

Does financial reporting above or below operating income matter to firms and investors? The case of investment income in China

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Abstract We explore a unique regulatory change in China in 2007 that moves investment income in an income statement from below the line of operating income to above the line. We find that, post-regulatory change, firms report high investment income when core earnings (operating income excluding investment income) are low and vice versa. Investment income and core earnings exhibit a significantly negative correlation every year post regulation, in contrast to a significantly positive correlation beforehand. We also find that investors do not fully see through the change. Before the regulation, both core earnings and investment income are positively correlated with contemporaneous stock returns and uncorrelated with future stock returns, suggesting appropriate pricing of the information. However, afterward, the results on core earnings are similar to those in the pre-regulation period, but investment income is negatively correlated with future stock returns, implying that the stock market overreacts to the information in investment income in the contemporaneous year.

Keywords Core earnings · Investment income · Operating income · Mispricing

JEL classification M40 · M41 · G12 · G14

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1 Introduction

There is a growing literature on how the location of income statement items affects firms' opportunism and investors' reaction to this financial information (Lee et al. 2006; Bartov and Mohanram 2014). For example, Lee et al. (2006) show that, even though SFAS No. 130 encourages firms to report comprehensive income on a performance statement, property-liability insurers with a tendency to manage earnings through realized gains and losses from marketable securities ("cherry pickers") are more likely to report comprehensive income in a statement of equity, a less salient disclosure. Bartov and Mohanram (2014) find that repositioning gains/losses from early debt extinguishments from below the line in the income statement to above it affects the market response to this item. This suggests investors may value an earnings component differently depending on where it appears in the income statement, even though its economic content remains the same. These studies have focused on specific industries or on specific transactions.

In this paper, we explore a unique setting of regulatory change that affects the income statement presentation of a far more ubiquitous transaction—gains/losses from investment, an item more likely to be used as a tool of earnings management. China's adoption of new IFRS-based accounting standards in 2007 moved investment income from below the line of operating income to above the line in the income statement. Operating income measures the firm's ability to generate profits from continuing and core business. The Chinese Securities Regulatory Commission (CSRC) views operating income as a highly important performance metric and requires all listed firms to present it in the key summary of accounting data that precedes financial statements, thus delivering a clear image of a firm's core profitability. We posit that both firms and investors respond to this regulatory change, interconnecting firms' earnings management and investors' pricing of investment income. Specifically, if the amount of investment income is subject to management discretion, as with which investments to sell and when, firms may have incentives to manage operating income via investment income.¹ We further explore whether the stock market fully incorporates the information in investment income, as changing its location in the income statement could induce firms to alter their behavior, thus modifying its information content.

The Chinese setting of regulation change is unique in two ways. First, China is among the largest and fastest growing economies and capital markets in the world. Understanding firm and investor behavior there is crucial to academics, practitioners, and policymakers. Second, while studies have identified how firms opportunistically respond to regulatory changes or how investors' pricing of accounting information can be affected by the location of information in the income statement, this situation is

¹ To validate the assumption that firms have incentives to manage operating income, we examine the valuation implications of as-reported operating income and other income. Conceptually, operating income represents a firm's core performance and thus should be valued highly by investors. In contrast, other income is more likely to be transitory and should be valued less by investors. To examine the relationship between contemporaneous stock returns and operating income and other income, we consider both the levels and the changes regressions. In untabulated analysis, we find that, in both specifications, operating income is highly priced in the market whereas other income is not. We also find that executive compensation is positively correlated with as-reported operating income and uncorrelated with other income, consistent with the idea that executives are rewarded on recurring operating income but not on transitory other income. Both sets of results lend support to the idea that firms have incentives to manage operating income.

likely to be exacerbated in China, given the country's weak corporate governance and lower level of investor sophistication (Kun-Chih et al. 2016).

We construct a sample spanning seven years before the regulation change and nine years afterward. Our sample consists of 26,239 firm-years from 2000 to 2015 with nonmissing investment income and core earnings, which we define as operating income excluding investment income. In the pre-regulation period, core earnings equal operating income. In the post-regulation period, core earnings equal operating income minus investment income and unrealized gains and losses from trading securities, both of which are included as part of operating income after the regulation change.²

We report two major findings. First, investment income experiences a regime shift in its correlation with core earnings after 2006, suggesting that firms have changed their behavior in response to the regulation change. Investment income and core earnings are strongly positively correlated every year before the regulation, an intuitive result suggesting that a firm's investment performance tends to co-move with its core business, owing to economy-wide or industry-wide factors or both. However, after the regulation, investment income and core earnings are strongly negatively correlated every year, indicating that investment income becomes an earnings management tool. Earnings management is not limited to investment income, and we find that non-operating income also plays an increasingly important role in smoothing earnings, confirming the contracting role of earnings in China (He et al. 2012).

Second, the stock market reaction to investment income varies significantly between the pre- and post-regulation periods. Before the regulation, both core earnings and investment income are positively correlated with contemporaneous stock returns and uncorrelated with future stock returns, suggesting that the stock prices fully incorporate the information. Afterward, core earnings are still positively correlated with contemporaneous stock returns and uncorrelated with future returns, suggesting that the market's reaction to core earnings is complete in both regimes. However, while investment income is positively correlated with contemporaneous stock returns, it exhibits a significantly negative correlation with future returns, implying that the stock market overreacts to the contemporaneous information in investment income and that this overreaction is corrected in the subsequent year in the post-regulation period. We do not observe any mispricing of non-operating income and expenses, which are reported below the operating income line in both the pre- and post-regulation periods.

To further explore how corporate managers alter their investments to influence investment income and cause investor over-valuation, we decompose investment income into two components: (1) profits/losses related to associates and joint ventures and (2) other investment income. Profits/losses related to associates and joint ventures, a separately listed item under the total amount of investment income, is the income from invested companies under the equity method. Other investment income, more discretionary in nature, primarily includes profits/losses from the disposal or sale of financial assets and long-term equity investments. We find that the negative association of investment income with core earnings and future stock returns is mainly driven by other investment income, suggesting real earnings management, through the

² Unrealized gains or losses from trading securities are a newly introduced item in the post-regulation period, so we cannot compare the information content of this item in the pre- versus post-regulation periods.

discretionary sale of investments, alters the information content of investment income and potentially mislead investors.

We conduct a number of supplementary tests. We examine the timing of earnings management by using quarterly data. Consistent with the prediction that, if firms manage earnings via investment income, they are more likely to do so in the fourth quarter than in the first three quarters (Das et al. 2009), we find the results to be stronger in the fourth quarter than in the first three. We also find a strong negative correlation between core earnings in the first three quarters and investment income in the fourth quarter in the post-regulation period, a lead-lag relationship that helps to address causality. In addition, we assess the role of external and internal monitoring in earnings management. We use Big Four auditors and analyst coverage to proxy for external monitoring and use the size of the board to proxy for internal monitoring. After the regulation, the negative association between core earnings and investment income is alleviated by the Big Four auditors, extensive analyst coverage, and a large board, suggesting that stronger monitoring reduces incentives to manage operating earnings. Finally, we consider earnings thresholds on the premise that firms are less likely to use investment income to boost operating income if they are performing well in the first place. Consistent with this prediction, we find that earnings management is much weaker when core earnings are positive or exceed the prior-year level.

Our paper makes two major contributions. First, whereas two related studies (Bartov and Mohanram 2014; Lee et al. 2006) focus on a specific transaction or a specific industry in the United States, we consider a change in the reporting format of investment income that affects all firms in China. Arguably, in most countries, investment income reflects more regular business activities than gains/losses from early debt extinguishments, considered by Bartov and Mohanram (2014), or unrealized gains/losses on available-for-sale securities for property-liability insurers, considered by Lee et al. (2006). Second, and more importantly, we jointly consider firms' earnings management and investors' pricing of accounting information as a joint outcome in response to regulatory changes. When investment income is moved from below the line to above it, firms can change their investments and thus change the information content of investment income. Therefore, compared to findings of Bartov and Mohanram (2014), our results not only highlight the valuation implications of different locations for the same line item in financial statements but also stress that market misvaluation may be due to the change in information content caused by the shift of financial disclosure regimes.

We organize the rest of the paper as follows. Section 2 reviews the literature and institutional background. Section 3 describes our sample and provides descriptive statistics, while Section 4 presents the main empirical results. Section 5 discusses robustness checks and additional tests, and Section 6 concludes.

2 Prior research and regulatory background

2.1 Prior literature

This paper relates to two lines of research. The first line is the extensive literature on earnings management, especially related to regulations. (See the

reviews by Schipper 1989; Healy and Wahlen 1999; Dechow and Skinner 2000; Fields et al. 2001; and Dechow et al. 2010.) Firms manage earnings for a variety of reasons, such as financial incentives, regulatory purposes, and capital markets pressure. New regulations often change firms' financial reporting behavior. For example, the regulation on LIFO/FIFO that requires a firm to use the same inventory method for financial reporting and tax purposes could induce earnings management, in the sense that some firms might be willing to pay more taxes to report higher earnings for financial reporting purposes (Abdel-Khalik and McKeown 1978; Morse and Richardson 1983). Lee et al. (2006) show that, following SFAS No. 130, property-liability insurers with a tendency to manage earnings through realized securities' gains and losses ("cherry pickers") are more likely to report comprehensive income in a statement of equity, a less salient disclosure than a performance statement. Dong and Zhang (2018) show that, after SFAS No. 115, U.S. commercial banks continue to manage earnings through selective selling of available-for-sale securities.

In China, many capital market regulations specify contractual terms involving accounting numbers. Both IPO and delisting regulations are based on earnings. A firm will be suspended from trading if it reports a loss in three consecutive years. In addition, a firm needs to maintain a minimum level of return on equity over the last three years before it can issue a seasoned equity offering. This contracting role of earnings gives firms strong incentives to manage earnings (Aharony et al. 2000; Chen and Yuan 2004; He et al. 2012). For example, Chen and Yuan (2004) find that firms manage earnings to meet the regulatory threshold for rights issue approval. He et al. (2012) find that firms with a negative fair value change in their trading securities are more likely to sell available-for-sale securities for a gain. They also find that abnormal gains from debt restructuring are positively associated with a firm's incentives to avoid reporting a loss. From the contracting perspective of earnings, we expect investment income to exercise a role similar to that of non-operating income and other earnings items that managers use discretionally to meet earnings targets.

The second line of research relevant to this paper relates to investors' pricing of accounting numbers (Ball and Brown 1968; Sloan 1996; Dechow et al. 2008; Richardson et al. 2005; Luo 2008). Many studies find that markets fail to fully price earnings information (Bernard and Thomas 1990; Burgstahler et al. 2002). Investors have limited attention to give to the vast amounts of available information (Hirshleifer and Teoh 2003) and accordingly find searching among thousands of companies for every piece of information relevant to security valuation both difficult and costly (Barth et al. 2003). A growing body of literature suggests that investors differently value the same information when it is presented in different forms, reacting more strongly to income statement recognition than to footnote disclosures (Espahbodi et al. 2002), to balance sheet-recognized derivatives than to disclosed derivatives (Ahmed et al. 2006), to realized gains and losses from the sale of available-for-sale securities even after controlling for previously recorded unrealized gains and losses in other comprehensive income (Dong, Ryan, and Zhang 2014), and to gains from debt-equity swaps included in later earnings announcement than to gains in the previously disclosed swap announcement

(Hand 1990).³ Since investors and regulators view core earnings as an important metric for evaluating a firm's ongoing business, firms may opportunistically shift operating expenses to non-operating expenses or discontinued operations to boost core earnings (Cready et al. 2010; Yun et al. 2010; Barua et al. 2010; McVay 2006), but stock prices may fail to fully reflect the information content of these managed core earnings (Alfonso et al. 2015) or excluded expenses (Christensen et al. 2014; Doyle et al. 2003).

More relevant to this paper is the capital markets research in accounting that examines how the placement of information in financial statements affects its valuation implications. Bartov and Mohanram (2014) find evidence that the stock market response to the same line item varies with its location in the income statement. Bhattacharya et al. (2003) and Bradshaw and Sloan (2002) show that earnings components in Street earnings receive more market emphasis than those in GAAP earnings. Additionally, nonprofessional investors weight information more heavily when it is presented in a statement of comprehensive income than when it appears in a statement of stockholders' equity (Maines and McDaniel 2000) and weight other comprehensive income more heavily when it is presented in a statement of changes in equity, rather than in a statement of financial performance (Chambers et al. 2007). Research suggests that, holding information content the same, the position of the information matters.

While the literature on firms' earnings management and investors' pricing of accounting information often evolve independently, we analyze both firm and investor behaviors using a unique regulatory setting in China in 2007 that moves investment income from below the line of operating income in the income statement to above it. We explore whether the stock market fully incorporates the information contained in investment income when its location change in the income statement could induce firms to alter their behavior and modify the information content of investment income.

