth, Beaver, and Landsman (2001) suggest that particular accounting amounts reflect information that is used by investors in valuing firms’ equity; thus, value relevance research can be used to study its implications for the relation between accounting amounts and equity values. This study follows this stream of research (Fan, Chen, and Liao 2008; Hunt, Moyer, and Shevlin 2000; Marquardt and Wiedman 2004) and investigates the role of institutional investors on the value-relevance of managerial earnings reporting, i.e., income smoothing.

Institutional investors are characterized in academic research as sophisticated investors who are

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presumably interested in and are capable of using all types of value-relevant financial information to establish and evaluate their investments. Bushee (1998) highlighted the importance of explicitly considering the short-term oriented trading behavior of institutional investors (the myopia hypothesis) when investigating the association between institutional ownership and managerial earnings reporting. The short-term oriented trading behavior of institutional investors, which are overly focused on short-term earnings, reduces the stock prices reflect more current earnings information that is predictive of future earnings. However, prior studies (Bartov, Radhakrishnan, and Krinsky 2000; Jiambalvo, Rajgopal, and Venkatachalham 2002) have provided evidence that institutional investors are better monitors of managerial opportunistic earnings reporting (denoted as the monitoring hypothesis), in turn, stock price can reflect more future earnings information. For example, Jiambalvo, Rajgopal, and Venkatachalham (2002) find that the extent to which stock prices lead earnings is positively related to the percentage of institutional ownership. It suggested that stock prices reflect more current earnings information that is predictive of future earnings when institutional ownership increases. Nevertheless, institutional investors play an important role in explanation the value-relevance of accounting numbers has documented by both the myopia and the monitoring hypotheses. From earnings reporting perspective, if institutional investors are better monitors of managerial opportunistic earnings reporting, the quality of earnings enhances with the increases in the magnitude of institutional ownership. However, the short-term trading strategies weaken the monitoring role of institutional investors in managerial earnings reporting. Incorporating institutional investors’ trading strategies into analysis, the role of institutional investors in managerial earnings reporting remains an open question. This study is motivated to use both the institutional ownership and the shareholdings volatility in examining the monitoring or the myopia role of institutional investors on the association between managerial earnings reporting and value-relevance of accounting numbers, which can shed some insights in enriching the stream of managerial earnings reporting research.

Extant studies document that the underlying motivation for managers’ income smoothing behavior is to communicate private information about future earnings (Hunt, Moyer, and Shevlin 2000; Tucker and Zarowin 2006). This hypothesis suggests that income smoothing can improve the forecasting capability of current earnings, while at the same time, is consistent with the explanations that discretionary earnings smoothing increases the informativeness of earnings. Fan (2009) further examines the effect of income smoothing on the relative value-relevance changes of accounting numbers and reveals managerial income smoothing can improve (weaken) the relative value-relevance of earnings (equity book value). We note that the analytical explanations suggested by Fudenberg and Tirole (1995) and Arya, Glover, and Sunder (1998) reveal that managers may seek to temporarily deceive investors by opportunistically manipulating accounting numbers. The implication from their theory suggests that when current earnings performance is poor, managers have an incentive to shift future earnings into the current period in order to decrease the possibility of dismissal. Thus, there are two competing views, i.e., informativeness versus opportunism, of income smoothing as far as the value-relevance of accounting numbers is concerned and call for further examinations. Incorporating the role of institutional investors into managerial income smoothing reporting, Kwak, Lee, and Mande (2009) find that Japanese institutional owners take a long-term view on bank performance, thus, as the percentage of institutional ownership of banks increases, income smoothing via loan loss provisions increases. Alternatively, Chung, Firth, and Kim (2002) argue that institutional investors do not desire opportunistically income smoothing as these techniques can obfuscate the underlying trends and profitability of

\textsuperscript{1}Fudenberg and Tirole (1995) defined managerial “income smoothing” behavior is the process of manipulating the time profile of earnings or earnings reports to make the reported income stream less variable. Graham, Harvey, and Rajgopal (2005) also find that an overwhelming 96.9\% of the survey respondents indicate that they prefer a smooth earnings path and such strong enthusiasm among managers for smooth earnings is perhaps not reflected in the academic literature. In the informative income smoothing school, Subramaniam (1996) find that discretionary accruals may communicate information about future benefits. Hunt, Moyer, and Shevlin (2000) document the price-earnings relation is positively associated with income smoothing measure. Recently, Tucker and Zarowin (2006) argue that managers use their discretion to communicate their assessment of future earnings and document strong evidence on the positive association between income smoothing and earnings informativeness. The argument of managerial using income smoothing to communicate future performance is also supported in other related studies, e.g., Chaney and Lewis (1995), Sankar and Subramaniam (2001), and Kirschenheiter and Melumand (2005). However, in the opportunism income smoothing school, Fudenberg and Tirole (1995) and Arya, Glover, and Sunder (1998) reveal that managers may seek to temporarily deceive investors by opportunistically manipulating accounting numbers. Thus, it is expected that the informative (opportunistic) income smoothing enhances (deteriorates) earnings quality or earnings reporting.
that the coefficient of INST (INST2) is negative (positive)
ship and income smoothing decision. The result reveals
understand the association between institutional owner-
2This study follows Koh (2003) and regresses the income
smoothing patterns.2 The empirical findings of Hunt, Moyer, and Shevlin (2000), Tucker and Zarowin
(2006) and Fan (2009) provides this study an opport-
unity to further examine the role of institutional in-
vestors on the value-relevance of managerial income
smoothing decision. In sum, if institutional investors
are better monitors of managerial opportunistic earn-
ings reporting, the value-relevance of earnings for
firms with income smoothing improves with the in-
creases in the magnitude of institutional ownership.
Alternatively, the short-term trading strategies weak-
en the monitoring role of institutional investors in
managerial earnings reporting, which in turn, will get
worse the value-relevance of earnings with income
smoothing. Institutional investors are sophisticated
investors with advantages in acquiring and processing
information and spend more time performing invest-
ment analysis to protect their magnitude of wealth
invested (Shiller and Pound 1989). Together with in-
stitutional investors and their trading strategies with
managerial income smoothing on earnings reporting,
this study can provide evidence to understand insti-
tutional ownership and shareholdings volatility in the
value-relevance of managerial income smoothing de-
cision.

This study follows related value-relevance re-
search and expresses the stock price as a linear func-
tion of earnings and equity book value, in turn, uses
the unbalanced-panel regressions to examine the mon-
itoring or myopia role of institutional investors on the
association between income smoothing and the value-
relevance of accounting numbers. The years 2001 ~
2012 were chosen as the observation periods. The
sample firms used in this study are composed of
publicly traded companies listed on the Taiwan Stock
Exchange and OTC Securities Market. The empirical
results to some extent support the monitoring hy-
pothesis that the higher institutional ownership is,
income smoothing generates more value-relevance of
both earnings and equity book value. Moreover, in the
income smoothing with high institutional ownership
and lower shareholdings volatility case, it reveals that
the increasing value-relevance of earnings is en-
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tutional ownership and higher shareholdings volatility
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the role of institutional investors on the association
between income smoothing and the value-relevance
of equity book value is unobvious, both in the high
and low shareholdings volatility cases. These findings
support the conjecture that institutional investors play
an important role in explaining managerial income
smoothing on the value-relevance of accounting num-
bers, specifically, for firms with high institutional own-
ership and low shareholdings volatility case.

To the best of our knowledge, only Yu (2013)
documents that institutional ownership affect the val-
ue relevance of disclosed information as well as the
valuation difference between disclosed and recog-
nized information. This study extends the very limited
research on the association between managerial in-
come smoothing and the value-relevance of account-
ing numbers. Particularly, we incorporate the role of
institutional ownership into consideration to examine
managerial distinctive income smoothing motives in
order to provide some insights in enriching the in-
stitutional ownership research. Secondly, prior studies
(Barth, Beaver, and Landsman 1998; Collins, May-
dew, and Weiss 1997; Francis and Schipper 1999)
have aimed at specifying the conditions under which
earnings or equity book values would either be as-
signed a relatively higher weight in explaining stock
values. This study extends this stream of research and
further examines the role of institutional investors in
the association between managerial earning reporting
and the value-relevance tradeoffs beyond earnings and
equity book values under income smoothing behav-
iors.3 Finally, we note that Holthausen and Watts

2There are fruitful studies discuss whether the value
relevance literature provides insights for standard setting
and/or particular accounting amounts reflect information
that is used by investors in valuing firms’ equity (Barth,
Beaver, and Landsman 2001; Holthausen and Watts
2001). However, Scott (2012) argues that the measure-
ment approach is reinforced by the development of the
Ohlson (1995) clean surplus framework, which empha-
sizes the fundamental role of accounting information in
determining firm value. Thus, this framework implies a
more basic role for financial reporting on firm value than
information approach, which views accounting inform-
ation as one of many information sources competing for
the attention of the efficient market. Not that the pro-
gressive application of fair value accounting in financial
reporting enhances the usefulness of accounting numbers.
The measurement approach to some extent reinforces the
association between stock price and accounting inform-
ance. Recently, plenty of studies use the value-relevance

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3This study follows Koh (2003) and regresses the income
smoothing (IS) by two institutional ownership variables
(INST and INST2) and related explanatory variables to
understand the association between institutional own-
ership and income smoothing decision. The result reveals
that the coefficient of INST (INST2) is negative (positive)
and statistically significant. This finding to some extent
supports the argument that institutional ownership is as-
associated with managerial income smoothing behaviors.
(2001) argued the value-relevance research offers little or no insight for standard setting, i.e., it is mere association. Yet, Barth, Beaver, and Landsman (2001) claimed another view that value relevance studies are designed to assess whether particular accounting numbers reflect information that is used by investors in valuing firms’ equity. They suggested that value relevance research provides insights into questions of interest to standard setters and other non-academic constituents, which in turn, can be used to operationalize key dimensions of the FASB’s theory to assess the relevance and reliability of accounting information. Institutional investors are sophisticated investors and are capable of using all types of value-relevant information to monitor earnings reporting and/or engage in trading. By way of institutional investors trading strategies can reveal information to assist individual investors in making a clear understanding of managerial income smoothing motives under information asymmetry. Our empirical findings support that institutional investors play an important role in explaining managerial income smoothing on the value-relevance of accounting numbers, specifically, for firms with high institutional ownership and low shareholdings volatility case. This finding should be of interest to the Securities and Futures Bureau (SFB) of Taiwan, in its ongoing initiative against strategic earnings reporting (i.e., accruals-based earnings management) and its concern with the roles of institutional investors in the Taiwan securities markets.

This paper is organized as follows: Section 2 describes the related studies and develops the empirical hypotheses. Section 3 presents the empirical design. Section 4 presents and discusses the empirical results. Section 5 presents the robustness test and Section 6 concludes the study.