2.2 Regulatory background on investment income

On February 15, 2006, the Ministry of Finance of the People's Republic of China (PRC) announced the issuance of the Accounting Standards for Business Enterprises (ASBE), which became mandatory for listed Chinese enterprises on January 1, 2007. The new ASBE require changes to certain accounting policies of recognition and measurement from the old Accounting Regulations for Business Enterprises (referred to as the "Old GAAP") as well as to the presentation of financial statements. The new standards add a statement of changes in owners' equity and eliminate the old statement of profit appropriation while retaining the balance sheet, income statement, and cash flow statement. The adoption of the new ASBE results in substantial convergence between Chinese accounting standards and IFRS, except for certain modifications that reflect China's unique circumstances and environment.⁴ In addition to making changes in the measurement and recognition of certain accounts in the financial statements, the

³ However, some studies argue that the differing market reactions to disclosed items versus recognized items are attributable not to the form of presentation but to the reliability of disclosures, institutional ownership, or analyst following (Britten et al. 2013; Yu 2013).

⁴ Some key differences are that ASBE 8 prohibits the reversal of all impairment losses (whereas the International Accounting Standards allow the reversal of most impairment losses) and state-controlled entities are not all regarded as related parties simply because they are controlled by the state (since all state-owned Chinese companies are independent legal persons).

new standards require a different format for presenting income statement items.⁵ The major changes to the format of the income statement are that investment income and unrealized gains/losses from trading securities now appear above the line of operating income, whereas previously investment income was below the line of operating income and the item of unrealized gains/losses from trading securities did not exist under the Old GAAP, which did not adopt the concept of fair value accounting.⁶ The new ASBE regard these two items as income from operating activities and as a part of firms' core operating performance.⁷ In this paper, we consider investment income because it is available in both periods, whereas unrealized gains/losses from trading securities are available only in the post-regulation period.

Under the new Chinese ASBE, investment income is composed of profits/losses from three categories of business transactions: (1) profits/losses related to associates and joint ventures, (2) profits/losses from disposal or sale of financial assets and long-term equity investments, and (3) cash dividend income from financial assets and long-term equity investments under the cost method as well as interest income from debt securities.⁸ The first category primarily includes profits/losses from investments in associates and joint ventures under the equity method and is separately listed under the total amount of investment income in the income statement. The last two categories include the disposal gains/losses from all types of securities and investments and the income from financial assets and equity investments that are not related to associates and joint ventures. The last two categories are not specifically listed in the income statement but can be derived as investment income minus profits/losses related to associates and joint ventures. Appendix 2 illustrates how investment income is presented in the income statement before and after the issuance of new accounting standards. The amount of profits/losses from the disposal or sale of investments is strongly subject to management discretion since firms can cherry-pick the timing and type of investments for sale. The Split-Share Structure Reform, which makes nontradable shares gradually tradable over time after 2006, lends convenience to the discretionary sale of financial securities or equity investments.⁹

⁵ The Securities Regulatory Committee of China requires all companies in China, except financial firms, to follow the same format in preparing financial statements with identical account names in both the pre- and post-regulatory change period.

⁶ The other changes to the format of the income statement involve new requirements for presenting comprehensive income and the position of reporting minority interests.

⁷ See page 520 of the Interpretation Guidance of Chinese Accounting Standards (2010), which is published by the Accounting Regulatory Department of the Ministry of Finance. This interpretation guidance offers detailed explanations and specific examples for the standards.

⁸ Under the Old GAAP, investment income covers almost the same categories of business transactions, except that the major investments are debt and equity securities investments without the concept of financial assets or financial liabilities. Additionally, when short-term investments drop in value below cost, the impairment loss is included in investment income and increase in market value is not recognized.

⁹ A split-share structure was adopted when firms first issued stock in the domestic Chinese market. While shares owned by individuals are tradable in the stock market, shares owned by state and legal persons are nontradable, accounting for two-thirds of total shares. In April 2005, to better align the interests of block and minority shareholders, the Chinese government initiated a reform to convert all nontradable shares into tradable shares. By the end of 2007, over 97% of total Chinese A-share firms had completed the reform (Li et al. 2011). However, after a firm completes the reform, the originally nontradable shares are subject to lock-up periods of 12 months or longer depending on the ownership of the nontradable shares. When shares of listed firms become tradable, managers have larger discretion over selling such newly tradable shares to manage investment income.

In sum, this regulatory change mandates that all firms shift investment income into operating income. Given that firms can time the disposal of investments and long-lived assets (Bartov 1993; Dechow and Shakespeare 2009), the appearance of investment income in an important place in the income statement post-regulation could induce management to manipulate the amount of investment income, thus changing the information content of investment income and operating income. We use this regulatory setting to examine how firms react to the regulation change and how investors price the information in investment income as a result.

3 Sample and variable measurement

Our sample period spans from 2000 to 2015: the pre-regulation period of 2000–2006 and the post-regulation period of 2007–2015. The sample period ends in 2015 because our tests require one-year future return data after the 2015 financial statements become available. It begins in 2000 because the sample size is considerably smaller in the 1990s. We obtain stock return and financial data from CSMAR databases that are available from Wharton Research Data Services (WRDS).¹⁰ We exclude financial firms and require nonmissing investment income and core earnings. Our final sample consists of 26,239 firm-year observations with nonmissing investment income and core earnings over the 2000–2015 sample period.

Our primary variable of interest is investment income (*INVEST*), which is separately listed above operating income from fiscal year 2007 on and listed below operating income before 2007. Prior to 2007, investment income includes impairment in short-term investments, whereas in the post-2007 period, impairment in short-term investments is reflected in unrealized gains and losses and is separated from investment income. To maintain consistency before and after 2007, we hand-collect impairment in short-term investments and subtract it from investment income in the pre-2007 period. We define core earnings (*CORE*) as operating income prior to 2007 and as operating income excluding investment income and unrealized gains and losses from trading securities from 2007 on.¹¹ We subtract *INVEST* and *CORE* from total profit before tax (*TP*) to derive other income (*OTHER*).¹²

Investment income is decomposed into two components: investment income related to associates and joint ventures (*INVEST_JV*) and other investment income (*INVEST_OTHER*). The former is separately listed under the category of investment income, and we subtract it from total investment income to derive other investment income (*INVEST_OTHER*). We scale all financial variables by average total assets. Each year, all financial variables are winsorized at 1 and 99%.

¹⁰ As of September 2017, WRDS has financial data up to 2014 and return data up to 2015, so we supplement the WRDS data with the 2015 financial data and obtain the 2016/2017 return data directly from CSMAR. WRDS is expected to include such data sets in the near future.

¹¹ To maintain consistency, CSMAR adjusts operating income retroactively as if operating income includes investment income throughout the database. To derive core earnings throughout the years, we subtract investment income from operating income recorded in the CSMAR database.

¹² We focus on pre-tax total profit to avoid any complications caused by tax factors. This approach is consistent with listing investment income in the income statement on a pre-tax basis.

In the stock return tests, the main variables of interest are contemporaneous annual stock returns (RET_t) and one-year-ahead future stock returns (RET_{t+1}). RET_t (RET_{t+1}) is calculated as cumulative 12-month returns starting from the fifth month in calendar year t ($t+1$) to the fourth month of calendar year $t+1$ ($t+2$). As all Chinese firms have December 31 as their fiscal year-end, annual stock returns are measured from May of the current year to April of the following year. The control variables in various return tests include market value of equity at the fiscal year-end ($SIZE$), book-to-market ratio (BM) at the fiscal year-end, and price momentum ($PMOM$) measured as the cumulative six-month returns with a one-month lag, relative to the corresponding one-year return window (from October of year t to March of year $t+1$, relative to RET_{t+1}). We use Big Four auditors (dummy variable $BIG4$) and the number of analysts following a firm (COV) to proxy for external monitoring and use the number of directors on a board ($BOARDSIZE$) to proxy for internal monitoring. Each year, all variables except return variables are winsorized at 1 and 99%. Please see Appendix 1 for detailed variable definitions.

Table 1 reports descriptive statistics of key variables for the pre- and post-regulation periods separately. Panel A indicates that the mean core earnings are 2.3 and 3.0% of average total assets, and investment income is 0.3 and 0.8% of average total assets in the pre- and post-regulation periods, respectively. These results imply that securities and equity investments may constitute an important business operation of Chinese companies and contribute significantly to total earnings. Investment income is right-skewed, consistent with its nonrecurring nature and managerial discretion. Panel B provides the correlation matrix. Both Pearson and Spearman correlations show that $INVEST$ has a significantly negative association with future one-year returns in both periods. $INVEST$ is positively correlated with $CORE$ in the pre-regulation period but is negatively correlated with $CORE$ in the post-regulation period. Market capitalization and book-to-market have significant correlations with future one-year returns in the expected directions as documented in the literature. $PMOM$ has a negative correlation with future one-year returns, a result that is not unusual in annual returns.

4 Main empirical results

4.1 Firm response to the regulatory change

In this section, we first document the relative importance of investment income as a component of total earnings over different periods. Figure 1 depicts the magnitude of aggregate investment income across all firms, relative to aggregate core earnings in each year of the sample period. The figure shows that, starting from 2007, investment income increases sharply and accounts for between 17 and 46% of core earnings, implying that investment accounts for a significant portion of business activities and regularly generates profits. In contrast, investment income averages around 10% of the core earnings in the pre-regulation period, with relatively high values in 2000 and 2001 and a negative value in 2005.

Table 1 Descriptive statistics

Panel A: Descriptivtwise Statistics						
Variable	Mean	Stddev	Q1	Median	Q3	
RET_{t+1}	0.362	1.237	-0.288	-0.102	0.369	
$CORE_t$	0.023	0.080	0.004	0.029	0.061	
$INVEST_t$	0.003	0.017	-0.001	0.000	0.005	
$OTHER_t$	-0.002	0.024	-0.001	0.000	0.003	
$SIZE_t$	2.860	3.432	1.074	1.838	3.220	
BM_t	0.442	0.341	0.237	0.406	0.618	
$PMOM_t$	0.145	0.452	-0.134	0.024	0.249	
Panel B: Pearson (above) and Spearman (below) Correlations of Key Variables						
	RET_{t+1}	$CORE_t$	$INVEST_t$	$OTHER_t$	$SIZE_t$	BM_t
Pre-regulation period (2000–2006)						
RET_{t+1}	1	-0.06**	-0.11**	-0.04**	-0.13**	0.33**
$CORE_t$	0.08**	1	0.12**	0.36**	0.32**	0.24**
$INVEST_t$	-0.09**	0.01	1	0.18**	0.12**	0.03**
$OTHER_t$	-0.03**	0.02	0.13**	1	0.07**	0.26**
$SIZE_t$	-0.18**	0.42**	0.22**	0.07**	1	-0.04**
BM_t	0.37**	0.03**	-0.03**	0.02	-0.17**	1
$PMOM_t$	-0.07**	0.16**	0.07**	0.07**	0.08**	0.11**
Post-regulation period (2007–2015)						
RET_{t+1}	1	-0.05**	-0.03**	0.03**	-0.12**	0.19**
$CORE_t$	-0.04**	1	-0.18**	-0.24**	0.22**	-0.03**
$INVEST_t$	-0.05**	-0.11**	1	0.02*	0.03**	-0.03**

Table 1 (continued)

<i>OTHER_t</i>	0.02**	-0.09**	-0.03**	1	-0.04**	-0.11**	0.01
<i>SIZE_t</i>	-0.28**	0.29**	0.18**	-0.04**	1	0.03**	-0.04**
<i>BM_t</i>	0.19**	-0.09**	0.06**	-0.10**	-0.11**	1	-0.06**
<i>PMOM_t</i>	0.00	-0.03**	0.00	0.03*	-0.05**	-0.04**	1

Panel A reports descriptive statistics, and Panel B reports the correlations of key variables. RET_{t+i} is future one-year-ahead return starting from the fifth month after a firm's fiscal year-end. $CORE_t$ is computed as operating income excluding investment income scaled by average total assets (prior to 2007) and as operating income excluding investment income and unrealized gains and losses from trading securities scaled by average total assets (from 2007 on). $INVEST_t$ is investment income as of the fiscal year-end scaled by average total assets. $OTHER_t$ is other earnings, computed as total profits minus core earnings and investment income. $SIZE_t$ is the market value of equity as of the fiscal year-end. BM_t is the book value of equity as of the fiscal year-end scaled by the market value of equity as of the fiscal year-end. $PMOM_t$ is price momentum, measured as the cumulative six-month returns with a one-month lag, relative to the future return window. Each year, all variables, except for return variables, are winsorized at 1 and 99%. ** and * indicate significance at the 1 and 5% levels, respectively. The sample consists of 8,202 and 18,037 firm-year observations with nonmissing investment income ($INVEST$) and core earnings ($CORE$) for the pre-regulation (2000–2006) and post-regulation (2007–2015) periods, respectively. Please see Appendix 1 for detailed variable definitions

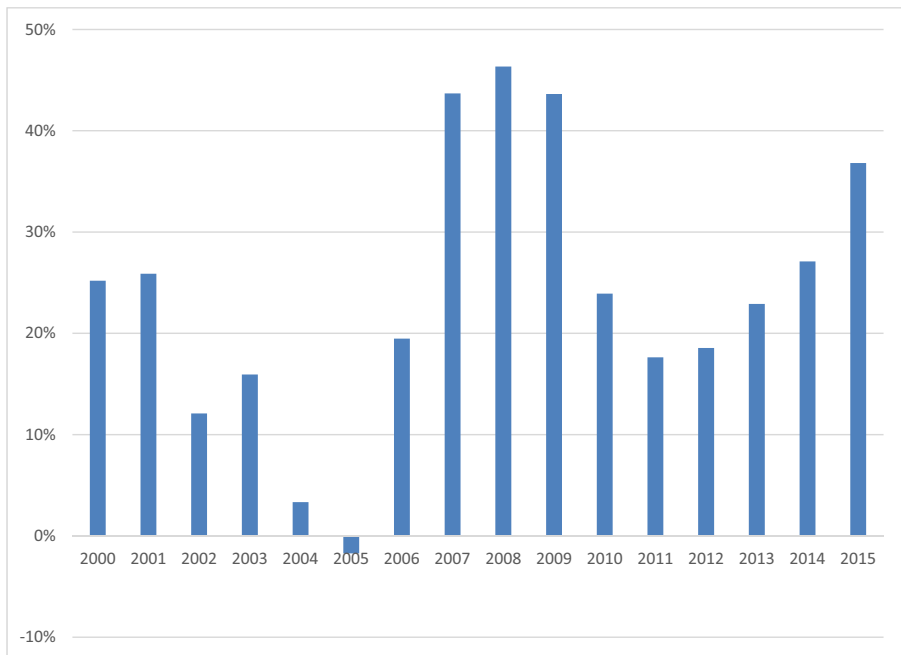


Fig. 1 Time-series pattern of aggregate investment income to aggregate core earnings. Figure 1 presents the ratio of aggregated investment income to aggregated core earnings. The individual firm's core earnings are computed as operating income scaled by average total assets (prior to 2007) and as operating income excluding investment income and unrealized gains and losses from trading securities scaled by average total assets (from 2007 on). The individual firm's investment income is investment income as of the fiscal year-end scaled by average total assets. In 2007, the regulation changes the reporting of investment income. Prior to 2007, investment income is excluded from operating income and is listed below the line of the operating income. Starting from fiscal year 2007, investment income is a part of operating income and is listed above the line of operating income. Each year, both investment income and core earnings are winsorized at 1 and 99%. The sample consists of 26,239 firm-year observations with nonmissing investment income or core earnings over the sample period of 2000–2015. Please see Appendix 1 for detailed variable definitions

We formally test the relationship between investment income and core earnings by estimating the following model, where the regression is run annually and the Fama-MacBeth *t*-statistics are adjusted for Newey-West autocorrelations of three lags.

$$INVEST_t = \beta_0 + \beta_1 CORE_t + \beta_2 CONTROLS + \varepsilon_t. \quad (1)$$

Panel A of Table 2 tabulates the statistical results from univariate regressions of investment income on core earnings each year over the whole sample period. Strikingly, for every year in the post-regulation period of 2007–2015, investment income and core earnings have a negative correlation, in contrast to a positive correlation for every year in the pre-regulation period of 2000–2006. The Fama-MacBeth coefficient on *CORE* is 0.023, with a *t*-statistic of 3.85 in the pre-regulation period. The positive correlation in the pre-regulation period suggests that core earnings co-move with profits/losses from investments owing to economy- or industry-wide factors or both. The correlation between investment income and core earnings is negative and highly significant every year in the post-regulation period, with an average coefficient on

Table 2 Regressions of investment income on core earnings

Year	Intercept	$CORE_t$	Adj. R ²	Year	Intercept	$CORE_t$	Adj. R ²
Panel A: Annual OLS Regression: $INVEST_t = \beta_0 + \beta_1 CORE_t + \epsilon_t$							
Pre-regulation period (2000–2006)							
2000	0.009 (11.82)	0.006 (0.68)	-0.001	2007	0.014 (19.28)	-0.048 (-6.34)	0.027
2001	0.005 (8.71)	0.029 (4.21)	0.016	2008	0.008 (15.56)	-0.024 (-4.76)	0.014
2002	0.002 (4.41)	0.029 (5.08)	0.022	2009	0.010 (17.37)	-0.030 (-5.25)	0.017
2003	0.003 (8.05)	0.011 (2.28)	0.003	2010	0.012 (19.66)	-0.065 (-9.39)	0.048
2004	-0.000 (-0.22)	0.038 (7.19)	0.039	2011	0.009 (19.23)	-0.047 (-8.13)	0.031
2005	-0.001 (-2.07)	0.044 (7.80)	0.043	2012	0.008 (21.87)	-0.051 (-10.37)	0.044
2006	0.005 (9.02)	0.004 (0.62)	-0.000	2013	0.009 (23.87)	-0.050 (-9.63)	0.037
				2014	0.010 (26.11)	-0.062 (-11.33)	0.049
				2015	0.010 (25.41)	-0.052 (-9.41)	0.033
Fama-MacBeth	0.003 (2.56)	0.023 (3.85)	0.017	Fama-MacBeth	0.010 (14.96)	-0.048 (-10.67)	0.033
Panel B: Fama-MacBeth Regression: $INVEST_t = \beta_0 + \beta_1 CORE_t + CONTROLS + \epsilon_t$							
Pre-regulation (2000–2006)							
Regression	Predicted sign	Coefficient (t-stat)	Post-regulation (2007–2015)	Predicted sign	Coefficient (t-stat)		
Intercept		0.002 (1.13)			0.007 (3.16)		
$CORE_t$	+	0.015 (2.54)		-	-0.048 (-7.81)		
$SIZE_{t-1}$	+	0.0003 (2.53)		+	0.0002 (3.38)		
BM_{t-1}		-0.003 (-1.78)			-0.006 (-4.42)		
$RET12_{t-1}$	+	0.006 (6.29)		+	0.003 (4.27)		
$INVEST_{t-1}$	+	0.051 (4.93)		+	0.147 (5.83)		
$LOSS_{t-1}$		-0.002 (-1.49)			0.001 (0.40)		

Table 2 (continued)

<i>Industry</i>	Yes	Yes
Adj. R ²	0.132	0.146

Panel A reports statistic results from OLS regressions for every year in the pre- and post-regulation periods. Fama-MacBeth regression coefficient and Newey-West adjusted t-statistics (lag = 3) are shown at the bottom. Panel B reports Fama-MacBeth regression results with Newey-West adjusted t-statistics (lag = 3), including control variables and industry effects (based on one-digit code of CSRC's definition in 2012). $CORE_t$ is computed as operating income excluding investment income scaled by average total assets (prior to 2007) and as operating income excluding investment income and losses from trading securities scaled by average total assets (from 2007 on). $INVEST_t$ is investment income as of the fiscal year-end scaled by average total assets. $SIZE_{t-1}$ is the market value of equity at the end of fiscal year t-1. BM_{t-1} is the book-to-market ratio, calculated as the book value of equity scaled by the market value of equity at the end of fiscal year t-1. $Ret12$ is cumulative stock returns over the 12-month period starting from January to December in a firm's fiscal year. $INVEST_{t-1}$ is investment level at the end of fiscal year t-1 scaled by average total assets. $LOSS_{t-1}$ is a dummy variable indicating loss firms at the end of fiscal year t-1. Regulation changes in 2007 affect the reporting of investment income. Prior to 2007, investment income is excluded from operating income and listed below the line of the operating income. Starting from fiscal year 2007, investment income is a part of operating income and listed above the line of operating income. Each year, all variables except for return variables are winsorized at 1 and 99%. The sample consists of 8,202 and 18,037 firm-year observations with nonmissing investment income ($INVEST$) and core earnings ($CORE$) for the pre-regulation (2000–2006) and post-regulation (2007–2015) periods, respectively. Please see Appendix 1 for detailed variable definitions

CORE of -0.048 and a Fama-MacBeth *t*-statistic of -10.67 . Additionally, we find the intercept in the post-regulation period (0.010) to be over three times the intercept in the pre-regulation period (0.003), suggesting that firms tend to report a higher magnitude of investment income independent of core earnings in the post-regulation period. In Panel B, we include control variables of firm size, book-to-market ratio, prior year stock returns, investment level, an indicator of loss firms, and fixed industry effects (one-digit code of CSRC's industry definition in 2012). We find that the coefficients on our main variable of interest are little changed.

Figure 2 plots the yearly coefficients from Eq. (1) throughout the entire sample period. The sharp comparison in the correlation between the pre- and post-regulation periods indicates that firms change their investment activities in the post-regulation period and tend to recognize high investment income when core earnings are low and vice versa. After the regulation change, investment income becomes a part of operating income, which gives firms the incentive to opportunistically recognize investment income. Our results are consistent with the evidence in Graham et al.'s (2005) survey that 96.9% of the respondents prefer a smooth earnings path and with the evidence in He et al. (2012) that managers selectively sell available-for-sale securities to meet regulatory earnings targets.

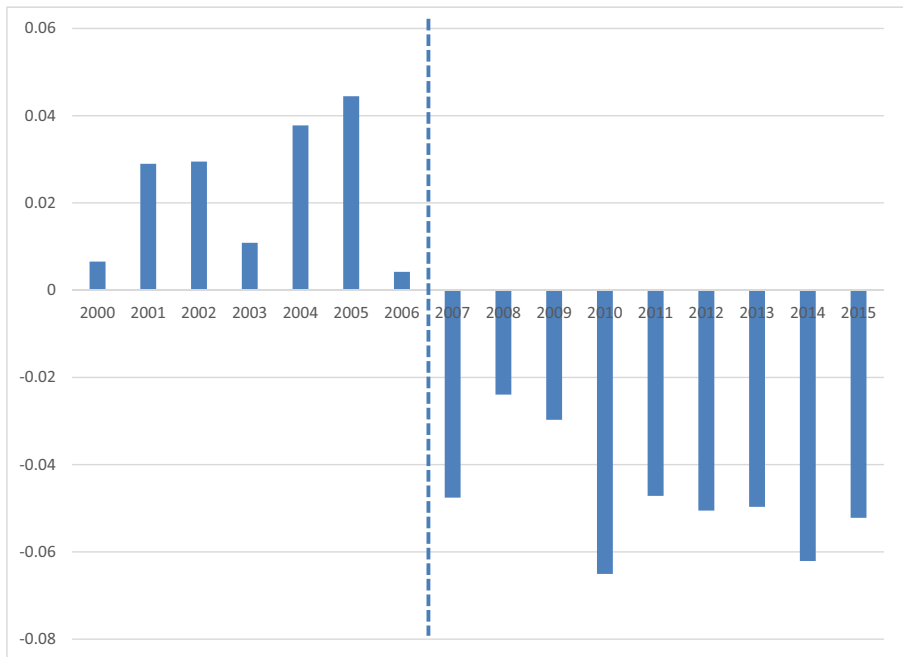


Fig. 2 Time-series pattern of the correlation between investment income and core earnings. Figure 2 presents yearly coefficient estimates from regressions of investment income (*INVEST*) on core earnings (*CORE*). *CORE* is computed as operating income excluding investment income scaled by average total assets (prior to 2007) and as operating income excluding investment income and unrealized gains and losses from trading securities scaled by average total assets (from 2007 on). *INVEST* is investment income as of the fiscal year-end scaled by average total assets. Each year, both *INVEST* and *CORE* are winsorized at 1 and 99%. The sample consists of 26,239 firm-year observations with nonmissing investment income (*INVEST*) or core earnings (*CORE*) over the sample period of 2000–2015. Please see Appendix 1 for detailed variable definitions

4.2 Investor response to the regulatory change

If firms change investment decisions and opportunistically manage investment income following the regulatory change, the information content of investment income will differ from that in the pre-regulation period. In this section, we examine how the stock market prices investment income in the pre- and post-regulation periods. We use valuation implications of core earnings (*CORE*) as the benchmark in a quasi-difference-in-difference setting and compare investor response to investment income (*INVEST*) and core earnings (*CORE*) in the pre- and post-regulation periods. Specifically, we estimate the following models by running regressions annually for each of our two sample periods.

$$RET_t = \beta_0 + \beta_1 CORE_t + \beta_2 INVEST_t + \beta_3 OTHER_t + \beta_4 CONTROL_{t-1} + \varepsilon_t. \quad (2)$$

$$RET_{t+1} = \beta_0 + \beta_1 CORE_t + \beta_2 INVEST_t + \beta_3 OTHER_t + \beta_4 CONTROL_t + \varepsilon_{t+1}. \quad (3)$$

Equation (2) tests the stock market response to contemporaneous information in earnings components in the pre- and post-regulation periods, and Eq. (3) tests whether the market fully incorporates information in investment income and other earnings components in the two sample periods. In the contemporaneous equation, we expect the coefficients on *CORE*, *INVEST*, and *OTHER* to be positive, indicating that the stock market responds positively to earnings news. In the regressions of future stock returns, insignificant coefficients on earnings components suggest that the stock prices fully incorporate earnings information, whereas significant coefficients on earnings components indicate market inefficiency.