2. Related Research and Hypotheses

2.1 Related Research

Ohlson (1995) expresses stock price as a linear function of book value of equity and abnormal earnings. Subsequently, a couple of studies aimed at specifying the conditions under which equity book value or earnings variable would be assigned a relatively higher weight in explaining stock value or would explain a relatively higher proportion of the market value of the equity (Bhattacharya, Demers, and Joos 2010; Burgstahler and Dichev 1997; Collins, Maydew, and Weiss 1997; Collins, Pincus, and Xie 1999; Francis and Schipper 1999). For example, Barth, Beaver, and Landsman (1998) suggest that a fundamental role of income statement whereas is for equity valuation, a distinctive role of balance sheet is to facilitate loan decisions and monitoring of debt contracts. Ou and Sepe (2002) find that the larger the spread between analysts’ forecasts of a firm’s future earnings and reported current earnings, the less value-relevant current earnings and the more the market relies on book value for equity valuation. Thus, it is fair to conclude that there is a complementary relationship between earnings and book value of equity in determining stock price, i.e., book value of equity is more value-relevant in determining stock price when the relative value-relevance of earnings decreases, vice versa. There are studies in this stream to examine the presence of earnings management is another factor that affects the valuation role of accounting numbers, e.g., Fan, Chen, and Liao (2008), Fan and Chen (2013), Marquardt and Wiedman (2004) and Ou and Sepe (2002).

As for the analytical analysis of managerial income smoothing, Fudenberg and Tirole (1995) model managerial earnings management behavior and suggest that concern about job security creates an incentive for managers to smooth earnings. The implication from their theory suggests that when current earnings performance is poor, managers have an incentive to shift future earnings into the current period in order to decrease the possibility of dismissal. Arya, Glover, and Sunder (1998) also documented that managers sometimes find earnings management (i.e., income smoothing) useful as a way of limiting owner intervention and eliminating from the threat of dismissal. There are two analytical studies discuss the informative hypothesis of income smoothing. Chaney and Lewis (1995) model managers of high-type firms can reduce the noise in these reports by smoothing reported earnings around the “expected” earnings report, thereby allowing investors to increase the accuracy of their assessment of firm value. Kirschenheiter and Melumad (2005) also show that a credible equilibrium exists where, compared to earnings reported without discretion, better informed managers’ report smoother earnings by smoothing the transitory component when news is good and report earnings that accentuate the intertemporal differences when
news is bad, which in turn, results in smoother earnings being of higher quality. Extant empirical studies also documented that managerial income smoothing is positively associated with earnings informativeness. Hunt, Moyer, and Shevlin (2000) documented that the price-earnings relation is positively associated with income smoothing. Recently, Tucker and Zarowin (2006) have shown strong evidence on the positive association between income smoothing and earnings informativeness. Based on emerging capital market data, Fan (2009) examines the effect of income smoothing on the relative value-relevance changes of accounting numbers and reveals managerial income smoothing improve the relative value-relevance of earnings. According to above discussions, it is fair to conclude that income smoothing, to some extent, is one way for managers to communicate private information and support the notion that income smoothing could enhance earnings informativeness and/or value-relevance of accounting numbers.

As for the institutional ownership literature, it is the belief that institutions are likely to actively manage and/or protect their wealth invested. If institutional investors are better monitors of opportunistically managed earnings reporting, the quality of earnings will be enhanced with the increase in the level of institutional ownership. Supporting this point of view, extant studies have provided evidence that firms with high institutional ownership are less likely to manage earnings (Bushee 1998; Chung, Firth, and Kim 2002; Jiambalvo, Rajgopal, and Venkatachalam 2002; Lim, Ding, and Charoenwong 2013). However, recent studies also highlight the importance of explicitly considering the short-term oriented trading behavior of institutional investors when investigating the association between institutional ownership and managerial earnings reporting (Bushee 2001; Kim 1993). For example, Bushee (2001) indicated that transient institutions prefer near-term earnings over long-run value raises the question of whether such institutions myopically price firms. Thus, there are two competing perspectives, i.e., monitoring vs. myopic hypothesis, to describe the role of institutional investors on managerial earnings reporting. Incorporating trading strategies into consideration, Koh (2003) and Hsu and Koh (2005) evidenced that transient and long-term oriented institutions co-exist and have differential effects on portfolio firms’ earnings management. Transient institutions are associated with upward accruals management, while long-term oriented institutions constrain such upward accruals management for portfolio firms that have strong incentives to do so (specifically, firms with non-discretionary earnings below prior year earnings). This finding is again supported by Lin and Manowan (2012). Accordingly, the competing views on how institutional ownership associated with managerial earnings reporting is not mutually exclusive among firms and, on average, are conditional on institutional investors’ trading strategies. We note that institutional investors are characterized as sophisticated investors who are presumably interested in and are capable of using all types of value-relevant financial information to establish and evaluate their investments (Bartov, Radhakrishnan, and Krinsky 2001; Jiambalvo, Rajgopal, and Venkatachalam 2002; Shiller and Pound 1989). Therefore, it is fair to conclude that long-term oriented institutions can act as a corporate governance mechanism to mitigate aggressive earnings management, yet, some short-term investing horizons institutional investors do not. Based on the empirical findings of Tucker and Zarowin (2006) and Fan (2009), this study conjectures long-term versus short-term institutional investors play distinctive roles in the association between income smoothing and the value-relevance of accounting numbers. The empirical findings of this study will shed some insights in both the value-relevance and strategic earnings reporting streams of research.

2.2 Hypotheses

Agency framework demonstrates that managers have incentives to present low variance income streams in raising compensation and/or in reducing the firm’s long-term cost of capital. Income smoothing plays a dual role in determining the quality of earnings, i.e., garbling or efficient communication of private information (Tucker and Zarowin 2006). However, the motives of managers’ income smoothing decision are unobservable. Investors are unlikely to effectively discriminate the garbling or communicating private information component of income smoothing. Institutional investors are characterized as sophisticated market participants, which in turn, can result in varying monitoring abilities with which to constrain self-serving managerial behavior (Bushee 1998; Hadani, Goranova, and Khan 2011). It is expected the presence of institutional investors can gain a better understanding of managerial income smoothing behavior and reduce the degree of information asymmetry.

We note that there are two competing perspectives, i.e., monitoring vs. myopic hypothesis, to describe the role of institutional investors in managerial earnings reporting. In the monitoring school, prior studies have provided evidence that firms with higher institutional ownership are less likely to manage earnings (Bushee 1998; Chung, Firth, and Kim 2002; Edmans 2009; Hadani, Goranova, and Khan 2011; Jiam-
Let us turn to discuss whether the institutional ownership is associated with value-relevance of equity book value for firms with income smoothing. Naturally, this study firstly describes the influences of managerial income smoothing on the relative value-relevance of equity book value. Fudenberg and Tirole (1995) note that income smoothing is the process of manipulating the time profile of earnings or earnings reports to make the reported income stream less variable while not increasing reported earnings over the long run. Consequently, long-run cumulative earnings closely approximate long-run cumulative cash flows and are more difficult to manipulate in the income smoothing case. Thus, managerial income smoothing should result in a more correct equity book value carrying amount because faithful representations and/or relative conservatism reporting. Although conservatism reporting may result mispricing, yet, Balachandran and Mohanram (2011) find no evidence that firms with increasing conservatism exhibit greater declines in value relevance. Based on Fudenberg and Tirole (1995), it is expected that income smoothing enhances the value-relevance of equity book value. However, in the Ohlson (1995) framework, extant studies revealed when a firm’s current earnings is not perceived to be a good indicator of future earnings, e.g., due to a large transitory component in current earnings, a change in the firm’s future prospects, or earnings with noisy, market participants will likely turn to book value of equity for guidance in stock valuation (Fan, Chen, and Liao 2008; Fan 2009; Fan and Chen 2013; Barth, Beaver, and Landsman 1998; Burgstahler and Dichev 1997; Collins, Maydew, and Weiss 1997; Marquardt and Wiedman 2004; Ou and Sepe 2002). It implies that the pricing multiple on and the incremental explanatory power of equity book value is conditional on and/or traded-off by the investors’ perceived weight of current earnings in the Ohlson (1995) setting (denoted as model substitute effect). Thus, the association between income smoothing and value-relevance of equity book value is indefinite.

We now discuss the role of institutional investors on the value-relevance of equity book value for firms with smoothed earnings. Intuitively, the quality of financial reporting should be positively (negatively) associated with monitoring hypothesis (myopic hypothesis) of institutional investors, which in turn, improves (deteriorates) the value-relevance of equity book value. However, prior studies (Burgstahler and Dichev 1997; Collins, Pincus, and Xie 1999) documented that the equity book value generally serving as a value-relevant measure for loss firms rather than profitability firms. It is unlikely to see institutional investors, as sophisticated investors, bring negative earnings firms into their investing portfolio. Thus, the valuation role of equity book

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value for the institutional investors may be unremarkable. Moreover, in the Ohlson (1995) framework, we can view stock holder equity in a company as an option on the residual assets of the company (Merton 1974), i.e., equity holders are assumed to default if the market value of the assets is lower than the book value of the firm’s liabilities. In the information asymmetry setting, investors use limited information to determine the market value of underlying assets, which in turn, result different pricing multiple on equity book value and earnings in their valuation. Yet, sophisticated and skilled institutional investors are capable of using all types of value-relevant information to mitigate the impacts of information incomplete, which in turn, see through the motives of managerial earnings reporting. And, institutional investors can change their portfolio (e.g., exclude the loss firms or unhealthy firms) to reduce risk rather than change of pricing multiples between accounting numbers. This study conjectures the value-relevance of equity book value for smoothed firms is less likely conditional on the value-relevance of earnings for institutional investors.