Table 3 reports Fama-MacBeth coefficients and t-statistics from yearly regressions of contemporaneous annual returns on earnings components and control variables for the pre- and post-regulation periods, respectively. The coefficients on core earnings (*CORE*) and investment income (*INVEST*) are significantly positive in both periods, indicating that the stock market positively values profits from the core business and investments.¹³ Other earnings (*OTHER*) also have a positive association with contemporaneous returns, but the coefficient is significant only in the post-regulation period. The coefficients on control variables indicate that stock returns are negatively correlated with firm size and positively correlated with the book-to-market ratio, consistent with findings regarding the Fama-French (1992) factors. Price momentum in the past six months has a negative correlation with annual stock returns. We further include changes in earnings components as additional explanatory variables in Eq. (2). With both

¹³ As core earnings tend to be more persistent than investment income, we expect the coefficient on core earnings to be greater than that on investment income. A larger coefficient on investment income in the pre-regulation period turns out to be somewhat surprising. While core earnings closely follow a normal distribution, investment income is right-skewed with many observations of zero value. To address the concern of extreme values, we substitute actual values of *CORE*, *INVEST*, and *OTHER* with their percentile rankings converted to a [0, 1] scale. Untabulated analysis shows that the coefficients of *CORE*, *INVEST*, and *OTHER* are 0.260, 0.150, and 0.029, respectively, a monotonic pattern, consistent with our priors.

Table 3 Regressions of contemporaneous annual stock returns on investment income

Regression	Pre-regulation (2000–2006)		Post-regulation (2007–2015)	
	Predicted sign	Coefficient (t-stat)	Predicted sign	Coefficient (t-stat)
Intercept		0.327 (0.76)		0.187 (1.32)
$CORE_t$	+	0.671 (1.58)	+	0.777 (3.88)
$INVEST_t$	+	2.431 (2.69)	+	0.672 (2.21)
$OTHER_t$	+	0.517 (1.23)	+	1.264 (3.21)
$\Delta CORE_t$	+	1.526 (2.17)	+	1.177 (3.82)
$\Delta INVEST_t$	+	0.785 (1.46)	+	1.271 (2.73)
$\Delta OTHER_t$	+	-0.494 (-1.82)	+	0.132 (0.62)
$SIZE_{t-1}$		-0.022 (-1.60)		-0.005 (-2.94)
BM_{t-1}		0.141 (4.77)		0.041 (0.63)
$PMOM_{t-1}$		-0.127 (-1.03)		-0.058 (-2.64)
Adj. R ²		0.165		0.078
				0.096

The table reports the average coefficient estimates and Fama-MacBeth t-statistics with Newey-West adjustment (lag=3). We run the regression annually for the pre- and post-regulation periods. RET_t is contemporaneous one-year return starting from the fifth month of a firm's fiscal year to the fourth month after fiscal year-end. $CORE_t$ is computed as operating income excluding investment income scaled by average total assets (prior to 2007) and as operating income excluding investment income and unrealized gains and losses from trading securities scaled by average total assets (from 2007 on). $INVEST_t$ is investment income as of the fiscal year-end scaled by average total assets. $OTHER_t$ is other earnings and computed as $TP_t - CORE_t - INVEST_t$ prior to 2007 and as $TP_t - CORE_t - INVEST_t - Unrealized\ trading\ gain/loss\ post\ 2007$. TP_t is pre-tax total profit reported as of the fiscal year-end scaled by average total assets. $SIZE_{t-1}$ is the market value of equity as of the fiscal year-end t-1. BM_{t-1} is the book value of equity as of the fiscal year-end scaled by the market value of equity as of the fiscal year-end. $PMOM_{t-1}$ is price momentum, measured as the cumulative six-month returns with a one-month lag, relative to the contemporaneous return window. Prior to 2007, investment income is excluded from operating income and listed below the line of the operating income. Starting from fiscal year 2007, investment income is a part of operating income and listed above the line of operating income. Each year, all variables except return variables are winsorized at 1 and 99%. The sample consists of 8,202 and 18,037 firm-year observations with nonmissing investment income ($INVEST$) and core earnings ($CORE$) for the pre-regulation (2000–2006) and post-regulation (2007–2015) periods, respectively. Please see Appendix 1 for detailed variable definitions

$$RET_t = \beta_0 + \beta_1 CORE_t + \beta_2 INVEST_t + \beta_3 OTHER_t + \beta_4 CONTROL_{t-1} + \epsilon_t \quad (2)$$

Table 4 Regressions of future one-year-ahead stock returns on investment income

Regression	Pre-regulation (2000–2006)			Post-regulation (2007–2015)		
	Predicted sign	Coefficient (t-stat)	Coefficient (t-stat)	Predicted sign	Coefficient (t-stat)	Coefficient (t-stat)
Intercept		0.261 (0.64)	0.258 (0.63)		0.232 (1.55)	0.229 (1.52)
$CORE_t$	0	-0.239 (-0.30)	-0.266 (-0.30)	0	-0.125 (-0.53)	-0.077 (-0.28)
$INVEST_t$	0	-0.682 (-0.96)	-1.036 (-0.80)	-	-0.693 (-2.25)	-0.842 (-2.59)
$OTHER_t$	0	-0.113 (-0.33)	-0.593 (-1.50)	0	-0.190 (-0.70)	0.056 (0.12)
$\Delta CORE_t$			0.136 (0.49)			-0.098 (-0.65)
$\Delta INVEST_t$			0.589 (0.63)			0.297 (1.22)
$\Delta OTHER_t$			0.599 (0.94)			-0.258 (-1.09)
$SIZE_t$		-0.005 (-0.61)	-0.005 (-0.60)		-0.005 (-2.62)	-0.005 (-2.59)
BM_t		0.156 (2.77)	0.163 (2.45)		0.046 (0.62)	0.044 (0.61)
$PMOM_t$		0.026 (0.27)	0.015 (0.14)		-0.039 (-1.18)	-0.037 (-1.09)
Adj. R ²		0.078	0.081		0.057	0.057

The table reports Fama-MacBeth regression results with Newey-West adjusted t-statistics (lag = 3). The coefficient estimates are the average of annual estimates over seven years for the pre- and post-regulation periods, respectively. RET_{t+j} is future one-year-ahead return starting from the fifth month after a firm's fiscal year-end. $CORE_t$ is computed as operating income excluding investment income scaled by average total assets (prior to 2007) and as operating income excluding investment income and unrealized gains and losses from trading securities scaled by average total assets (from 2007 on). $INVEST_t$ is investment income as of the fiscal year-end scaled by average total assets. $OTHER_t$ is other earnings and computed as $TP_t - CORE_t - INVEST_t$ prior to 2007 and as $TP_t - CORE_t - INVEST_t - Unrealized\ trading\ gain/loss$ post 2007. TP_t is pre-tax total profit reported as of the fiscal year-end scaled by average total assets. $SIZE_t$ is the market value of equity as of the fiscal year-end. BM_t is the book value of equity as of the fiscal year-end scaled by the market value of equity as of the fiscal year-end. $PMOM_t$ is price momentum, measured as the cumulative six-month returns with a one-month lag, relative to the future return window. Prior to 2007, investment income is excluded from operating income and listed below the line of the operating income. Starting from fiscal year 2007, investment income becomes part of operating income and is listed above the line of operating income. Each year, all variables except for return variables are winsorized at 1 and 99%. The sample consists of 8,202 and 18,037 firm-year observations with nonmissing investment income ($INVEST$) and core earnings ($CORE$) for the pre-regulation (2000–2006) and post-regulation (2007–2015) periods, respectively. Please see Appendix 1 for detailed variable definitions

Table 5 Regressions of future stock returns on positive and negative investment income

Regression	Pre-regulation (2000–2006)			Post-regulation (2007–2015)		
	Predicted sign	Coefficient (t-stat)	Coefficient (t-stat)	Predicted sign	Coefficient (t-stat)	Coefficient (t-stat)
Intercept		0.262 (0.64)	0.259 (0.63)		0.232 (1.55)	0.229 (1.52)
$CORE_t$	0	-0.245 (-0.30)	-0.269 (-0.30)	0	-0.127 (-0.54)	-0.078 (-0.29)
$POSINVEST_t$	0	-0.995 (-0.98)	-1.228 (-0.87)	-	-0.715 (-2.21)	-0.860 (-2.58)
$NEGINVEST_t$	0	-0.568 (-0.68)	-0.968 (-0.69)	0	0.481 (0.42)	-0.662 (-0.58)
$OTHER_t$	0	-0.093 (-0.27)	-0.562 (-1.33)	0	-0.188 (-0.69)	0.058 (0.13)
$\Delta CORE_t$			0.141 (0.50)			-0.097 (-0.65)
$\Delta INVEST_t$			0.571 (0.62)			0.290 (1.16)
$\Delta OTHER_t$			0.585 (0.92)			-0.259 (-1.10)
$SIZE_t$		-0.005 (-0.62)	-0.005 (-0.60)		-0.005 (-2.62)	-0.005 (-2.59)
BM_t		0.159 (2.77)	0.166 (2.46)		0.046 (0.62)	0.045 (0.61)
$PMOM_t$		0.026 (0.28)	0.015 (0.14)		-0.039 (-1.18)	-0.037 (-1.09)
Adj. R ²		0.078	0.081		0.056	0.057

The table reports Fama-MacBeth regression results with Newey-West adjusted t-statistics (lag = 3). The coefficient estimates are the average of annual estimates over seven years for the pre- and post-regulation periods, respectively. RET_{t+i} is future one-year-ahead return starting from the fifth month after a firm's fiscal year-end. $CORE_t$ is computed as operating income excluding investment income scaled by average total assets (prior to 2007) and as operating income excluding investment income and unrealized gains and losses from trading securities scaled by average total assets (from 2007 on). $INVEST_t$ is investment income as of the fiscal year-end scaled by average total assets. $POSINVEST$ equals $INVEST$ if $INVEST$ is nonnegative and 0 otherwise. $NEGINVEST$ equals $INVEST$ if $INVEST$ is negative and 0 otherwise. $OTHER_t$ is other earnings and computed as $TP_t - CORE_t - INVEST_t$ prior to 2007 and as $TP_t - CORE_t - INVEST_t - Unrealized trading gain/loss$ post 2007. TP_t is pre-tax total profit reported as of the fiscal year-end scaled by average total assets. $SIZE_t$ is the market value of equity as of the fiscal year-end. BM_t is the book value of equity as of the fiscal year-end scaled by the market value of equity as of the fiscal year-end. $PMOM_t$ is price momentum, measured as the cumulative six-month returns with a one-month lag, relative to the future return window. Prior to 2007, investment income is excluded from operating income and listed below the line of the operating income. Beginning with fiscal year 2007, investment income becomes part of operating income and is listed above the line of operating income. Each year, all variables except for return variables are winsorized at 1 and 99%. The sample consists of 8,202 and 18,037 firm-year observations with non-missing investment income ($INVEST$) and core earnings ($CORE$) for the pre-regulation (2000–2006) and post-regulation (2007–2015) periods, respectively. Please see the appendix 1 for detailed variable definitions

levels and changes variables in the model, some coefficients may turn out to be negative. Table 3 shows that the coefficients on levels and changes of earnings components are generally positive.

Table 4 assesses any misvaluation in investment income and other earnings components in pre- and post-regulation periods. The estimated coefficients and associated t-statistics are from Fama-MacBeth (1973) cross-sectional regressions of one-year-ahead returns on earnings components with Newey-West adjustment (lag = 3). The insignificant coefficients on *CORE* and *OTHER* in both periods provide no evidence of any over- or underreaction to core earnings or other earnings reported in year t . *INVEST* also has an insignificant coefficient in the pre-regulation period, suggesting that the market's reaction to investment income is complete prior to the regulation change. However, the coefficient on *INVEST* becomes highly significant and negative in the post-regulation period, with a Fama-MacBeth coefficient estimate of -0.693 and t-statistic of -2.25 . The negative coefficient of -0.693 is similar in magnitude to the coefficient in the contemporaneous regression (0.672) observed in the post-regulation period in Table 3, with opposite signs, suggesting that the reaction to investment income in year t is entirely reversed in the subsequent year. The inclusion of changes in earnings components as additional explanatory variables does not alter the picture. These findings suggest that, post regulation, investors overreact to information in investment income in the contemporaneous year and that the overreaction is corrected in the subsequent year.

Intuitively, firms have stronger incentives to manage earnings upward, suggesting that positive investment income should have a stronger relationship with future stock returns than negative investment income. To test this idea, we replace *INVEST* in regression models in Table 4 with two variables, *POSINVEST* and *NEGINVEST*, which represent *INVEST* when it is positive and negative, respectively, and zero otherwise. Table 5 reports empirical results. Consistent with our expectation, we find that our results are driven by *POSINVEST*. While *POSINVEST* has negative and significant coefficients in the post-regulation period, the coefficients on *NEGINVEST* are indistinguishable from zero.

Finally, we perform the Mishkin test following Sloan (1996). Specifically, we estimate the following earnings and pricing models and then test whether the coefficient estimates on earnings components are similar between these two models.

$$\text{Earnings model: } TP_{t+1} = \gamma_0 + \gamma_1 CORE_t + \gamma_2 INVEST_t + \gamma_3 OTHER_t + \varepsilon_{t+1}, \quad (4)$$

$$\text{Pricing model: } RET_{t+1} = \beta (TP_{t+1} - \gamma_0 - \gamma_1 * CORE_t - \gamma_2 * INVEST_t - \gamma_3 * OTHER_t) + \theta_{t+1}, \quad (5)$$

where TP_{t+1} is pre-tax total profit in year $t+1$ reported as of the fiscal year-end scaled by average total assets and other variables are defined as before. As earnings measures in China tend to contain substantial noise, we follow Sloan (1996) and use percentile rankings of all earnings variables in both earnings and pricing models.

Table 6 The Mishkin test

	Pre-regulation (2000–2006)		Post-regulation (2007–2015)	
	Coefficient	t-stat	Coefficient	t-stat
γ_1	0.733	94.59	0.714	146.32
γ_2	0.117	15.13	0.125	25.82
γ_3	0.008	1.00	0.076	15.67
γ_1^*	0.877	11.07	0.884	19.66
γ_2^*	0.228	2.92	0.306	6.81
γ_3^*	0.113	1.44	0.004	1.84
$\gamma_1 = \gamma_1^*$	Likelihood ratio statistic = 3.42 Marginal significance level = 0.065			
$\gamma_2 = \gamma_2^*$	Likelihood ratio statistic = 2.07 Marginal significance level = 0.150			
$\gamma_3 = \gamma_3^*$	Likelihood ratio statistic = 1.82 Marginal significance level = 0.177			

The table reports the results of the Mishkin test. Model 4 is the earnings model, whereas Model 5 is the pricing model. TP_t is pre-tax total profit reported as of the fiscal year-end scaled by average total assets. $CORE_t$ is computed as operating income excluding investment income scaled by average total assets (prior to 2007) and as operating income excluding investment income and unrealized gains and losses from trading securities scaled by average total assets (from 2007 on). $INVEST_t$ is investment income as of the fiscal year-end scaled by average total assets. $OTHER_t$ is other earnings and computed as $TP_t - CORE_t - INVEST_t$ prior to 2007 and as $TP_t - CORE_t - INVEST_t - Unrealized\ trading\ gain/loss$ post 2007. RET_{t+1} is future one-year-ahead return starting from the fifth month after a firm's fiscal year-end. Each year, all variables except return variables are percentile ranking variables. The sample consists of 8,202 and 18,037 firm-year observations with nonmissing investment income ($INVEST$) and core earnings ($CORE$) for the pre-regulation (2000–2006) and post-regulation (2007–2015) periods, respectively. Please see the appendix 1 for detailed variable definitions

$$RET_{t+1} = \gamma_0 + \gamma_1 CORE_t + \gamma_2 INVEST_t + \gamma_3 OTHER_t + \varepsilon_{t+1} \quad (4)$$

$$Pricing\ model: RET_{t+1} = \beta (TP_{t+1} r^{\gamma_0} - \gamma_1 * CORE - \gamma_2 * INVEST - r^{\gamma_3} * OTHER) + \theta_{t+1} \quad (5)$$

Table 7 Decomposition of investment income

Dependent variable	Intercept	$CORE_t$	Adj. R ²
Panel A: Regressions of investment income components on core earnings (2007–2015)			
$INVEST_JV$	0.002 (11.48)	-0.003 (-2.67)	0.001
$INVEST_OTHER$	0.008 (12.23)	-0.045 (-11.87)	0.041
Panel B: Regressions of future annual stock returns (2007–2015)			
Variables	Coefficient (t-stat)		
Intercept	0.234 (1.57)		
$CORE_t$	-0.129 (-0.56)		
$INVEST_JV_t$	-0.397 (-1.14)		
$INVEST_OTHER_t$	-0.695 (-2.03)		
$OTHER_t$	-0.177 (-0.63)		
$SIZE_t$	-0.005 (-2.57)		
BM_t	0.045 (0.60)		
$PMOM_t$	-0.035 (-1.00)		
Adj. R ²	0.056		

The table reports average coefficients and Fama-MacBeth t-statistics with Newey-West adjustments (lag = 3) from yearly regressions of $INVEST_JV$ and $INVEST_OTHER$ on core earnings ($CORE$) and from yearly regressions of future stocks returns on $INVEST_JV$ and $INVEST_OTHER$. We decompose investment income ($INVEST$) into two components: investment income related to associated and joint ventures ($INVEST_JV$) and other investment income ($INVEST_OTHER$). $CORE_t$ is computed as operating income excluding investment income and unrealized gains and losses from trading securities scaled by average total assets. $INVEST_t$ is investment income as of the fiscal year-end scaled by average total assets. $OTHER_t$ is other earnings and computed as $TP_t - CORE_t - INVEST_t$ prior to 2007 and as $TP_t - CORE_t - INVEST_t - Unrealized\ trading\ gain/loss$ post 2007. TP_t is pre-tax total profit reported as of the fiscal year-end scaled by average total assets. $SIZE_t$ is the market value of equity as of the fiscal year-end. BM_t is the book value of equity as of the fiscal year-end scaled by the market value of equity as of the fiscal year-end. $PMOM_t$ is price momentum, measured as the cumulative six-month returns with a one-month lag, relative to the future return window. For each year, all variables except for return variables are winsorized at 1 and 99%. The sample includes 17,581 firm-year observations with nonmissing investment income ($INVEST$) and core earnings ($CORE$) from 2007 to 2015, as the component information is only available since 2007. Please see Appendix 1 for detailed variable definitions

Table 6 reports the results of the Mishkin test. The earnings model shows that $CORE$ is highly persistent, with coefficient estimates of 0.733 and 0.714 in the pre- and post-regulation periods. Both $INVEST$ and $OTHER$ are less persistent than $CORE$, with coefficient estimates below 0.15 in both periods. The market understands the difference in persistence between $CORE$, $INVEST$, and $OTHER$, as reflected in higher coefficients on $CORE$ than on $INVEST$ and $OTHER$ in the pricing model. More importantly, the Mishkin test shows that the market is largely efficient in the pre-regulation period. The differences in coefficient estimates on $CORE$, $INVEST$, and $OTHER$ between the earnings and the pricing models are all statistically insignificant at 5%, a result consistent with the evidence of market efficiency in Table 4. However, in the post-regulation period, the market seems to

place higher weights on both *CORE* and *INVEST* ($\gamma_1^* = 0.884$ and $\gamma_2^* = 0.306$ vs. $\gamma_1 = 0.714$ and $\gamma_2 = 0.125$) and stay efficient on *OTHER* ($\gamma_3^* = 0.004$ vs. $\gamma_3 = 0.076$). The finding that the market over-weights *INVEST* in the Mishkin test is also consistent with the result in Table 4, whereas the result on *CORE* is somewhat inconsistent with the evidence in Table 4.¹⁴

Overall, our results indicate that, following the regulation change, firms have strong incentives to report high investment income when core earnings are low and vice versa. Core earnings and investment income exhibit a significantly negative correlation every year in the post-regulation period, in contrast to a significantly positive correlation in the pre-regulation period. Stock prices do not fully incorporate these changes in the information content of investment income and overreact to investment income in the post-regulation period. The results imply that the regulatory change of moving investment income above the line of operating income has real economic impact on business activities and stock market valuation.

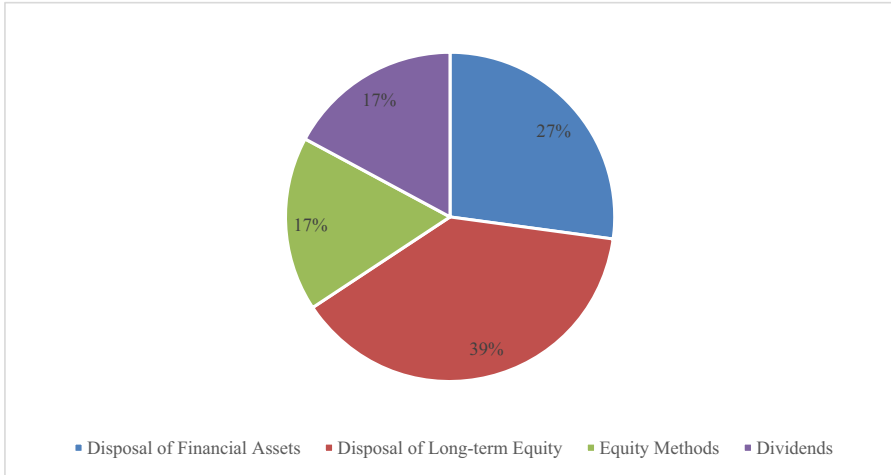
4.3 Decomposition of investment income

In the income statement of Chinese firms, profits/losses related to associates and joint ventures are listed separately under the category of investment income. The rest of investment income is not explicitly listed in the income statement but can be derived as investment income minus profits/losses related to associates and joint ventures. Profits/losses related to associates and joint ventures primarily measure the portion of earnings in invested companies that belong to the firm and thus are less at management's discretion. On the other hand, management has more discretion in timing the sale of financial securities or selecting which category of long-term equity investments to dispose of, the income from which is included in investment income other than profits/losses related to associates and joint ventures. Therefore, to examine which component drives the negative relationship between investment income and core earnings and the market overreaction in the post-regulation period, we decompose investment income into investment income related to associates and joint ventures (*INVEST_JV*) and other investment income (*INVEST_OTHER*).

Panel A of Table 7 reports the results from regressing *INVEST_JV* and *INVEST_OTHER* on core earnings for 2007–2015. When *INVEST_JV* is the dependent variable, the estimated coefficient on *CORE* is very small, -0.003 ($t = -2.67$), whereas the coefficient for the regression of *INVEST_OTHER* is -0.045 ($t = -11.87$), a magnitude almost 15 times the coefficient for *INVEST_JV*. These results indicate that the significant negative correlation between investment income and core earnings comes mainly from other investment income, supporting earnings management through the

¹⁴ The regressions in Table 4 are Fama-MacBeth regressions, whereas the Mishkin test in Table 6 is a pooled regression. While most results between these two tables are consistent with each other (all variables in the pre-regulation period and *INVEST* and *OTHER* in the post-regulation period), the results on *CORE* in the post-regulation period are not consistent between these two tables. Table 6 shows that the market significantly over-weights *CORE* in the post-regulation period, whereas Table 4 shows that the market over-weights *CORE* but the overweighing is statistically insignificant.

(a) Details of Investment Income in Firms with Increases in Investment Income



(b) Details of Investment Income in Firms with Decreases in Investment Income

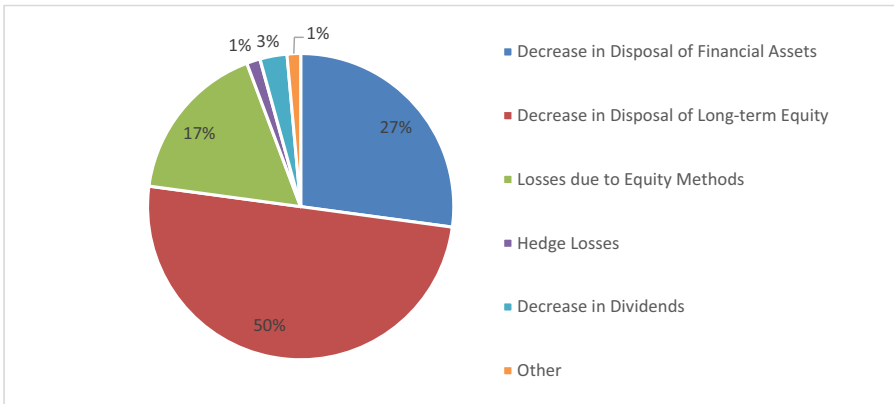


Fig. 3 Details of investment income from 2007 to 2015. Panel A: Details of Investment Income in Firms with Increases in Investment Income. Panel B: Details of Investment Income in Firms with Decreases in Investment Income. Figure 3 summarizes reasons behind increases or decreases in investment income. Each year, we sort the sample firms into five portfolios based on ΔCORE ($\text{CORE}_t - \text{CORE}_{t-1}$). Then, for each year from 2007 to 2015, we randomly select 10 firms with positive (negative) ΔINVEST in the lowest (highest) ΔCORE quintile. We go through their annual reports to get the details of investment income and the firms' explanations for their investment income

opportunistic sale or disposal of financial securities or long-term equity investment to influence the reported amount of investment income and thus operating income.

Panel B of Table 6 repeats the Fama-MacBeth cross-sectional regressions of future one-year returns on earnings components and control variables for 2007–2015, decomposing INVEST into INVEST_{JV} and INVEST_{OTHER} . The average of the estimated coefficients on INVEST_{JV} is -0.397 ($t = -1.14$), while the coefficient on INVEST_{OTHER} is -0.695 ($t = -2.03$). The significant and negative coefficient on

INVEST_OTHER implies that the stock market's overreaction to investment income is attributable to other investment income that captures profits/losses from management's opportunistic sale of investments. Investment income related to associates and joint ventures is subject to less discretion and does not cause significant stock market mispricing.