Accordingly, if institutional investors are better monitors of managerial opportunistic earnings reporting, the positive value-relevance of equity book value increases for firms with income smoothing in Fudenberg and Tirole’s argument, yet, decreases in Ohlson’s model substitute setting. On the other side, when institutional investors prefer near-term earnings resulting opportunistically earnings reporting to gain magnitude of trading benefits from informational advantage, the value-relevance of equity book value decreases for firms with income smoothing in Fudenberg and Tirole’s argument, yet, increases in Ohlson’s model substitute setting. Accordingly, the association between value-relevance of equity book value and institutional ownership for the smoothed firms is unclear. Thus, this study establishes the hypothesis H1b (null hypothesis type) as follows:

**H1b. Ceteris paribus, the relative value-relevance of equity book value for firms with smoothed earnings is not associated with institutional ownership.**

Note that the monitoring and myopic hypotheses are not mutually exclusive in the prior studies (Bushee 1998; Hsu and Koh 2005; Koh 2003) and to some extent are resulted by institutional investors’ trading strategies. Based on the firm-level data, institutional investors’ long-term or short-term oriented trading strategy can reflect distinctive shares volatility, short-term (long-term) trading strategy fosters (depresses) volatility. Therefore, institutional investors who adopted long-term oriented trading strategy are likely to have incentives in monitoring opportunistic earnings reporting, in turn, enhance the reporting quality. Alternatively, institutional investors who prefer near-term earnings have less incentive in monitoring earnings reporting, extremely, encourage managers’ opportunistic reporting and deteriorate earnings quality. If smoothed earnings firms have higher value-relevance of earnings (Fan 2009), this study conjectures the long-term oriented (short-term oriented) institutional investors will enhance (weaken) the positive association between income smoothing and the value-relevance of earnings. However, in the smoothed firms have lower value-relevance of earnings case, it is expected that the long-term oriented (short-term oriented) institutional investors will mitigate (aggravate) the negative association between income smoothing and value-relevance of earnings. This study establishes the second hypotheses as follows:

**H2a. Ceteris paribus, the positive association between income smoothing and value-relevance of earnings is enhanced (weakened) for firms have institutional investors with long-term (short-term) oriented trading strategy.**

**H2b. Ceteris paribus, the negative association between income smoothing and value-relevance of earnings is mitigated (deteriorated) for firms have institutional investors with long-term (short-term) oriented trading strategy.**

Follow the discussions in Hypothesis H1b, we have various facets to describe the relative value-relevance of equity book value for firms with smoothed earnings when incorporating the trading strategies (long-term vs. short-term oriented) of institutional investors into consideration. Firstly, long-term oriented institutional investors enhance the increased value-relevance of equity book value for firms with income smoothing in Fudenberg and Tirole’s argument and mitigate the decreased value-relevance of equity book value in Ohlson’s model substitute setting. Secondly, short-term oriented institutional investors weaken the increased value-relevance of equity book value for firms with income smoothing in Fudenberg and Tirole’s argument and deteriorate the decreased value-relevance of equity book value in Ohlson’s model substitute setting. Again, the association between value-relevance of equity book value and different trading strategies (long-term vs. short-term) institutional investors for the smoothed firms is unknown. This study thus has no obvious expectation on the association between firms with different trading strategies institutional investors and value-relevance of equity book value changes.
3. Research Design

3.1 Institutional Ownership and Income Smoothing Measures

3.1.1 Institutional Ownership Measure (INST)

The three major types of institutional investors in the Taiwan Stock Exchange are qualified foreign institutional investors (QFIIs), securities investment trust companies and dealers. This study combines these three types of institutional investors’ ownership (Chiao, Chen, and Huang 2011) and denotes them as the magnitude of institutional ownership (INST). Definitely, the INST is proxied by the total number of shares held by the three types of institutional investors divided by the total number of shares outstanding. This study further calculates the monthly average of INST for sample firms in each calendar year, respectively. Thus, the proxy for INST in the analysis is the mean of a firm’s monthly INST ownership.

This study further uses both institutional ownership and shareholdings volatility to measure institutional investors’ trading strategies. A firm is classified as a high institutional ownership (INST), if institutional ownership is more than the median ownership of the entire samples based on the industry/year data. In addition, this study uses the coefficient of variation (CV) of institutional ownership to proxy INST volatility (INST (CV)). The INST (CV) is measured as the standard deviation of a firm’s monthly INST ownership of the calendar year divided by the mean of the INST ownership. A firm is classified as long-term oriented INST which is proxied by low institutional shareholdings volatility, i.e., INST (CV) is less than the median of the industry/year INST (CV). Thus, the long-term oriented institutional investors (HL) is denoted as one for a firm which is classified as having both high INST ownership and low INST shareholdings volatility, and 0 otherwise. In the same manner, the short-term oriented institutional investors (LH) is denoted as one for a firm which is classified as having both low INST ownership and high INST shareholdings volatility, and 0 otherwise.

3.1.2 Income Smoothing Measure (IS)

This study follows Tucker and Zarowin (2006) and assumes managers use discretionary accruals to smooth earnings. To measure the income smoothing, we follow the procedures suggested by Leuz, Nanda, and Wysocki (2003) and Tucker and Zarowin (2006). First, we estimated the discretionary accruals (DA) from the cross-sectional modified Jones (1991) model of Kothari, Leone, and Wasley (2005). The pre-discretionary income (NDE) is calculated by subtracting discretionary accruals (DA) from net income. This study uses the current year and the past four-year’s observations to calculate the correlation between the change in discretionary accruals (ΔDA) and the change in pre-discretionary income (ΔNDE). Second, we measure a firm’s reversed fractional ranking of the correlation coefficient (between 0 and 1) within its industry-year and refer to it as the income smoothing measure (IS). This measure implies that there is an underlying pre-managed income series and that managers use discretionary accruals to make the reported series smooth (Tucker and Zarowin 2006). Thus, a more negative correlation between ΔDA and ΔNDE represents the more income smoothing.

3.2 Model Specification

This study follows related value-relevance research (Fan, Chen, and Liao 2008; Fan 2009; Fan and Chen 2013; Barth, Beaver, and Landsman 1998; Collins, Pincus, and Xie 1999; Marquardt and Wiedman 2004; Ou and Sepe 2002) and expresses the stock price as a linear function of earnings and equity book value to examine the role of institutional investors on the association between income smoothing and the value-relevance of accounting numbers. Holthausen and Watts (2001) argued that the valuation theory approach requires the model to specify the firm attributes that affect value and their relation to value and excludes the correlated omitted variables problem. With panel data analysis, especially as the estimation focuses on within-firm variation, omitted variables bias is avoided, provided it is reasonable to assume that the omitted variable is constant over the time frame of the study. However, the balanced panel analysis requires consistently reported data across every year of the panel; thus, it is got into trouble by the potential for sample attrition and survivorship bias (Henderson and Kaplan 2000). We thus use the unbalanced panel data which control for the firm characteristics in the models. This study also controls the year effect in the following examinations. 4, 5

4This study follows most of the value-relevance research (Arce and Mora 2002; Collins, Maydew, and Weiss 1997; Marquardt and Wiedman 2004; Nwaeze 1998; Ou and Sepe 2002) and expresses the stock price as a linear function of earnings and equity book value, which is denoted as the Ohlson (1995) model. We note that the empirical regressions in this study (Regression (1) and (2)) are not at all the same as the Ohlson’s framework. Conveniently, we describe our empirical regression as Ohlson (1995) model.

5This study follows most of the value-relevance research (Arce and Mora 2002; Collins, Maydew, and Weiss 1997; Marquardt and Wiedman 2004; Nwaeze 1998; Ou and Sepe 2002) and expresses the stock price as a linear function of earnings and equity book value, which is denoted as the Ohlson (1995) model. We note that the empirical regressions in this study (Regression (1) and (2)) are not at all the same as the Ohlson’s framework. Conveniently, we describe our empirical regression as Ohlson (1995) model.
Based on the Ohlson (1995) framework, this study expresses the stock price as a linear function of earnings and equity book value and examines the role of institutional investors on the association between income smoothing and the value-relevance of accounting numbers. We follow the model suggested by Fan (2009) and further incorporates our pivotal variable (INST) and the interactive variables of INST with the related variables into regression (i.e., IS*INST, IS**EPS*INST and IS*BV*INST). The empirical regression is presented as follows:

\[
P_{it} = \beta_0 + \beta_1 IS_{it} + \beta_2 EPS_{it} + \beta_3 BV_{it} + \beta_4 INST_{it} \\
+ \beta_5 IS_{it} * EPS_{it} + \beta_6 IS_{it} * BV_{it} \\
+ \beta_7 IS_{it} * INST_{it} + \beta_8 IS_{it} * EPS_{it} * INST_{it} \\
+ \beta_9 IS_{it} * BV_{it} * INST_{it} + \beta_{10} LEV_{it} \\
+ \beta_{11} ROE_{it} + \beta_{12} SIZE_{it} + \epsilon_{it}
\]

(1)

where:

- \(P_{it}\) firm \(i\)'s stock price per share at the end of year \(t\);
- \(EPS_{it}\) firm \(i\)'s reported earnings per share during year \(t\). Based on the theoretical valuation model derived from Ohlson (1995), we expect the coefficient of EPS to be positive;
- \(BV_{it}\) firm \(i\)'s equity book value per share at the end of year \(t\). Based on the theoretical valuation model derived from Ohlson (1995), we expect the coefficient of BV to be positive;
- \(IS_{it}\) firm \(i\)'s income smoothing measure in year \(t\);
- \(INST_{it}\) firm \(i\)'s monthly average of institutional ownership in year \(t\);
- \(LEV_{it}\) firm \(i\)'s leverage at the end of year \(t\), which is measured as the ratio of debt divided by total assets;
- \(ROE_{it}\) firm \(i\)'s return of shareholders’ equity in year \(t\);
- \(SIZE_{it}\) firm \(i\)'s size (SIZE) at the end of year \(t\), which is calculated by the natural logarithm of total assets;
- \(\epsilon_{it}\) the error term.

The coefficient of EPS*IS (\(\beta_9\)) in Equation (1) will be positive to reflect the increasing value-relevance (or informativeness) of earnings for firms with income smoothing (Fan 2009; Tucker and Zarowin 2006). The coefficient of BV*IS (\(\beta_8\)) will be positive (or negative) if income smoothing enhances the value-relevance of equity book value (or traded-off by the investors’ perceived weight of current earnings in the Ohlson (1995) setting). According to the hypothesis H1a, the coefficient of IS*EPS*INST variable (\(\beta_6\)) will be positive (negative) if the institutional monitoring hypothesis (the institutional myopic hypothesis) is supported. Naturally, \(\beta_6\) will be statistically insignificant if the institutional monitoring effect is traded-off by the myopic effect. On the other side, the hypothesis H1b predicts the coefficient of IS*BV*INST variable (\(\beta_7\)) will be positive (negative) if both the institutional monitoring hypothesis and the Fudenberg and Tirole's argument (the Ohlson’s model substitute setting) are supported. The coefficient of IS*BV*INST variable (\(\beta_7\)) will be negative (positive) if both the institutional myopic hypothesis and the Fudenberg and Tirole's argument (the Ohlson’s model substitute setting) are supported. Naturally, \(\beta_7\) will be statistically insignificant if the institutional monitoring effect is traded-off by the myopic effect.

Now, let this study turn to examine whether institutional investors’ long-term or short-term trading strategies can make a distinctive pattern of value-relevance of accounting numbers for firms with income smoothing. Equation (2) is a variant model of Equation (1). This study further incorporates the INSTs’ shareholdings volatility into the empirical model to examine whether the value-relevance conveyed by income smoothing for the firms with high INSTs’ ownerships is affected by the INSTs’ share-

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5Nizalova and Murtazashvili (2011) find that if the source of heterogeneity and omitted variable are jointly independent of treatment, then the OLS estimate on the interaction term between the treatment and endogenous factor turns out to be consistent. To control the unobservable firm-specific traits (or the omitted variables bias) and time-series dynamics in financial reporting, it is reasonable to use the unbalanced-panel regression which controls for the firm and the year fixed effect in the examinations. Moreover, we also use one prior year’s stock price to scale the pivotal explanatory variables (Lo and Lys 2000) to control the omitted variables problem and rerun the regressions. The additional diagnoses do not qualitatively change the primary results.