In sum, the results suggest that investment income's negative correlation with core earnings and market overreaction to investment income are mainly driven by other investment income that includes profits/losses from the sale or disposal of financial securities or long-term equity investments, lending further support to management's opportunistic timing and picking of the investments for sale.

4.4 Anecdotal evidence

To get a better sense of how firms manage operating income via investment income in the post-regulation period, we take a further look at details of investment income. We first sort the sample into five portfolios based on $\Delta CORE$ ($CORE_t - CORE_{t-1}$) for every year. Then for each year from 2007 to 2015, we randomly select 10 firms with positive $\Delta INVEST$ (no repeated draw) in the lowest $\Delta CORE$ quintile. In this way, we have 90 annual observations. We manually examine the footnotes of investment income and firms' explanations for changes in investment income in their annual reports. From these 90 firms, we find four sources for the increase in investment income: gains from the disposal of financial assets, gains from the disposal of long-term equity, investment income through equity methods, and dividends. Panel A of Fig. 3 shows that gains from the disposal of long-term equity are the prime reason for the increase in investment income when core earnings are low.

Similarly, to illuminate the reason for the decrease in investment income, we randomly select 10 firms for each year with negative $\Delta INVEST$ in the highest $\Delta CORE$ quintile. We find six reasons for the decrease in investment income: decrease in gains from the disposal of financial assets, decrease in gains from the disposal of long-term equity, investment losses through equity methods, hedge losses, decrease in dividends, and other. Panel B of Fig. 3 suggests that firms forego gains from the disposal of long-term equity when core earnings perform well.

Overall, the results in Fig. 3 indicate that the primary source of investment income is from the disposal of long-term equity investment, evidence consistent with the idea that firms time the sale of long-term equity investment to help manage operating income.

5 Additional analysis and sensitivity checks

In this section, we conduct additional tests on non-operating income/expenses, on the timing of the sale of financial securities and long-term equity investments, and on cross-sectional variations in the relationship between investment income and core earnings. We also perform tests on earnings thresholds to assess the validity of the results reported in Section 4.

Table 8 The relationship between non-operating income/expense and core earnings

Year	Model 6	Model 7	Model 8	Year	Model 6	Model 7	Model 8
Pre-regulation period (2000–2006)							
2000	-0.003 (-0.57)	-0.063 (-12.93)	0.063 (10.01)	2007	-0.364 (-18.81)	-0.037 (-13.73)	-0.327 (-17.18)
2001	-0.006 (-1.87)	-0.138 (-20.20)	0.131 (17.78)	2008	-0.161 (-13.62)	-0.042 (-13.89)	-0.118 (-10.34)
2002	-0.008 (-2.73)	-0.132 (-18.96)	0.117 (15.48)	2009	-0.147 (-18.14)	-0.031 (-14.35)	-0.116 (-14.64)
2003	-0.020 (-5.61)	-0.110 (-15.76)	0.086 (10.31)	2010	-0.171 (-16.59)	-0.022 (-9.31)	-0.150 (-15.16)
2004	-0.018 (-6.25)	-0.163 (-21.56)	0.126 (10.86)	2011	-0.082 (-11.14)	-0.012 (-8.43)	-0.070 (-9.96)
2005	-0.010 (-3.64)	-0.138 (-20.16)	0.126 (16.36)	2012	-0.068 (-12.19)	-0.007 (-6.21)	-0.060 (-11.28)
2006	-0.041 (-8.76)	-0.145 (-15.09)	0.105 (9.76)	2013	-0.047 (-10.77)	-0.013 (-9.37)	-0.034 (-7.77)
				2014	-0.028 (-6.96)	-0.017 (-12.74)	-0.109 (-2.78)
Fama-MacBeth	-0.015 (-3.09)	-0.127 (-10.47)	0.108 (11.38)	2015	-0.030 (-7.94)	-0.009 (-9.37)	-0.021 (-5.71)
				Fama-MacBeth	-0.122 (-3.45)	-0.021 (-5.02)	-0.101 (-3.11)

The table reports the coefficient estimates on CORE and associated Fama-MacBeth t-statistics with Newey-West adjustments (lag = 3) from yearly regressions of models (6), (7), and (8). Non-operating income is non-operating income (B001400000) scaled by average total assets. Non-operating expense is non-operating expenses (B001500000) scaled by average total assets, in a positive amount. $CORE_t$ is core earnings computed as operating income excluding investment income scaled by average total assets (prior to 2007) and as operating income excluding investment income and unrealized gains and losses from trading securities scaled by average total assets (from 2007 and on). For each year, all variables are winsorized at 1 and 99%. The sample period is 2000–2015, with 2000–2006 as the pre-regulation period and 2007–2015 as the post-regulation period. Please see Appendix 1 for detailed variable definitions

$$\text{Non-operating Income}_t = \beta_0 + \beta_1 \text{CORE}_t + \varepsilon_t \quad (6)$$

$$\text{Non-operating Expense}_t = \beta_0 + \beta_1 \text{CORE}_t + \varepsilon_t \quad (7)$$

$$(\text{Non-operating Income} - \text{Non-operating Expense})_t = \beta_0 + \beta_1 \text{CORE}_t + \varepsilon_t \quad (8)$$

5.1 The use of non-operating income/expense to manage earnings

Investment income is certainly not the only vehicle for managing earnings when contracts or regulations are based on net income. Another convenient choice is to manage non-operating income/expenses, earnings items listed below the line of operating income. In this section, we consider non-operating income and expenses, the net of which is the *OTHER* component when we decompose total profits into core earnings, investment income, and *OTHER* in earlier sections. The key difference between investment income and non-operating income in our setting is that the position of investment income in the income statement changes after 2006, whereas non-operating income/expenses continue to be listed below the line of operating income. Non-operating income (*NONOPINC*) refers to income that has no direct connection with a company's business operations, such as disposal gains of noncurrent assets, net earnings from exchange of nonmonetary assets, gains from debt restructuring, government subsidy, surplus of assets, and donation income.¹⁵ Non-operating expenses (*NONOPEXP*) refer to expenses that have no direct connection with a firm's business operations, such as net loss from disposal of noncurrent assets, loss from exchange of nonmonetary assets, loss from debt restructuring, donations, extraordinary losses, loss on assets, and so on. We separately estimate the following three models for the pre- and post-regulation period.

$$NONOPINC_t = \beta_0 + \beta_1 CORE_t + \varepsilon_t \quad (6)$$

$$NONOPEXP_t = \beta_0 + \beta_1 CORE_t + \varepsilon_t \quad (7)$$

$$NONOPINC_t - NONOPEXP_t = \beta_0 + \beta_1 CORE_t + \varepsilon_t \quad (8)$$

Table 8 presents the year-by-year regression results from estimating models (6), (7), and (8). For brevity, we report only the coefficients on *CORE*. Non-operating income is negatively correlated with core earnings in the pre-regulation period, with an average coefficient of -0.015 . In the post-regulation period, the coefficient on *CORE* of -0.122 is about eight times larger in magnitude. These results suggest that firms use non-operating income to smooth earnings, even in the pre-regulation period, but that earnings management is much stronger in the post-regulation period. Non-operating expense is strongly negatively correlated with core earnings in the pre-regulation period, with an average coefficient estimate of -0.127 . The average coefficient drops by more than 80% to -0.021 in the post-regulation period. A negative correlation between

¹⁵ Studies have examined some specific items, such as earnings from debt restructuring (He et al. 2012). We examine the summary measure of non-operating activities as a broader coverage of earnings management activities and supplement the findings about the regime shift in 2006.

Table 9 Timing of earnings management using quarterly data

Year	Model 9	Model 10	Model 11	Year	Model 9	Model 10	Model 11
	Pre-regulation period (2002–2006)						
2002	-0.010 (-2.80)	0.024 (7.04)	0.020 (2.90)	2007	-0.016 (-3.27)	-0.022 (-6.70)	-0.029 (-5.45)
2003	-0.005 (-1.33)	0.014 (4.18)	0.001 (0.28)	2008	-0.009 (-2.82)	-0.013 (-5.57)	-0.017 (-4.43)
2004	-0.008 (-2.57)	0.042 (11.24)	0.043 (5.37)	2009	-0.008 (-2.33)	-0.022 (-7.39)	-0.031 (-5.98)
2005	0.003 (1.00)	0.045 (8.75)	0.063 (6.52)	2010	-0.020 (-5.87)	-0.030 (-10.34)	-0.039 (-8.77)
2006	-0.006 (-1.35)	0.012 (2.47)	0.004 (0.48)	2011	-0.027 (-7.22)	-0.019 (-9.28)	-0.027 (-8.91)
				2012	-0.021 (-7.99)	-0.019 (-8.53)	-0.026 (-7.80)
				2013	-0.018 (-5.22)	-0.021 (-9.10)	-0.031 (-8.77)
				2014	-0.024 (-7.58)	-0.025 (-8.98)	-0.034 (-7.90)
				2015	-0.019 (-5.56)	-0.022 (-9.07)	-0.030 (-7.96)
Fama-MacBeth	-0.005 (-3.18)	0.027 (7.50)	0.026 (4.00)	Fama-MacBeth	-0.018 (-7.26)	-0.021 (-25.73)	-0.029 (-22.42)

The table reports the coefficient estimates and associated Fama-MacBeth *t*-statistics with Newey-West adjustments (lag = 3) from yearly regressions of models (9), (10), and (11). In models 9 and 10, we decompose investment income into two components: investment income in the first three quarters (*INVEST_Q123*) and investment income in the fourth quarter (*INVEST_Q4*). We regress these two components on core earnings (*CORE_t*). In model 11, we regress *INVEST_Q4* on core earnings in the first three quarters (*CORE_Q123*), *CORE_t*, is computed as operating income excluding investment income scaled by average total assets (prior to 2007) and as operating income excluding investment income and unrealized gains and losses from trading securities scaled by average total assets (from 2007 and on). *INVEST_t* is investment income as of the fiscal year-end scaled by average total assets. For each year, all variables are winsorized at 1 and 99%. The sample period is 2002–2015, with 2002–2006 as the pre-regulation period and 2007–2015 as the post-regulation period, as the quarterly data are only available since 2002. Please see Appendix 1 for detailed variable definitions

$$INVEST_Q123_t = \beta_0 + \beta_1 CORE_t + \varepsilon_t \quad (9)$$

$$INVEST_Q4_t = \beta_0 + \beta_1 CORE_t + \varepsilon_t \quad (10)$$

$$INVEST_Q4_t = \beta_0 + \beta_1 CORE_Q123_t + \varepsilon_t \quad (11)$$

non-operating expense (in positive terms) and core earnings suggests that firms report high non-operating expenses when they do poorly in their core business, a result consistent with the economic idea of co-movement between core and non-operating business. The resulting net effect, as shown from estimating model (8), presents a positive correlation with core earnings in the pre-regulation period and a negative correlation in the post-regulation period. This regime shift is explained by the dominance of non-operating expense in the pre-regulation period and the dominance of non-operating income in the post-regulation period.

From the information perspective, we find no investor mispricing of non-operating income and expenses. Similar to the findings of insignificant coefficients on *OTHER* in Table 4, we find insignificant coefficients on non-operating income and non-operating expenses (untabulated) in both the pre- and post-regulation periods. Overall, the results suggest no mispricing of non-operating income and expenses, as the new regulation does not change the position of these items in the income statement.

5.2 Timing of investment income

If firms cherry-pick the category of financial securities or long-term equity investments for sale and time the sale, they are more likely to do so in the fourth quarter, after observing the performance of core earnings in the first three quarters. The fourth quarter is also the last chance to manage annual numbers, on which many contracts are based. We conduct two related tests to assess the timing of investment income using quarterly data. We first separate investment income into that from the first three quarters (*INVEST_Q123*) and that from the fourth quarter (*INVEST_Q4*). We regress both components on core earnings to examine whether the investment income earned during the fourth quarter (*INVEST_Q4*) drives the negative correlation between investment income and core earnings found in Section 4. We estimate the following two models for the pre- and post-regulation periods.

$$INVEST_Q123_t = \beta_0 + \beta_1 CORE_t + \varepsilon_t. \quad (9)$$

$$INVEST_Q4_t = \beta_0 + \beta_1 CORE_t + \varepsilon_t. \quad (10)$$

Next, we separate core earnings into earnings from the first three quarters (*CORE_Q123*) and earnings from the fourth quarter (*CORE_Q4*) and directly test whether firms manage investment income in the fourth quarter in response to the level of core earnings over the first three quarters.¹⁶ This lead-lag relationship between core earnings in the first three quarters and investment income in the fourth quarter helps address the causality issue. We expect a

¹⁶ We do not rule out the possibility that firms manage investment income in the quarter after observing the same-quarter core earnings. We believe the lead-lag relationship introduced here helps to address the causality issue that firms manage investment income in response to the level of core earnings.

Table 10 Cross-sectional variations in the relationship between CORE and INVEST

Regression	Predicted sign	1	2 (X = BIG4)	3 (X = COV)	4 (X = BOARDSIZE)	5 (X = 1 if CORE _t > 0)	6 (X = 1 if CORE _t > CORE _{t-1})
Intercept		0.003 (8.34)	-0.003 (-6.22)	-0.003 (-3.01)	-0.006 (-4.59)	0.002 (1.98)	-0.003 (-6.69)
D	+	0.007 (17.78)	0.012 (23.69)	0.012 (12.45)	0.016 (7.70)	0.013 (11.23)	0.012 (23.02)
CORE _t	+	0.027 (6.25)	0.034 (7.10)	-0.006 (-0.48)	0.079 (4.18)	0.083 (9.55)	0.050 (9.00)
D*CORE _t	-	-0.072 (-13.02)	-0.069 (-10.04)	-0.049 (-3.25)	-0.107 (-3.98)	-0.069 (-5.26)	-0.072 (-9.38)
X _t			0.004 (1.87)	0.002 (2.57)	0.000 (2.67)	-0.003 (-2.97)	0.002 (2.41)
D*X _t			-0.001 (-0.40)	-0.003 (-2.59)	-0.000 (-1.66)	-0.005 (-4.53)	0.000 (0.48)
CORE _t *X _t			-0.040 (-2.36)	-0.011 (-0.86)	-0.005 (-2.76)	-0.096 (-9.32)	-0.058 (-5.57)
D*CORE _t *X _t	+		0.052 (2.18)	0.037 (2.42)	0.004 (1.53)	0.065 (4.29)	0.029 (2.35)
D*CORE _t *SIZE _{t-1}			-0.000 (-0.87)	-0.000 (-1.51)	-0.000 (-0.96)	-0.000 (-1.77)	-0.000 (-0.96)
D*CORE _t *BM _{t-1}			-0.006 (-0.57)	0.018 (1.49)	-0.002 (-0.18)	0.027 (2.55)	-0.007 (-0.63)
D*CORE _t *RET12 _{t-1}			-0.017 (-3.58)	-0.020 (-3.56)	-0.018 (-3.60)	-0.018 (-3.68)	-0.015 (-3.18)
D*CORE _t *INVEST _{t-1}			-0.096 (-0.92)	0.042 (0.38)	-0.099 (-0.93)	-0.133 (-1.42)	-0.156 (-1.59)
D*CORE _t *LOSS _{t-1}			0.010 (1.09)	0.015 (1.01)	0.008 (0.86)	-0.015 (-1.43)	-0.005 (-0.48)
OTHER CONTROLS		NO	YES	YES	YES	YES	YES
Adj. R ²		0.041	0.113	0.129	0.112	0.130	0.117

The table reports regression results based on external and internal monitoring as well as earnings thresholds. T-statistics in parentheses are associated with standard errors clustered both at the firm and year levels. *INVEST_t* is investment income as of the fiscal year-end scaled by average total assets. *CORE_t* is computed as operating income excluding investment income scaled by average total assets (prior to 2007) and as operating income excluding investment income and unrealized gains and losses from trading securities scaled by average total assets (from 2007 on). *D* is equal to 1 in the post-regulation period and 0 in the pre-regulation period. We use Big Four auditors (*BIG4*) and analyst coverage (*COV*) to proxy for external monitoring and use the size of board (*BOARDSIZE*) to proxy for internal monitoring. Earnings thresholds are either zero or prior year's earnings. For zero earnings threshold, *X_t* is equal to 1 if *CORE_t* > 0 and 0 otherwise. For prior year's earnings threshold, *X_t* is equal to 1 if *CORE_t* > *CORE_{t-1}* and 0 otherwise. Regulation changes in 2007 affect the reporting of investment income. *SIZE_{t-1}* is the market value of equity at the end of fiscal year *t-1*. *BM_{t-1}* is the book-to-market ratio, calculated as the book value of equity scaled by the market value of equity at the end of fiscal year *t-1*. *RET12* is cumulative stock returns over the 12-month period starting from January to December in a firm's fiscal year. *INVEST_{t-1}* is investment level at the end of fiscal year *t-1* scaled by average total assets. *LOSS_{t-1}* is a dummy variable indicating loss firms at the end of fiscal year *t-1*. Prior to 2007, investment income is excluded from operating income and listed below the line of the operating income. Starting from fiscal year 2007, investment income is part of operating income and listed above the line of operating income. Each year, financial variables are winsorized at 1 and 99%. The sample consists of 26,239 firm-year observations with nonmissing investment income (*INVEST*) or core earnings (*CORE*) over the sample period of 2000–2015. Please see Appendix 1 for detailed variable definitions

$$INVEST_t = \beta_0 + \beta_1 D_t + \beta_2 CORE_t + \beta_3 D * CORE_t + \beta_4 X * D * CORE_t + CONTROL_t + \varepsilon_t \quad (12, 13)$$

negative relationship between $INVEST_Q4$ and $CORE_Q123$ in the following Eq. (11).

$$INVEST_Q4_t = \beta_0 + \beta_1 CORE_Q123_t + \varepsilon_t. \quad (11)$$

We use 2002–2006 as the pre-regulation period and 2007–2015 as the post-regulation period because quarterly data in China start from 2002.

Table 9 presents the Fama-MacBeth regression results from estimating models (9), (10), and (11). The results from the first two models suggest that investment income in the fourth quarter constitutes the main buffer to smooth out the annual performance of operating income. Investment income in the fourth quarter ($INVEST_Q4$) is positively correlated with annual core earnings ($CORE$) in the pre-regulation period and strongly negatively correlated with annual core earnings in the post-regulation period, consistent with the main findings in Table 2. In contrast, investment income in the first three quarters ($INVEST_Q123$) exhibits either the sign opposite to $INVEST_Q4$ in the pre-regulation period or weaker results than $INVEST_Q4$ in the post-regulation period. Additionally, the results on Eq. (11) show that the average coefficient on core earnings earned during the first three quarters ($CORE_Q123$) is significantly positive in the pre-regulation period and turns significantly negative in the post-regulation period, again consistent with the main results in Table 2. In sum, the lead-lag relationship between investment and core earnings lends strong support to the conjecture that firms opportunistically manage investment income in the fourth quarter to influence the annual operating income performance in response to the level of core earnings generated over the first three quarters.

5.3 The role of external and internal monitoring

Results in the previous sections indicate that firms have incentives to use investment income to influence the amount of reported operating income in the post-regulation period. We conduct additional tests to examine whether a stronger monitoring mechanism can mitigate the earnings management incentives. We consider two external monitoring mechanisms (Big Four auditors and large analyst following) and one internal monitoring mechanism (board size). As summarized by Dechow, Ge, and Schrand (2010), studies generally show that firms with Big-X auditors, where X = 8, 6, 5, or 4 depending on the timing of the study, are less likely to manage earnings. In addition, firms covered by more analysts manage their earnings less (Yu 2008). Finally, Anderson et al. (2004) find that larger board size is associated with higher integrity of the financial report and lower costs of debt, measured as the yield spread.

If stronger external or internal monitoring mitigates the earnings management incentives, we expect the negative correlation between investment income and core earnings to be weaker for firms with stronger monitoring mechanisms. We estimate the following model (12) using the entire sample with standard errors clustered at both the firm and year level.

$$INVEST_t = \beta_0 + \beta_1 D + \beta_2 CORE_t + \beta_3 D^* CORE_t + \beta_4 X^* D^* CORE_t + CONTROL_t + \varepsilon_t. \quad (12)$$

D is a dummy variable with the value of 1 in the post-regulation period and 0 otherwise. X represents the three monitoring mechanisms: dummy variable for Big Four auditors ($BIG4$), analyst following (COV), or board size ($BOARDSIZE$). The coefficient on the interaction term of D and $CORE$ measures the difference in earnings management incentives between the pre- and post-regulation periods, and previous findings suggest $\beta_3 < 0$. The coefficient on the interaction term of D , $CORE$, and monitoring variable X measures the influence of each monitoring mechanism on the negative correlation between investment income and core earnings post-regulation. If stronger monitoring mitigates the earnings management incentives, we expect $\beta_4 > 0$. As the three-way interaction term with X is our main variable of interest, we include a number of three-way interactions with control variables ($D * CORE$ interacted with control variables) in the regression model, which also helps mitigate the concern that variation in client characteristics explains our results (Lawrence, Minutti-Meza, and Zhang 2011).

Table 10 reports results on how monitoring mechanisms change firms' incentives to report high investment income when core earnings are low. We first run the regression model (12) without any monitoring variables. Column 1 shows a positive coefficient on $CORE$ (coeff = 0.027, $t = 6.25$) and a negative coefficient on the interaction term $D * CORE$ (coeff = -0.072, $t = -13.02$). The total coefficient on $CORE$ in the post-regulation period is -0.045 (the sum of 0.027 and -0.072), consistent with the findings in previous sections that investment income and core earnings are positively correlated in the pre-regulation period and negatively correlated in the post-regulation period. In columns 2 through 4, we introduce the monitoring variables one by one and find that, while the coefficients on $D * CORE$ remain highly negative, the coefficients on the interaction terms of $D * CORE * BIG4$, $D * CORE * COV$, and $D * CORE * BOARDSIZE$ are all positive. The respective coefficients are 0.052 ($t = 2.18$), 0.037 ($t = 2.42$), and 0.004 ($t = 1.53$). The positive coefficients on the three-way interaction terms weaken the negative correlation between investment income and core earnings, implying that stronger monitoring mechanisms help restrain management from reporting high investment income when core earnings are low or vice versa in the post-regulation period.

5.4 The role of earnings thresholds

In this section, we consider the role of earnings thresholds when firms use investment income to manage earnings. Conceptually, firms are less likely to use investment income to boost operating income if their core operations are doing well. Therefore we expect the correlation between investment income and core earnings to be less negative in the post-regulation period when a firm's core earnings exceed certain thresholds. We consider two earnings thresholds: zero and prior year earnings. We run the following regression and expect the coefficients on $X * D * CORE$ to be positive.

$$INVEST_t = \beta_0 + \beta_1 D_t + \beta_2 CORE_t + \beta_3 D * CORE_t + \beta_4 X * D * CORE_t + CONTROL_t + \varepsilon_t, \quad (13)$$

where $X = 1$ if $CORE_t > 0$ and 0 otherwise (zero threshold) or where $X = 1$ if $CORE_t > CORE_{t-1}$ and 0 otherwise (prior-year earnings threshold). D is an

indicator variable with the value of 1 in the post-regulation period and 0 in the pre-regulation period.

Columns 5 and 6 in Table 10 show that the coefficients on X^*D^*CORE are significantly positive, consistent with our conjecture that firms are less likely to use investment income to manage earnings when their core operations are doing well.

6 Conclusions

We explore a unique regulatory setting that, starting from 2007, requires that the line item of investment income appear above the line of operating income, in contrast to appearing below the line of operating income prior to 2007. We use this setting to investigate whether firms change corporate activities to manage investment income opportunistically in response to this regulation change, and we explore how investors value the information content of this line item when it is presented in a different place in the income statement.

From the firm perspective, we find that investment income and core earnings exhibit a significantly negative correlation every year in the post-regulation period, in contrast to a significantly positive correlation in the pre-regulation period. Firms tend to report high (low) investment income when core earnings are low (high) to influence the amount of reported operating income in the post-regulation period, mostly through opportunistically selling securities or long-term equity investments. This opportunism is concentrated in the fourth quarter, in response to the earnings performance in the first three quarters. Besides investment income, firms also use non-operating income to manage earnings, especially in the post-regulation period.

From the investor perspective, we find that the stock market appropriately prices investment income in the pre-regulation period but does not fully incorporate the manipulated information content of investment income in the post-regulation period. The stock market overreacts to the investment income in the contemporaneous year, particularly the part of investment income that includes profits/losses from the sale of financial securities or long-term equity investments. The positions of non-operating income and expenses are unchanged in the income statement following the new regulation, and we do not observe any mispricing associated with non-operating items.

Our results have important implications for policymakers. When accounting regulations change, firms are likely to alter their behavior in response and thus adjust the information content of accounting items. If operating income is an important metric for performance evaluation, re-classifying line items into operating income may induce opportunistic management of such line items and potentially mislead investors.