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6In the price-earnings-equity book value framework, this study uses the natural logarithm of total assets rather than the market value of equity to proxy a firm’s size to mitigate the possible endogenous relationship in the regressions.
holdings volatility. We expand Equation (1) by incorporating two dummy variables for INST’ shareholdings volatility, HL (high institutional ownership with low shareholdings volatility, which is presented the long-term oriented INST) and LH (low institutional ownership with high shareholdings volatility, which is presented the short-term oriented INST), and the related interactive variables (e.g., IS*HL, IS*LV, IS*EPS*HL, IS*BV*HL, IS*EPS*LH, and IS*BV* LH). The regression is presented as follows:

\[ P_t = \beta_0 + \beta_1 IS_t + \beta_2 EPS_t + \beta_3 BV_t + \beta_4 HL_t + \beta_5 IS_t * EPS_t + \beta_6 BV_t * LH_t + \beta_7 IS_t * EPS_t * HL_t + \beta_8 IS_t * BV_t * LH_t + \beta_9 ROE_t + \beta_{10} SIZE_t + \varepsilon_t \]  

where:

- HL_t: a dummy variable for firm i in year t with long-term oriented trading, which is denoted as one for firms with high institutional ownership and low institutional shareholdings volatility, 0 otherwise;
- LH_t: a dummy variable for firm i in year t with short-term oriented trading, which is denoted as one for firms with low institutional ownership and high institutional shareholdings volatility, 0 otherwise.

The definitions of the remaining variables are the same as Equation (2).

According to the hypothesis H2a and H2b, the coefficient of IS*EPS*HL variable (\( \beta_{10} \)) will be positive to reflect the positive (negative) association between income smoothing and value-relevance of earnings is enhanced (mitigated) for firms have institutional investors with long-term oriented trading strategy. Concurrently, the coefficient of IS*EPS*LH variable (\( \beta_{12} \)) will be negative to reflect the positive (negative) association between income smoothing and value-relevance of earnings is weakened (deteriorated) for firms have institutional investors with short-term oriented trading strategy. Naturally, \( \beta_{10} \) and/or \( \beta_{12} \) will be statistically insignificant if institutional investors’ trading strategies are not associated with the value-relevance of earnings for firms with income smoothing.

Moreover, this study has no obvious expectation on the association between smoothed firms with different trading strategies institutional investors and the value-relevance of equity book value changes. Thus, the coefficient of IS*BV*HL variable (\( \beta_{11} \)) and IS*BV*LH variable (\( \beta_{13} \)) is conditional on which effect (i.e., institutional monitoring/myopic role and Fudenberg and Tirole’s argument/Ohlson’s model substitute effect) dominates the other effects.

### 3.3 Data and Sample Selection

We choose 2001–2012 as the sample period. The year 2001 is chosen as the beginning observation year because the data of three major institutional investors’ ownerships are available. The sample firms used in this study are composed of publicly traded companies listed on the Taiwan Securities Exchange (TWSE) and over-the-counter market (OTC) in Taiwan. That only TWSE-listed and OTC-listed firms are considered is due to the feasibility of collecting the necessary reliable data. The empirical data are retrieved from the TEJ Database of the TWSE and OTC in Taiwan.

Consistent with extant literature, finance-related institutions (code 28) are excluded since they are subject to different disclosing requirements. We also exclude observations which are classified into the comprehensive industries (code 99) for their diversified characteristics and the observations for their belonging to the regulated industries (code 97). Because there are insufficient sample firms in some industries, we follow the study of Chang, Chou, and Lin (2003) combining some similar industries into one integrated industry to obtain larger samples and avoid the inefficiency of accruals earnings management to measure regression coefficients estimating. This study also deletes glass-ceramic (code 18), paper (code 19), and automobile (code 22) industries because there are too few listed firms causing trouble in estimating regression coefficients and industrial peculiarities. These selection procedures yield a final sample of 7,367 firm/year observations. Table 1 reports the sample selection process in the study.

### 4. Empirical Results

#### 4.1 Descriptive Statistics and Correlation Analysis

Table 2 presents the descriptive statistics for the related variables in this study. The raw income smooth measure Corr (\( \triangle DA, \triangle NDE \)) is between 0.982 to -1.
Table 1  Sample Selection Procedure and Industry Distribution of Cross-Sectional Jones (1991) Model

Panel A Sample Selection
Number of firms in TEJ database during 2001~2012 (excluded financial, comprehensive, and regulated industries) 14,881
Less: Firms with missing data (410)
Less: Firms’ data unavailable for calculating income smoothing (6,344)
Less: Firms belong to the industries with too few firms to estimate regression coefficients (760)
Final Empirical Samples 7,367


<table>
<thead>
<tr>
<th>Integrated Industry in the Study</th>
<th>TEJ Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction and Building Materials</td>
<td>Cement (11), Iron (20), and Construction (25)</td>
</tr>
<tr>
<td>Plastics, Rubber, and Chemical</td>
<td>Plastics (13), Chemical (17), and Rubbery (21)</td>
</tr>
<tr>
<td>Electric Machinery and Electric Appliance</td>
<td>Electric Machinery (15), Electric Wire (16)</td>
</tr>
<tr>
<td>Services and Sales</td>
<td>Tourism (27), Merchandise and Trade (29)</td>
</tr>
<tr>
<td>Electronics</td>
<td>Electronics (23)</td>
</tr>
<tr>
<td>Foods</td>
<td>Foods (12)</td>
</tr>
<tr>
<td>Spin and Fiber</td>
<td>Spin and Fiber (14)</td>
</tr>
<tr>
<td>Shipping</td>
<td>Shipping (26)</td>
</tr>
</tbody>
</table>

Table 2  Descriptive Statistics of Related Variables (N=7,367)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Q1</th>
<th>Median</th>
<th>Q3</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>28.172</td>
<td>36.020</td>
<td>10.500</td>
<td>18.250</td>
<td>33.000</td>
<td>0.480</td>
<td>442.000</td>
</tr>
<tr>
<td>Corr((\Delta DA), (\Delta NDE))</td>
<td>-0.820</td>
<td>0.279</td>
<td>-0.976</td>
<td>-0.930</td>
<td>-0.795</td>
<td>-1.000</td>
<td>0.982</td>
</tr>
<tr>
<td>IS</td>
<td>0.505</td>
<td>0.289</td>
<td>0.254</td>
<td>0.504</td>
<td>0.755</td>
<td>0.001</td>
<td>1.000</td>
</tr>
<tr>
<td>INST (%)</td>
<td>9.647</td>
<td>13.277</td>
<td>0.949</td>
<td>4.453</td>
<td>12.253</td>
<td>0.0002</td>
<td>96.769</td>
</tr>
<tr>
<td>INST(CV)</td>
<td>0.398</td>
<td>0.520</td>
<td>0.076</td>
<td>0.205</td>
<td>0.516</td>
<td>0.000</td>
<td>3.464</td>
</tr>
<tr>
<td>EPS</td>
<td>1.389</td>
<td>3.015</td>
<td>0.040</td>
<td>1.040</td>
<td>2.520</td>
<td>-14.940</td>
<td>23.880</td>
</tr>
<tr>
<td>BV</td>
<td>17.435</td>
<td>9.441</td>
<td>12.050</td>
<td>15.400</td>
<td>20.440</td>
<td>0.460</td>
<td>80.500</td>
</tr>
<tr>
<td>LEV</td>
<td>0.383</td>
<td>0.175</td>
<td>0.246</td>
<td>0.374</td>
<td>0.505</td>
<td>0.006</td>
<td>0.991</td>
</tr>
<tr>
<td>ROE</td>
<td>0.035</td>
<td>0.215</td>
<td>0.003</td>
<td>0.065</td>
<td>0.135</td>
<td>-1.758</td>
<td>0.544</td>
</tr>
</tbody>
</table>

Legends:
1. P: stock price at the end of year \(t\). Corr(\(\Delta DA\), \(\Delta NDE\)): Pearson correlation coefficients. IS: income smoothing measure. INST%: a firm’s annual average percentage of institutional ownership (include the QFIIs, investment trust companies and dealers) based on months. INST(CV): a firm’s coefficient of variation of institutional investors shareholding. EPS: net income divided by total number of shares outstanding. BV: book value of equity divided by total number of shares outstanding. LEV: a firm’s leverage. ROE: return on equity. SIZE: a firm’s size, which is measured by the natural logarithm of total assets.
2. “a” and “b” denote the significance on 1% and 5% levels respectively, based on two-tailed tests.
Table 3  Correlation Matrix (N=7,367)

<table>
<thead>
<tr>
<th></th>
<th>P</th>
<th>IS</th>
<th>INST(%)</th>
<th>EPS</th>
<th>BV</th>
<th>LEV</th>
<th>ROE</th>
<th>SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>1.000</td>
<td>-0.039a</td>
<td>0.375a</td>
<td>0.721a</td>
<td>0.706a</td>
<td>-0.145a</td>
<td>0.344a</td>
<td>0.206c</td>
</tr>
<tr>
<td>IS</td>
<td>0.024a</td>
<td>1.000</td>
<td>0.013a</td>
<td>0.038a</td>
<td>0.043a</td>
<td>0.069a</td>
<td>0.080a</td>
<td>0.008</td>
</tr>
<tr>
<td>INST(%)</td>
<td>0.410a</td>
<td>-0.018</td>
<td>1.000</td>
<td>0.348a</td>
<td>0.378a</td>
<td>-0.021</td>
<td>0.188a</td>
<td>0.496a</td>
</tr>
<tr>
<td>EPS</td>
<td>0.747a</td>
<td>0.077a</td>
<td>0.357a</td>
<td>1.000</td>
<td>0.695a</td>
<td>-0.163a</td>
<td>0.717a</td>
<td>0.245a</td>
</tr>
<tr>
<td>BV</td>
<td>0.728a</td>
<td>0.093a</td>
<td>0.412a</td>
<td>0.709a</td>
<td>1.000</td>
<td>-0.243a</td>
<td>0.434a</td>
<td>0.383a</td>
</tr>
<tr>
<td>LEV</td>
<td>-0.191a</td>
<td>0.081a</td>
<td>-0.134a</td>
<td>-0.236a</td>
<td>1.000</td>
<td>-0.264a</td>
<td>0.219a</td>
<td>0.209a</td>
</tr>
<tr>
<td>ROE</td>
<td>0.694a</td>
<td>0.067a</td>
<td>0.301a</td>
<td>0.966a</td>
<td>0.591a</td>
<td>-0.107a</td>
<td>1.000</td>
<td>0.209a</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.229a</td>
<td>0.016</td>
<td>0.553a</td>
<td>0.264a</td>
<td>0.404a</td>
<td>0.251a</td>
<td>0.200a</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Legends:
1. Variables are defined in Table 2.
2. The upper triangular of matrix presents Pearson correlation coefficients, and the lower triangular of matrix presents Spearman correlation coefficients.
3. “a” and “b” denote the significance on 1% and 5% levels respectively, based on two-tailed tests.

The first quartile (Q1) and third quartile (Q3) are both negative and reveal most of the sample firms smoothed their intertemporal incomes in this study. The mean (median) income smooth measure (IS) is 0.505 (0.504) to reflect the fractional ranking of the correlation coefficient (between 0 and 1). To minimize the effect of outliers, we winsorize the top and the bottom 0.5% of outlier samples based on the continuous variables (P, EPS, BV and ROE). Based on the winsorized data, the mean (median) of price (P), earnings per share (EPS), and equity book value (BV) is 28 (18.25), 1.389 (1.04), and 17.435 (15.4), respectively. The mean (median) of firms’ leverage (LEV) and natural logarithm of total assets (SIZE) is 0.383 (0.374) and 15.326 (15.144). It is found that the mean (median) of ROE is 3.5% (6.5%), which indicates that some outliers of negative earnings firms in the samples.

Table 3 presents the Pearson and Spearman correlations between related variables. It reveals the pivotal explanatory variables (EPS, BV and INST) are significantly positive-associated with stock price (P). It is fair to infer that earnings, equity book value, income smoothing and institutional ownership, respectively, plays an important role in a firm’s earnings reporting.

4.2 Regression Results

The estimation process of this study begins with least-squares regression of the pooled data followed by an assessment of the validity of the pooled model’s assumption of a single, overall intercept term. The Lagrange Multiplier Statistic (LM test) rejects the pooled model (which implies heterogeneous intercept), thus, panel data models, as conjectured, offer a more powerful approach. Subsequently, the estimation proceeds to panel data analysis and a choice between the fixed effect and random effect. The Hausman specification test reveals the potential for omitted variables bias and the importance of firm-specific effects in this setting ($\chi^2 = 309.86$ in IS_INST model and $\chi^2 = 337.09$ in IS_HL_LH model, respectively), thus, we anticipate the need to use the fixed-effect approach (Greene 2004). With the unbalanced-panel data analysis, both the omitted variables bias and survivorship bias are avoided and can provide confirmatory empirical results to support our conjectures. Consequently, we use unbalanced-panel regression which controls for the firm characteristics in the following examinations. We also control the year effect in the models (Liu 2001). This study adopts White (1980) heteroskedasticity consistent covariance matrix estimator to correct estimates of the coefficient covariance in the possible presence of heteroskedasticity in all empirical regressions. The regression results are presented in Table 4.

From Table 4, the Adj_R^2 is 0.823, 0.836, and 0.827 in the IS, IS_INST and IS_HL_LH model, respectively, all statistically significant at the 1%.
levels (F-value = 28.99, 31.44, and 29.57) and indicates the fitness of the model specification. It is found that the coefficients of EPS and BV are positive and statistically significant at the 1% level in the IS, IS INST and IS HL LH models. These results suggest that the value-relevance of earnings and equity book value are consistent with the findings documented by Collins, Maydew, and Weiss (1997) and Francis and Schipper (1999). The coefficients of IS*EPS and IS*BV are 1.89 (t=-3.82) and -0.545 (t=-2.05), statistically significant in the IS model. These results document that the more income smoothing, the more value-relevance increase of earnings; meanwhile, the more value-relevance decrease of equity book value. Investors are likely to assign a different weight earnings and equity book value in explaining stock values for firms with income smoothing. These results are consistent with the findings documented by Fan (2009).

The coefficients of IS*EPS*INST and IS*BV* INST are 0.115 (t=-4.01) and 0.019 (t=2.13), statistically significant at the 1% and 5% levels in the IS INST model. These results suggest that higher institutional ownership is, income smoothing generates more value-relevance of both earnings and equity book value. The empirical findings to some extent support the institutional monitoring hypothesis. Moreover, this finding implies investors both price managerial income smoothing and institutional ownership in their stock valuation. Note that institutional investors are capable of analyzing financial statements more proficiently than other investors to protect their large magnitude of wealth invested. Without consideration institutional investors’ trading strategies, on average, institutional investors are better monitors of managerial opportunistically earnings reporting, in turn, enhance both the value-relevance of earnings and equity book value. It is interesting to find that the coefficient of IS*INST is -0.699 (t=-3.24), statistically significant at the 1% level. Investors are likely to give the non-smoothed firms with large magnitude of institutional ownership a higher stock valuation, yet, the smoothed firms with large magnitude of institutional ownership do not. This finding implies the unknown motivation for managerial income smoothing results a conservative valuation for investors in pricing the smoothed firms.7

In the IS HL LH model, it documents that the coefficient of IS*EPS*HL is 2.062 (t=2.02), statistically significant at the 5% level. Meanwhile, the coefficients of IS*EPS*HL is -2.731 (t=-3.72), negative and statistically significant at the 1% level. These results present the increasing value-relevance of earnings is enhanced (is mitigated) for the smoothed firms with high institutional ownership and lower (higher) shareholding volatility. This finding suggests that the long-term (short-term) oriented institutional investors can play a more (less) monitoring role in managerial income smoothing, which in turn, increase (decrease) the value-relevance of earnings. Hypothesis H2a and H2b have gained empirical supports. However, the coefficients of IS*BV* HL and IS*BV*LH are -0.298 (t=-1.16) and -0.136 (t=-0.63), both negative and statistically insignificant. Thus, the value-relevance of equity book value for the smoothed firms is unlikely affected by the institutional trading strategies.8

The high institutional ownership includes both the high shareholdings volatility and low shareholdings volatility cases. As discussed above, if institutional investors are better monitors of managerial opportunistically earnings reporting, the quality of earnings will enhance with the increases in the level of institutional ownership (Bushee 1998; Chung, Firth, and Kim 2002; Jiambalvo, Rajgopal, and Venkataraman 2002). However, high ownership institutional investors’ frequent trading discourages such investors from becoming actively involved in the corporate governance of their portfolio firms. The excessive focus on current earnings by such institutional investors creates incentives for a firm’s managers to aggressively manage earnings. Consequently, the role of institutional investors for firms with high ownership and high shareholdings volatility (HH) in managerial earnings reporting is unclear. To understand the role of such type of institutional investors in the analysis, we implement two additional tests as follows: (1) We incorporate an additional dummy var-

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7DeFond and Park (1997) argue that concern about job security creates an incentive for managers to smooth earnings in consideration of both current and future relative performance. Their evidence suggests that when current earnings performance is poor, managers have an incentive to shift future earnings into the current period in order to decrease the possibility of dismissal. In this setting, managers borrow earnings from the future to artificially embellish current earnings performance upward in difficult times. On the other side, when current earnings are relatively high, managers may make accounting choices effectively saving current earnings for the possible use in the future.

8The correlations between control variables and the pivotal explanatory variables are statistically significant. Thus, to control the possible collinearity bias, this study removes the three control variables (LEV, ROE and SIZE) and reexamines the IS INST and IS HL LH models. These results are approximately the same as in the initial empirical findings. Thus, the hypotheses are again confirmed by the additional test of these refined models.
iable of high institutional ownership and high shareholdings volatility (HH) and the interactive variables with IS*EPS and IS*BV into the empirical model; (2) Combine the high institutional shareholdings volatility with high institutional ownership and with low institutional ownership as the frequent trading institutional investors (LHH). Namely, we use the dummy variable of LHH to proxy the short-term oriented traders, which is denoted as one for a firm with high institutional shareholdings volatility and having high or low institutional ownership, to replace the initial LH variable in the regression. Naturally, a firm is also classified as long-term oriented institutional investor which is proxied by HL.

In the first testing, the untabulated results reveal that the coefficient of IS*EPS*LH is statistically insignificant. It suggests both the value-relevance of earnings and equity book value of the smoothed firms with high institutional shareholdings volatility is indifferent from the benchmark subsample, i.e., low institutional ownership with low shareholdings volatility (LL). This somewhat surprising results can be attributed to the institutional investors with low ownership may become relatively less influential power on a firm’s income smoothing decision. In the second testing, the untabulated results reveal that the coefficients of IS*EPS*HL and IS*BV*HL are approximately the same as in the initial empirical findings. However, the coefficients of IS*EPS*LHH and IS*BV*LHH are positive but statistically insignificant. It suggests that the high ownership institutional investors mitigate the negative effect of high institutional shareholdings volatility on the value-relevance of earnings. Collectively, hypothesis H2a is supported, yet, hypothesis H2b gains partially supported in these further examinations. Moreover, the multiple facets of institutional investors (monitoring/myopia or long-term/short-term oriented trading) in a firm’s earning reporting and the Fudenberg and Tirole/the Ohlson’s model substitute setting result the value-relevance of equity book value for the smoothed firms is unlikely associated with the institutional trading strategies.

In sum, it is fair to conclude that institutional ownership is positively associated with both the value-relevance of earnings and equity book value for firms with income smoothing. The empirical results reveal that investors realize institutional investors with high ownership have strong incentives to monitor managerial earnings reporting in protecting their magnitude of wealth investment, which in turn, enhances the relative value-relevance of earnings and equity book value. Investors also perceive the monitoring role of institutional investors is sensitive to their trading strategies. In the income smoothing with high institutional ownership and lower shareholdings volatility case (the long-term oriented traders), the increasing value-relevance of earnings is enhanced. Yet, in the income smoothing with low institutional ownership and higher shareholdings volatility case, which is restrained by the fragmented shareholdings and frequent trading of institutional investors, it is found that the increasing value-relevance of earnings is mitigated. These findings support the conjecture that institutional investors play an important role in explaining managerial income smoothing on the value-relevance of earnings, specifically, for firms with high institutional ownership and low shareholdings volatility case.9

5. Robustness Checks

5.1 Alternative Influential Criteria of Institutional Ownership Examinations

We use the continuous variable to measure the institutional ownership and examine the value-relevance of accounting numbers conveyed by income smoothing in the initial empirical models. Prior studies (Brav et al. 2008; Kalelkar and Nwaeze 2011; Maug 1998) reveal that the monitoring role of institutional investors is associated with their magnitude of wealth investment. A potential concern is whether the institutional investors with small shareholdings can play a role with their influential power on a firm’s income smoothing decision. This study thus follows Bushee (1998) and uses truncated variables to measure institutional ownership and reruns the regressions. The institutional ownership is denoted as 0 for firms with institutional ownership that is less than the influential criteria (i.e., 5%), and the mean of a firm’s...
Table 4  Results of the Role of INSTs in Value-relevance of Accounting Numbers for Firms with Income Smoothing

\[
P_{it} = \beta_0 + \beta_1 IS_{it} + \beta_2 EPS_{it} + \beta_3 BV_{it} + \beta_4 INST_{it} + \beta_5 IS_{it} \ast EPS_{it} + \beta_6 IS_{it} \ast BV_{it} + \beta_7 IS_{it} \ast INST_{it} \\
+ \beta_8 EPS_{it} \ast INST_{it} + \beta_9 IS_{it} \ast BV_{it} \ast INST_{it} + \beta_{10} LEV_{it} + \beta_{11} ROE_{it} + \beta_{12} SIZE_{it} + \epsilon_{it}
\]

\[
P_{it} = \beta_0 + \beta_1 IS_{it} + \beta_2 EPS_{it} + \beta_3 BV_{it} + \beta_4 HL_{it} + \beta_5 LH_{it} + \beta_6 IS_{it} \ast EPS_{it} + \beta_7 IS_{it} \ast BV_{it} + \beta_8 IS_{it} \ast HL_{it} + \beta_9 IS_{it} \ast LH_{it} + \beta_{10} EPS_{it} \ast HL_{it} + \beta_{11} EPS_{it} \ast LH_{it} + \beta_{12} EPS_{it} \ast INST_{it} \\
+ \beta_{13} LEV_{it} + \beta_{14} ROE_{it} + \beta_{15} SIZE_{it} + \epsilon_{it}
\]