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Appendix 1

Variable definitions [CSMAR mnemonics]

Variables	Definition
<i>TP</i>	Pre-tax total profit (B001000000) scaled by average total assets (A001000000).
<i>INVEST</i>	Investment income (B001302000) scaled by average total assets (A001000000). <i>INVEST</i> is reported below the line of operating income prior to 2007 and above the line of operating income since 2007. To maintain consistency before and after 2007, we subtract impairment in short-term investments from investment income in the pre-2007 period. ⁸ In the post-2007 period, impairment in short-term investments is reflected in unrealized gains and losses, which is separated from investment income.
<i>INVEST_JV</i>	Investment income related to associates and joint ventures (B001302101) scaled by average total assets (A001000000).
<i>INVEST_OTHER</i>	Other investment income scaled by average total assets, measured as <i>INVEST</i> – <i>INVEST_JV</i> .
<i>CORE</i>	Core earnings, measured as operating income (B001300000) excluding investment income (B001302000) scaled by average total assets (A001000000) prior to 2007, and operating income excluding investment income (B001302000) and unrealized gains and losses from trading securities (B001301000) scaled by average total assets from 2007 and on. Both investment income and unrealized gains and losses from trading securities are added to operating income post-regulation change. Firms report operating income excluding investment income prior to 2007 and including investment income after 2007. However, to maintain the consistency, CSMAR adjusts operating income retroactively as if operating income includes investment income throughout the database.
<i>OTHER</i>	Other earnings scaled by average total assets, measured as <i>TP</i> – <i>CORE</i> – <i>INVEST</i> .
<i>NONOPINC</i>	Non-operating income (B001400000) scaled by average total assets (A001000000).
<i>NONOPEXP</i>	Non-operating expenses (B001500000) scaled by average total assets (A001000000), denoted in positive amount.
<i>INVEST_Q123</i>	Investment income earned in the first three quarters.
<i>INVEST_Q4</i>	Investment income earned in the fourth quarter.
<i>CORE_Q123</i>	Core earnings generated in the first three quarters.
<i>RET_t</i>	Contemporaneous annual stock returns, calculated as cumulative 12-month returns starting from the fifth month in a firm's fiscal year to the fourth month after fiscal year-end.
<i>RET_{t+1}</i>	One-year future stock returns, calculated as cumulative 12-month returns starting from the fifth month after a firm's fiscal year-end. As all Chinese firms have December 31 as their fiscal year-end, <i>RET_{t+1}</i> is measured from May, year <i>t</i> + 1 to April, year <i>t</i> + 2.
<i>SIZE</i>	The market value of equity (MSMVTTL) at the fiscal year-end, in billion Chinese yuan.
<i>BM</i>	The book-to-market ratio, measured as the book value of equity (A003000000) divided by the market value of equity (MSMVTTL*1000) as of the fiscal year-end.
<i>PMOM</i>	Price momentum, measured as the cumulative six-month returns with a one-month lag, relative to the future return window (from September, year <i>t</i> to March, year <i>t</i> + 1).
<i>RET12</i>	Cumulative stock returns over the 12-month period starting from January to December in a firm's fiscal year.
<i>INVE</i>	Investment level at the fiscal year-end scaled by average total assets. Investment level is measured as the sum of short-term investment (A001109000) and long-term investment (A001207000) prior to 2007 and as the sum of trading securities (A001107000), securities available for sale (A001202000), holding-to-maturity investment (A001203000), and long-term equity investment (A001207000) after 2007. Short-term investment and long-term investment no longer exist and are decomposed into the four items mentioned above since 2007.
<i>LOSS</i>	Dummy variable with the value of 1 for the loss firms and 0 otherwise.
<i>D</i>	Dummy variable with the value of 1 in the post-regulation period (2007–2015) and 0 otherwise.
<i>BIG4</i>	Dummy variable with the value of 1 for Big Four auditors and 0 otherwise.

(continued)

Variables	Definition
<i>COV</i>	Analyst coverage, measured as the number of analysts following the firm.
<i>BOARDSIZE</i>	The number of directors on a firm's board.

^a The impairment in the value of long-term investment is somewhat complicated. In the pre-2007 period, the impairment in long-term investment is included in investment income, but the impairment in long-term investment is mixed up with losses from associates and joint ventures under the equity method. In the post-2007 period, losses from associates and joint ventures are still included in investment income, but the impairment of long-term equity is included in other comprehensive income. Therefore we cannot separate the impairment in long-term investment from losses from associates and joint ventures in the pre-2007 period. For this reason, we do not subtract the impairment in long-term investment from investment income in the pre-2007 period, but the results are robust if we do so (whether we do so does not affect the post-2007 results, which are our focus)

Appendix 2 The Location of Investment Income in the Income Statement

This appendix shows the income statements of Wanke Real Estate Corporation (Stkcd: 000002) in 2006 and 2007. In 2006, investment income is excluded from operating income and is listed below the line of the operating income. In 2007, investment income is a part of operating income and is listed above the line of operating income. Investment income related to associates and joint ventures is reported separately under the category of investment income.

Income Statement in 2006		Income Statement in 2007	
Revenue	17848.21	Revenue	35526.61
Less: Cost of Goods Sold	11201.87	Less: Cost of Goods Sold	20607.34
Taxes and Associated Charges	1573.60	Taxes and Associated Charges	4115.77
Gross Profit	5072.75	Gross Profit	10803.50
Add: Other Operating Profit	(1.43)	Less: Selling Expenses	1194.53
Less: Selling Expenses	625.72	General and Administrative Expenses	1763.77
General and Administrative Expenses	851.96	Finance Expense	359.50
Finance Expense	140.15	Assets Impairment	18.57
Operating Income	3453.48	Add: Unrealized Gains and Losses	(22.25)
Add: Investment Income	(64.55)	Investment Income	208.03
Non-Operating Income	7.59	--- Investment Income from J&V	128.64
Total Profit before Tax	3396.52	Operating Income	7652.90
		Add: Non-Operating Income	(11.29)
		Total Profit before Tax	7641.61

References

- Abdel-Khalik, A. R., & McKeown, J. (1978). Understanding accounting changes in an efficient market: Evidence of differential reaction. *The Accounting Review*, 53(4), 851–868.
- Aharony, J., Lee, C. W., & Wong, T. J. (2000). Financial packaging of IPO firms in China. *Journal of Accounting Research*, 38(1), 103–126.
- Ahmed, A. S., Emre, K., & Lobo, G. J. (2006). Does recognition versus disclosure matter? Evidence from value-relevance of Banks' recognized and disclosed derivative financial instruments. *The Accounting Review*, 81(3), 567–588.
- Alfonso, E., Cheng, C. S., & Pan, S. S. (2015). Income classification shifting and mispricing of Core earnings. *Journal of Accounting, Auditing & Finance*, 1–32.
- Anderson, R., Mansi, S., & Reeb, D. (2004). Board characteristics, accounting report integrity, and the cost of debt. *Journal of Accounting and Economics*, 37(3), 315–342.
- Ball, R., & Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of Accounting Research*, 6(2), 159–178.
- Barth, M. E., Clinch, G., & Shibano, T. (2003). Market effects of recognition and disclosure. *Journal of Accounting Research*, 41(4), 581–609.
- Bartov, E. (1993). The timing of asset sales and earnings manipulation. *The Accounting Review*, 68(4), 840–855.
- Bartov, E., & Mohanram, P. S. (2014). Does income statement placement matter to investors? The case of gains/losses from early debt extinguishment. *The Accounting Review*, 89(6), 2021–2055.
- Barua, A., Steve, L., & Sbaraglia, A. M. (2010). Earnings management using discontinued operations. *The Accounting Review*, 85(5), 1485–1509.
- Bernard, V. L., & Thomas, J. K. (1990). Evidence that stock prices do not fully reflect the implications of current earnings for future earnings. *Journal of Accounting and Economics*, 13(4), 305–340.
- Bhattacharya, N., Black, E. L., Christensen, T. E., & Larson, C. R. (2003). Assessing the relative Informativeness and permanence of pro forma earnings and GAAP operating earnings. *Journal of Accounting and Economics*, 36(1–3), 285–319.
- Bradshaw, M. T., & Sloan, R. G. (2002). GAAP versus the street: An empirical assessment of two alternative definitions of earnings. *Journal of Accounting Research*, 40(1), 41–66.
- Bratten, B., Choudhary, P., & Schipper, K. (2013). Evidence that market participants assess recognized and disclosed items similarly when reliability is not an issue. *Accounting Review*, 88(4), 1179–1210.
- Burgstahler, D., Jambalvo, J., & Shevlin, T. (2002). Do stock prices fully reflect the implications of special items for future earnings? *Journal of Accounting Research*, 40(3), 585–612.
- Chambers, D., Linsmeier, T. J., Shakespeare, C., & Sougiannis, T. (2007). An evaluation of SFAS no. 130 comprehensive income disclosures. *Review of Accounting Studies*, 12(4), 557–593.
- Chen, C. W. K., & Yuan, H. Q. (2004). Earnings management and resource allocation: Evidence from China's accounting-based regulation of rights issues. *The Accounting Review*, 79(3), 645–665.
- Christensen, T. E., Drake, M. S., & Thornock, J. R. (2014). Optimistic reporting and pessimistic investing: Do pro forma earnings disclosures attract short sellers? *Contemporary Accounting Research*, 31(1), 67–102.
- Cready, W., Lopez, T. J., & Sisneros, C. A. (2010). The persistence and market valuation of recurring nonrecurring items. *The Accounting Review*, 85(5), 1577–1615.
- Das, S., Shroff, P. K., & Zhang, H. (2009). Quarterly earnings patterns and earnings management. *Contemporary Accounting Research*, 26(3), 797–831.
- Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, 50(2–3), 344–401.
- Dechow, P. M., Richardson, S. A., & Sloan, R. G. (2008). The persistence and pricing of the cash component of earnings. *Journal of Accounting Research*, 46(3), 537–566.
- Dechow, P. M., & Shakespeare, C. (2009). Do managers time securitization transactions to obtain accounting benefits? *The Accounting Review*, 84(1), 99–132.
- Dechow, P., & Skinner, D. (2000). Earnings management: Reconciling the views of accounting academics, practitioners, and regulators. *Accounting Horizons*, 14, 235–250.
- Dong, M., Ryan, S., & Zhang, X. (2014). Preserving amortized costs within a fair-value-accounting framework: Reclassification of gains and losses on available-for-sale securities upon realization. *Review of Accounting Studies*, 19(1), 242–280.
- Dong, M., & Zhang, X. (2018). Selective trading of available-for-sale securities: Evidence from U.S. commercial banks. *European Accounting Review*, 27(3), 467–493.

- Doyle, J., Lundholm, R., & Soliman, M. (2003). The predictive value of expenses excluded from pro forma earnings. *Review of Accounting Studies*, 8(2–3), 145–174.
- Espahbodi, H., Espahbodi, P., Rezaee, Z., & Tehranian, H. (2002). Stock price reaction and value relevance of recognition versus disclosure: The case of stock-based compensation. *Journal of Accounting and Economics*, 33(3), 343–373.
- Fields, T., Lys, T., & Vincent, L. (2001). Empirical research on accounting choice. *Journal of Accounting and Economics*, 31(1–3), 255–307.
- Graham, J. R., Harvey, C. R., & Rajgopal, S. (2005). The economic implications of corporate financial reporting. *Journal of Accounting and Economics*, 40(1–3), 3–73.
- Hand, J. R. M. (1990). A test of the extended functional fixation hypothesis. *The Accounting Review*, 65(4), 740–763.
- He, X., Wong, T. J., & Young, D. (2012). Challenges for implementation of fair value accounting in emerging markets: Evidence from China. *Contemporary Accounting Research*, 29(2), 538–562.
- Healy, P., & Wahlen, J. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*, 13, 365–383.
- Hirshleifer, D., & Teoh, S. H. (2003). Limited attention, information disclosure, and Financial Reporting. *Journal of Accounting and Economics*, 36(1–3), 337–386.
- Kun-Chih, C., Qiang, C., Ying, C. L., Yu-Chen, L., & Xing, X. (2016). Financial reporting quality of Chinese reverse merger firms: The reverse merger effect or the weak country effect? *The Accounting Review*, 91(5), 1363–1390.
- Lee, Y., Petroni, K., & Shen, M. (2006). Cherry picking, disclosure quality, and comprehensive income reporting choices: The case of property-liability insurers. *Contemporary Accounting Research*, 23(3), 655–692.
- Li, K., Wang, T., Cheung, Y., & Jiang, P. (2011). Privatization and risk sharing: Evidence from the split share structure reform in China. *The Review of Financial Studies*, 24(7), 2499–2525.
- Luo, M. (2008). Unusual operating cash flows and stock returns. *Journal of Accounting and Public Policy*, 27, 420–429.
- Maines, L. A., & McDaniel, L. S. (2000). Effects of comprehensive-income characteristics on nonprofessional Investors' judgments: The role of financial statement presentation format. *The Accounting Review*, 75(2), 179–207.
- McVay, S. E. (2006). Earnings management using classification shifting: An examination of Core earnings and special items. *Accounting Review*, 81(3), 501–531.
- Morse, D., & Richardson, G. (1983). The LIFO/FIFO decision. *Journal of Accounting Research*, 21(1), 106–127.
- Richardson, S. A., Sloan, R. G., Soliman, M. T., & Tuna, I. (2005). Accrual reliability, earnings persistence and stock prices. *Journal of Accounting and Economics*, 39(3), 437–485.
- Schipper, K. (1989). Commentary on earnings management. *Accounting Horizons*, 3(4), 91–102.
- Sloan, R. G. (1996). Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review*, 71(3), 289–315.
- Yu, F. (2008). Analyst coverage and earnings management. *Journal of Financial Economics*, 88(2), 245–271.
- Yu, K. (2013). Does recognition versus disclosure affect value relevance? Evidence from pension accounting. *Accounting Review*, 88(3), 1095–1127.
- Yun, F., Barua, A., Cready, W. M., & Thomas, W. B. (2010). Managing earnings using classification shifting: Evidence from quarterly special items. *The Accounting Review*, 85(4), 1303–1323.