<table>
<thead>
<tr>
<th>Variables</th>
<th>IS Model</th>
<th>IS_INST Model</th>
<th>IS_HL_LH Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient (t-value)</td>
<td>Coefficient (t-value)</td>
<td>Coefficient (t-value)</td>
</tr>
<tr>
<td>Constant</td>
<td>58.080a  (t=2.69)</td>
<td>65.427a  (t=2.98)</td>
<td>62.291a  (t=2.37)</td>
</tr>
<tr>
<td>IS</td>
<td>6.836c   (t=1.89)</td>
<td>15.263a  (t=7.11)</td>
<td>5.922c   (t=2.54)</td>
</tr>
<tr>
<td>EPS</td>
<td>4.074a   (t=8.26)</td>
<td>3.653a   (t=7.78)</td>
<td>3.840a   (t=7.52)</td>
</tr>
<tr>
<td>BV</td>
<td>2.047a   (t=6.78)</td>
<td>1.889a   (t=6.44)</td>
<td>2.086a   (t=7.88)</td>
</tr>
<tr>
<td>INST</td>
<td>---</td>
<td>0.485a   (t=4.22)</td>
<td>---</td>
</tr>
<tr>
<td>HL</td>
<td>---</td>
<td>---</td>
<td>0.308</td>
</tr>
<tr>
<td>LH</td>
<td>---</td>
<td>---</td>
<td>-0.431</td>
</tr>
<tr>
<td>IS*EPS</td>
<td>1.890a   (t=3.82)</td>
<td>-0.038   (t=0.07)</td>
<td>1.991a   (t=2.54)</td>
</tr>
<tr>
<td>IS*BV</td>
<td>-0.545b  (t=2.05)</td>
<td>-0.905a  (t=4.71)</td>
<td>-0.501c  (t=2.89)</td>
</tr>
<tr>
<td>IS*INST</td>
<td>---</td>
<td>-0.699a  (t=3.24)</td>
<td>---</td>
</tr>
<tr>
<td>IS*HL</td>
<td>---</td>
<td>---</td>
<td>1.582</td>
</tr>
<tr>
<td>IS*LH</td>
<td>---</td>
<td>---</td>
<td>3.927</td>
</tr>
<tr>
<td>IS<em>EPS</em>INST</td>
<td>---</td>
<td>0.115b  (t=4.01)</td>
<td>---</td>
</tr>
<tr>
<td>IS<em>BV</em>INST</td>
<td>---</td>
<td>0.019a  (t=2.13)</td>
<td>---</td>
</tr>
<tr>
<td>IS<em>EPS</em>HL</td>
<td>---</td>
<td>---</td>
<td>2.062c   (t=2.02)</td>
</tr>
<tr>
<td>IS<em>BV</em>HL</td>
<td>---</td>
<td>---</td>
<td>-0.298</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>-2.731a  (t=3.72)</td>
<td></td>
</tr>
<tr>
<td>LEV</td>
<td>15.700a  (t=5.39)</td>
<td>15.410a  (t=5.15)</td>
<td>16.643a  (t=6.05)</td>
</tr>
<tr>
<td>ROE</td>
<td>-26.718b (t=13.15)</td>
<td>-19.833b (t=11.74)</td>
<td>-23.522b (t=15.96)</td>
</tr>
<tr>
<td>SIZE</td>
<td>-4.979a  (t=3.13)</td>
<td>-5.545c  (t=3.46)</td>
<td>-5.300a  (t=3.51)</td>
</tr>
<tr>
<td>N</td>
<td>7,367</td>
<td>7,367</td>
<td>7,367</td>
</tr>
<tr>
<td>Adj. R^2</td>
<td>0.823</td>
<td>0.836</td>
<td>0.827</td>
</tr>
<tr>
<td>F-value</td>
<td>28.99a</td>
<td>31.44a</td>
<td>29.57a</td>
</tr>
</tbody>
</table>

Legends:
1. HL: dummy variable (1 if the firm with high institutional ownership and low institutional shareholdings volatility, 0 otherwise). LH: dummy variable (1 if firms with low institutional ownership and high institutional shareholdings volatility, 0 otherwise). The other variables are defined in Table 2.
2. "a" and "b" denote the significance on 1% and 5% levels respectively, based on two-tailed tests.
Table 5  Results of the Role of INSTs in Value-relevance of Accounting Numbers for Firms with Income Smoothing-- The Influential Power and VR Model Examinations

Panel A: The Influential Power Examinations

<table>
<thead>
<tr>
<th></th>
<th>IS_INST Model</th>
<th>IS_HL_LH Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS<em>EPS</em>INST</td>
<td>0.113*</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>(t=4.12)</td>
<td></td>
</tr>
<tr>
<td>IS<em>BV</em>INST</td>
<td>0.019*</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>(t=2.25)</td>
<td></td>
</tr>
<tr>
<td>IS<em>EPS</em>HL</td>
<td>---</td>
<td>1.874*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(t=2.14)</td>
</tr>
<tr>
<td>IS<em>BV</em>HL</td>
<td>---</td>
<td>-0.195</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(t=-0.72)</td>
</tr>
<tr>
<td>IS<em>EPS</em>LH</td>
<td>---</td>
<td>-3.169*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(t=-4.65)</td>
</tr>
<tr>
<td>IS<em>BV</em>LH</td>
<td>---</td>
<td>0.014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(t=0.05)</td>
</tr>
</tbody>
</table>

Panel B: VR Model Examinations

<table>
<thead>
<tr>
<th></th>
<th>VR_INST Model</th>
<th>VR_HL_LH Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS<em>EPS</em>INST</td>
<td>0.107*</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>(t=3.25)</td>
<td></td>
</tr>
<tr>
<td>IS<em>BV</em>INST</td>
<td>0.028*</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>(t=2.96)</td>
<td></td>
</tr>
<tr>
<td>IS<em>EPS</em>HL</td>
<td>---</td>
<td>0.847</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(t=0.76)</td>
</tr>
<tr>
<td>IS<em>BV</em>HL</td>
<td>---</td>
<td>0.289</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(t=1.19)</td>
</tr>
<tr>
<td>IS<em>EPS</em>LH</td>
<td>---</td>
<td>-3.773*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(t=-3.91)</td>
</tr>
<tr>
<td>IS<em>BV</em>LH</td>
<td>---</td>
<td>0.421</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(t=1.17)</td>
</tr>
</tbody>
</table>

Legends:
1. VR: variance ratio; an income smoothing measure suggested by Chaney and Lewis (1998). The remaining variables are defined in Table 2 and Table 4.
2. "a" and "b" denote the significance on 1% and 5% levels respectively, based on two-tailed tests.

monthly average institutional ownership otherwise. We also use the 5% as an alternative cutoff criterion to calculate the dummy variable of HL and LH in the IS_HL_LH model. The additional results are reported in Table 5 Panel A and do not qualitative change the initial empirical findings. This study also uses the 10% as an alternative influential power cutoff criterion and reruns the regressions. The untabulated results reveal that the results are likely the same as in the initial empirical findings. It suggests our empirical findings are robust to the institutional investors’ influential power examinations.

Controlling shareholder’s incentive in managerial earnings reporting is a concern in the emerging stock markets. Institutional ownership surpasses half of a firm’s outstanding shareholdings is characterized as the controlling shareholders and can dominate the firm’s operations if they do. Consequently, this study removes the 172 observations that their monthly average of institutional ownership is more than 50% of the firm. The untabulated results reveal that the coefficient of IS*BV*INST is statistically insignificant. It suggests the value-relevance of equity book value for smoothed firms is conditional on the large magnitude of institutional ownership, i.e. controlling institutional shareholders. One explanation is the controlling institutional investors deeply show their concerns over both the earnings and equity book value information, yet, the non-controlling institutional investors with more interests in a firm’s earnings. Another implication can be attributed to investors price the firms with controlling institutional ownership a higher weight for earnings variable in their stock valuation. Except for the coefficient of IS*BV*INST in the IS_INST model, the empirical results are robust in this additional testing.
Table 6 Results of the Role of INSTs in Value-relevance of Accounting Numbers for Firms with Income Smoothing--- Cross-sectional Data, Collins, Pincus, and Xie (1999) and QFIIs and DOMII Models Examinations


<table>
<thead>
<tr>
<th></th>
<th>Cross-sectional Data</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IS_INST Model</td>
<td>IS_HL_LH Model</td>
<td>IS_INST Model</td>
</tr>
<tr>
<td>IS <em>EPS</em>INST</td>
<td>0.144(^a)</td>
<td>0.128(^a)</td>
<td>0.013(^b)</td>
</tr>
<tr>
<td></td>
<td>(t=4.75)</td>
<td>(t=4.14)</td>
<td>(t=1.66)</td>
</tr>
<tr>
<td>IS <em>BV</em>INST(or IS<em>BVt-1</em>INST)</td>
<td>2.739(^b)</td>
<td>0.126(^b)</td>
<td>1.996(^b)</td>
</tr>
<tr>
<td></td>
<td>(t=2.47)</td>
<td>(t=0.46)</td>
<td>(t=2.09)</td>
</tr>
<tr>
<td>IS <em>EPS</em>HL</td>
<td>0.126(^b)</td>
<td>-2.813(^b)</td>
<td>-2.465(^e)</td>
</tr>
<tr>
<td></td>
<td>(t=0.46)</td>
<td>(t=-1.02)</td>
<td>(t=-3.25)</td>
</tr>
<tr>
<td>IS <em>BV</em>HL</td>
<td>-0.190(^b)</td>
<td>-0.048(^b)</td>
<td>-0.123(^b)</td>
</tr>
<tr>
<td></td>
<td>(t=-0.68)</td>
<td>(t=-0.75)</td>
<td>(t=-0.89)</td>
</tr>
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</table>

Panel B: The QFIIs and DOMII Models Examinations

<table>
<thead>
<tr>
<th></th>
<th>QFIIs Model</th>
<th>DOMII Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IS_QFII Model</td>
<td>IS_HL_LH Model</td>
</tr>
<tr>
<td>IS<em>EPS</em>QFII(or DOMII)</td>
<td>0.094(^a)</td>
<td>0.621(^b)</td>
</tr>
<tr>
<td></td>
<td>(t=3.14)</td>
<td>(t=2.52)</td>
</tr>
<tr>
<td>IS<em>BV</em>QFII(or DOMII)</td>
<td>2.831(^b)</td>
<td>-0.194(^b)</td>
</tr>
<tr>
<td></td>
<td>(t=2.71)</td>
<td>(t=-1.02)</td>
</tr>
</tbody>
</table>

Legends:
1. BVt-1: equity book value in year t-1 scaled by the total number of shares outstanding. QFII: a firm’s annual average percentage of QFIIs ownership based on months. DOMII: a firm’s annual average percentage of domestic ownership (investment trust companies and dealers) based on months. HL: a dummy variable (1 if the firm with high QFIIs (DOMII) ownership and low QFIIs (DOMII) shareholdings volatility, 0 otherwise). LH: a dummy variable (1 if firms with low QFIIs (DOMII) ownership and high QFIIs (DOMII) shareholdings volatility, 0 otherwise). The remaining variables are defined in Table 2 and Table 4.
2. “a” and “b” denote the significance on 1% and 5% levels respectively, based on two-tailed tests.

5.2 Alternative Measure of Income Smoothing

The discretionary accruals estimating model might be misspecified (Kothari, Leone, and Wasley 2005). Our income smoothing measure may suffer from the potential time-series measurement error. Barth, Landsman, and Lang (2008) and Lang, Raedy, and Wilson (2006) suggested the use of year-based variance ratio (VR) approach can mitigate the time-series measurement bias in the analysis. To address this concern, we follow Chaney and Lewis (1998) and use the variance ratio to measure income smoothing. The variance ratio is the ratio of the variance of cash flows from operations to the variance of net income. Naturally, to control for industry and time effects, we follow Tucker and Zarowin (2006) and use a firm’s reversed fractional ranking of variance ratio based on industry/year and refer to it as the VR variable. The VR variable is calculated as follows:

Institutional Ownership, Income Smoothing and the Value-relevance of Accounting Numbers 125
The initial findings again gain supported in the pooled cross-sectional data regressions. To gain confirmatory results to support our findings, we use the pooled cross-sectional data to regressions. To gain confirmatory results to support our findings, we use the pooled cross-sectional data to construct the model and rerun the regressions. To gain confirmatory results to support our findings, we use the pooled cross-sectional data to construct the model and rerun the regressions.

5.4 Qualified Foreign Institutional Investors (QFIIs) and Domestic Institutional Investors (DOMIIs) Examinations

We find the average ownership of QFIIs, securities investment trust companies and dealers ownership is 8.14%, 1.33% and 0.19%, respectively, whereas the domestic institutional investors held less than 2% of firm-level ownership on average. Note that Brav et al. (2008) and Kalelkar and Nwaeze (2011) argued that the institutional investors acquire relative low ownership of a company’s stock do not intend to seek to influence control at the target company but are merely investing in the ordinary course of business. This study separates the entire institutional ownership into the QFIIs’ ownership and the domestic institutional investors’ ownership (DOMIIs, includes the investment trust companies and dealers) and recalculates the pivotal institutional characteristic variables, i.e., QFI, DOMII, HL and LH of QFIIs, HL and LH of DOMIIs. Subsequently, this study examines the role of qualified foreign institutional investors (QFIIs) and domestic institutional investors (DOMIIs) in the cross-sectional data regressions.

These results are approximately the same as the empirical findings documented in Table 4. It is likely findings are also robust to the Collins, Pincus, and Xie (1999) specification.

Var(CF) and Var(Nl) are the sample variance of quarterly cash flows from operations per share and of quarterly net income per share for firm i in year t, respectively. We further delete 71 observations for quarterly data unavailable and rerun Equations (1) and (2). The additional empirical results are reported in Table 5 Panel A. The coefficient of VR*EPS*HL is positive yet statistically insignificant. Thus, Hypothesis H2a does not gain empirical support in the VR measure setting. Collectively, except for the coefficient of VR*EPS*HL, the results are robust in VR measure test.

Additionally, following the study of Leuz, Nanda, and Wysocki (2003) and Bhattacharya, Daouk, and Welker (2003), we use the current year and the past four-year’s observations to calculate the correlation between the changes in accounting accruals and the changes in operating cash flows. Naturally, we also use a firm’s reversed fractional ranking of the correlation coefficient (between 0 and 1) within its industry/year and refer to it as the IS variable. The untabulated results reveal that this alternative income smoothing measure does not qualitatively change the primary results.

5.3 Pooled Cross-sectional Data Regression and Collins, Pincus, and Xie (1999) Model Examinations

This study uses the unbalanced-panel data with fixed-effect model to establish the initial empirical regressions. To gain confirmatory results to support our findings, we use the pooled cross-sectional data to construct the model and rerun the regressions.

The results are presented in Table 6 Panel A, which is denoted as “Cross-sectional Data” model. The initial findings again gain supported in the pooled cross-sectional data regressions.

We follow extant value-relevance research and express stock price as a linear function of current earnings and book value of equity. Yet, current earnings (EPS) can contribute a component to the end of equity book value (BV) and suffers from the correlated coefficients estimating. Therefore, this study uses the preceding year’s equity book value (BV t-1) to replace the initial BV variable (Collins, Pincus, and Xie 1999) and reruns the Equations (1) and (2). The further tests are denoted as “Collins, Pincus, and Xie (1999) Model” and presented in Table 6 Panel A.

Var(CF) and Var(Nl) are the sample variance of quarterly cash flows from operations per share and of quarterly net income per share for firm i in year t, respectively. We further delete 71 observations for quarterly data unavailable and rerun Equations (1) and (2). The additional empirical results are reported in Table 5 Panel A. The coefficient of VR*EPS*HL is positive yet statistically insignificant. Thus, Hypothesis H2a does not gain empirical support in the VR measure setting. Collectively, except for the coefficient of VR*EPS*HL, the results are robust in VR measure test.

Additionally, following the study of Leuz, Nanda, and Wysocki (2003) and Bhattacharya, Daouk, and Welker (2003), we use the current year and the past four-year’s observations to calculate the correlation between the changes in accounting accruals and the changes in operating cash flows. Naturally, we also use a firm’s reversed fractional ranking of the correlation coefficient (between 0 and 1) within its industry/year and refer to it as the IS variable. The untabulated results reveal that this alternative income smoothing measure does not qualitatively change the primary results.

These results are approximately the same as the empirical findings documented in Table 4. It is likely findings are also robust to the Collins, Pincus, and Xie (1999) specification.

5.4 Qualified Foreign Institutional Investors (QFIIs) and Domestic Institutional Investors (DOMIIs) Examinations

We find the average ownership of QFIIs, securities investment trust companies and dealers ownership is 8.14%, 1.33% and 0.19%, respectively, whereas the domestic institutional investors held less than 2% of firm-level ownership on average. Note that Brav et al. (2008) and Kalelkar and Nwaeze (2011) argued that the institutional investors acquire relative low ownership of a company’s stock do not intend to seek to influence control at the target company but are merely investing in the ordinary course of business. This study separates the entire institutional ownership into the QFIIs’ ownership and the domestic institutional investors’ ownership (DOMIIs, includes the investment trust companies and dealers) and recalculates the pivotal institutional characteristic variables, i.e., QFI, DOMII, HL and LH of QFIIs, HL and LH of DOMIIs. Subsequently, this study examines the role of qualified foreign institutional investors (QFIIs) and domestic institutional investors (DOMIIs) in the cross-sectional data regressions.

We follow extant value-relevance research and express stock price as a linear function of current earnings and book value of equity. Yet, current earnings (EPS) can contribute a component to the end of equity book value (BV) and suffers from the correlated coefficients estimating. Therefore, this study uses the preceding year’s equity book value (BV t-1) to replace the initial BV variable (Collins, Pincus, and Xie 1999) and reruns the Equations (1) and (2). The further tests are denoted as “Collins, Pincus, and Xie (1999) Model” and presented in Table 6 Panel A.
Table 7  Results of the Role of INSTs in Value-relevance of Accounting Numbers for Firms with Income Smoothing--- Decile Ranking Model, Operating NI Model, CFO Model and Return Model

Panel A: Alternative Measures of Pivotal Explanatory Variable

<table>
<thead>
<tr>
<th>Panel</th>
<th>Decile Ranking Model</th>
<th>Operating NI Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IS_INST Model</td>
<td>IS_HL_LH Model</td>
</tr>
<tr>
<td>IS_EPS_INST</td>
<td>0.509a(t=3.17)</td>
<td>---</td>
</tr>
<tr>
<td>IS_BV_INST</td>
<td>0.991a(t=3.77)</td>
<td>---</td>
</tr>
<tr>
<td>IS_EPS_HL</td>
<td>---</td>
<td>11.380c(t=1.90)</td>
</tr>
<tr>
<td>IS_BV_HL</td>
<td>---</td>
<td>-1.204(t=-0.17)</td>
</tr>
<tr>
<td>IS_EPS_LH</td>
<td>---</td>
<td>-8.466b(t=-2.15)</td>
</tr>
<tr>
<td>IS_BV_LH</td>
<td>---</td>
<td>-8.809b(t=-3.09)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel</th>
<th>CFO Price Model</th>
<th>Return Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IS_INST Model</td>
<td>IS_HL_LH Model</td>
</tr>
<tr>
<td>IS_EPS_INST (or IS_EPS_DEL)</td>
<td>0.130a(t=4.79)</td>
<td>---</td>
</tr>
<tr>
<td>IS_BV_INST (or IS_BV_DEL)</td>
<td>0.020b(t=2.13)</td>
<td>-0.001(t=-1.53)</td>
</tr>
<tr>
<td>IS_EPS_HL (or IS_EPS_DEL)</td>
<td>---</td>
<td>2.541b(t=2.55)</td>
</tr>
<tr>
<td>IS_BV_HL (or IS_BV_DEL)</td>
<td>---</td>
<td>-0.335(t=-1.32)</td>
</tr>
<tr>
<td>IS_EPS_LH (or IS_EPS_DEL)</td>
<td>---</td>
<td>-3.041a(t=-4.21)</td>
</tr>
<tr>
<td>IS_BV_LH (or IS_BV_DEL)</td>
<td>---</td>
<td>-0.156(t=-0.70)</td>
</tr>
</tbody>
</table>

Legends:
1. EPS: the decile ranking of EPS variable in the “decile ranking model”, yet, the operating net income per share in the “operating NI model”. BV: the decile ranking of BV variable in the “decile ranking model”. CFO: operating cash flows scaled by the owners’ equity at the end of year. ΔEPS: changes of EPS scaled by the stock price at the beginning of the year. ΔBV: change of equity book value scaled by the stock price at the beginning of the year. ΔINST(%): changes of institutional ownership. The remaining variables are defined in Table 2 and Table 4.

5.5 Alternative Measure of Earnings/Equity Book Value Variables

This study follows related value-relevance research and uses earnings per share and equity book value per share to proxy the accounting numbers (i.e., EPS and BV). The descriptive statistic reveals that the mean of BV variable is larger than that of EPS in the analysis. It implies different weight in the accounting numbers for the pivotal interactive explanatory variables (e.g., IS_EPS_INST, IS_BV_INST, and among others) in the empirical analysis. To remove this concern, we use the decile ranks of EPS and BV to replace the actual values for EPS and BV and rerun the
regressions. The EPS and BV variables sort decile from 0 to 9 based on the industry/year and scaled the ranks by the largest value, which results the scaled ranks of EPS and BV variables (from 0 to 1) in the analysis. The additional results are denoted as the “Decile Ranking” model and presented in Table 7 Panel A. The further evidence does not qualitatively change our initial findings.

Furthermore, this study follows Fan (2009) and Fan and Chen (2013) and uses net income to measure EPS in the analysis. We also use the continuous operating net income per share to replace the initial EPS measure and rerun the regressions. The continuous operating income is defined as income before extraordinary items, discontinued operations, cumulative effects of accounting changes and tax-adjusted special items (Collins, Pincus, and Xie 1999). The additional results are denoted as "Operating NI" model and presented in Table 7 Panel A. The results are approximately the same as in the initial empirical findings. According to above two additional examinations, it is safe to conclude that the empirical findings are robust in the alternative measure of earnings and/or equity book value tests.

5.6 Model Specification Examinations

Institutional ownership is influenced by the economic characteristics of the firm and the institutional investors may seek to invest in firms with or without income smoothing (Jiambalvo, Rajgopal, and Venkatachalam 2002; Velury and Jenkins 2006). To control for such endogeneity, this study follows Ramalingegowda and Yu (2012) to establish the first stage regression (Equation (4) as follows) and estimates the residual value of INSTo (and which is denoted as RES INSTo). The RES INSTo presents the institutional ownership which is excluded the income smoothing component. This study then uses the residual value (RES INSTo) to replace the initial pivotal explanatory variable (INSTo) and reruns the equations.

\[ INST_o = \beta_0 + \beta_1 IS_o + \epsilon_o \]  

(4)

The untabulated empirical results do not qualitatively change after controlling the possible endogeneity between institutional ownership and managerial income smoothing. In addition, Collins, Pincus, and Xie (1999) postulated that the price-earnings relation is not homogenous across loss and profit firms. Managers in the loss firms may favor to take a bath rather than income smoothing in earnings reporting. Accordingly, we incorporate a dummy variable for loss firms (a loss firm is denoted as one otherwise zero) and the related interactive variables into empirical model (Equation (5) to control the inhomogeneous price-earnings relation across loss and profit firms.

\[ P_e = \beta_0 + \beta_1 IS_e + \beta_2 EPS_e + \beta_3 BV_e + \beta_4 INST_e \]

\[ + \beta_5 IS_e * EPS_e + \beta_6 IS_e * BV_e + \beta_7 IS_e * INST_e \]

\[ + \beta_8 LEV_e + \beta_9 ROE_e + \beta_{10} SIZE_e \]

\[ + \gamma_0 LOSS_e + \gamma_1 IS_e + \gamma_2 EPS_e + \gamma_3 BV_e + \gamma_4 INST_e \]

\[ + \gamma_5 IS_e * EPS_e + \gamma_6 IS_e * BV_e + \gamma_7 IS_e * INST_e \]

\[ + \gamma_8 LEV_e + \gamma_9 ROE_e + \gamma_{10} SIZE_e + \epsilon_e \]  

(5)

The untabulated results reveal that the findings are supported in the controlling negative profit subsample tests. Moreover, this study uses the returns of equity (ROE) to proxy earnings performance to control the amount of discretion any firm has to shift income from one period to another, i.e., poor earnings performance reduces a firm’s flexibility to shift income across periods (Trueman and Titman 1988). Yet, it is surprising to find that the estimated coefficient of ROE in the regression is negative and statistically

12To remove the “take a bath” possibility in the analysis, we use operating earnings scaled by the stock price at the beginning of the year as ranking basis and delete the lowest 20% samples that are denoted as the poor earnings performance observations. The untabulated results reveal that the “take a bath” reason is likely to exempt from the empirical findings.

13Note that the IS measure is calculated based on firm-year level. In the residual model, the INST variable is measured by the residual value of Equation (4). We are unable to obtain the monthly residual value of institutional ownership to calculate the coefficient of variation (CV), which in turn, the HL and LH variables in examining the IS HL LH model. Moreover, it is worth to be mentioned that, incorporating the HL, LH and the related interactive variables into regression, we cannot result estimators for the serious collinearity in the following “Loss Model”. Thus, we also leave out the presentation of IS HL LH model in the “Loss Model”.

11This study also uses the institutional shareholdings turnover rate (Liang, Lin, and Chin 2012) to measure institutional shareholdings volatility and reruns Equation (2). The turnover rate is measured as the average of the total number of shares purchased and the sale of sample firms by the institutional investors scaled by the total number of shares outstanding each year. The results are likely the same as the initial findings.
significant. This result to the extent can be attributed to the high correlation between ROE and EPS. We thus use operating cash flows scaled by the owners’ equity at the end of year as an alternative performance variable and rerun the equations. The results are presented in Table 7 Panel B and denoted as the “CFO Model”. The results again support our initial findings.

Finally, this study uses the return model to examine the role of institutional ownership on the stock returns of firms with income smoothing. The empirical regressions are presented as follows:

\[ AR_i = \beta_0 + \beta_1 IS_i + \beta_2 EPS_i + \beta_3 ABV_i + \beta_4 IS_i \times EPS_i + \beta_5 IS_i \times ABV_i + \beta_6 IS_i \times EPS_i \times ABV_i + \beta_7 IS_i \times EPS_i \times ABV_i \times INST_i + \epsilon_i \]

\[ AR_i = \beta_0 + \beta_1 IS_i + \beta_2 EPS_i + \beta_3 ABV_i + \beta_4 HL_i + \beta_5 IS_i \times EPS_i + \beta_6 IS_i \times ABV_i + \beta_7 IS_i \times EPS_i \times ABV_i + \beta_8 IS_i \times EPS_i \times HL_i + \beta_9 IS_i \times EPS_i \times ABV_i \times HL_i + \epsilon_i \]

where, AR is the industry-adjusted annual stock return for firm i in year t. The definitions of IS, HL, and LH are the same as Equation (2). The definitions of remaining variables in Equations (6) and (7) are the same as Equation (1), yet, the level amounts are replaced by the change amounts scaled by the stock price at the beginning of the year. This additional testing is denoted as “Return Model” and presented in Table 7 Panel B. Except for the coefficient of IS*ΔBV*ΔINST, the results are approximately the same as the initial findings. We note that the changes of equity book value (ΔBV) is relative small when dividend near to current net income. Thus, the statistically insignificant of IS*ΔBV*ΔINST may be resulted from the stable nature of equity book value. The coefficients of IS*ΔEPS*HL and IS*ΔBV*HL are both statistically insignificant. The major findings are robust in the additional tests. And, the coefficients of IS*ΔINST is positive and statistically insignificant. It is likely the results from the return model reduce the problem of omitted variables.

In summary, we present evidence consistent with the monitoring role of INSTs in the value-relevance of accounting numbers for firms with income smoothing. These additional examinations include using an alternative income smoothing measure, a different influential cutoff criteria for QFIs’ ownership, an alternative measure of INSTs’ shareholdings volatility, cross-sectional data, Collins, Pipecus, and Xie (1999) model, qualified foreign and domestic institutional investors, an alternative pivotal explanatory variables, and model specification examination. The major findings are robust in these additional tests.

6. Conclusions

Based on the stylized price-earnings-equity book value relationship specification, this study examines institutional investors’ characteristics (ownership and trading strategies) on the value-relevance of earnings and equity book value for firms with income smoothing. The empirical results reveal that:

1) The higher institutional ownership is, the more income smoothing generates more value-relevance of earnings and equity book value. The results to some extent support the institutional monitoring hypothesis. It suggests that investor’s pricing multiples in assessing a firm’s value are both associated with managerial income smoothing and institutional characteristics, i.e., ownership and trading strategy.

2) Incorporating the trading strategy into consideration, the results reveal distinctive patterns for institutional investors with long-term oriented or short-term oriented trading strategy. In the income smoothing with higher institutional ownership and lower shareholdings volatility case, it reveals that the increasing value-relevance of earnings is enhanced. Yet, in the income smoothing with lower institutional ownership and higher shareholding volatility case, it is found that the increasing value-relevance of earnings is mitigated.

Note that there are two competing hypothesis, informativeness (Chaney and Lewis 1995; Hunt, Moyer, and Shevlin 2000; Sankar and Subramanyam 2001; Tucker and Zarowin 2006) versus opportunism (Arya, Glover, and Sunder 1998; Fudenberg and Tirole 1995), of income smoothing as far as the earnings quality is concerned. Our empirical result reveals that, to the extent, one underlying motivation for managers’ income smoothing behavior is to com-
municate private information about future earnings and supports the empirical findings that are documented by Hunt, Moyer, and Shevlin (2000), Tucker and Zarowin (2006), and Fan (2009) that smoothed earnings improve earnings informativeness. This finding provides further evidence to support the conjecture that income smoothing along with high institutional ownership enhances the value-relevance of accounting numbers. It also suggests that investors price smoothed accounting information differently, yet depending on both institutional ownership and their trading strategies. Namely, this study highlights the importance and necessity of considering institutional ownership and their trading strategies in the value-relevance research. From management practices perspective, the finding implies high institutional ownership firms can improve value-relevance of earnings through intertemporal income smoothing. Consequently, if low institutional ownership firms need smoothed income to communicate their private information about future earnings, attracting more institutional ownership is a practicable approach.

The findings are subject to a number of limitations and should be interpreted with caution. First, our analysis is based on the stylized Ohlson (1995) model, the usual caution with joint model fitting and income smoothing/institutional ownership effect should be employed in interpreting the results. Second, we use the cross-sectional Jones (1991) model of Kothari, Leone, and Wasley (2005) to calculate the discretionary accruals, which in turn, are to measure the income smoothing proxy. Therefore, this study cannot remove the possibility that other measures of income smoothing constitute bias in our empirical findings. Third, this study uses the three major types of institutional investors (i.e., qualified foreign institutional investors, securities investment trust companies and dealers) in the Taiwan Stock Exchange to measure institutional ownership which, therefore, the empirical findings may not extend to other institutions setting (e.g., banking or government funds). Finally, as Holthausen and Watts (2001) pointed out, the valuation approach requires the model to specify the firm attributes that affect value and the correlated omitted variables bias should be taken into consideration in explanation the empirical findings, thus, the omitted variables problem remains a concern.
REFERENCE


Balachandran, Sudhakar and Partha Mohanram (2011), “Is the Decline in the Value Relevance of Accounting Driven by Increased Conservatism?” *Review of Accounting Studies*, 16(2), 272-301.


