The Earnings Persistence and the Market Pricing of Cash Flow Subcomponents of Thai Listed Firms

ความคงอยู่ในกำไรในอนาคตและการรับรู้ของตลาดทุนเกี่ยวกับความคงอยู่ในกำไรในอนาคตขององค์ประกอบย่อยของกระแสเงินสดสำหรับบริษัทจดทะเบียนในประเทศไทย

*Weerawit Keeratikulset**
*Somchai Supattarakul***

บทคัดย่อ

การศึกษานี้แบ่งแยกกำไรในปัจจุบันเป็น 2 องค์ประกอบ ได้แก่ รายการคงค้างและกระแสเงินสด และแบ่งแยกกระแสเงินสดเป็นอีก 3 องค์ประกอบย่อย ได้แก่ (1) การเปลี่ยนแปลงยอดคงเหลือของเงินสด (2) กระแสเงินสดสุทธิที่ให้แก่เจ้าหนี้ และ (3) กระแสเงินสดสุทธิที่ให้แก่ผู้ถือหุ้น การศึกษานี้แสดงหลักฐานเชิงประจักษ์เกี่ยวกับความคงอยู่ในกำไรในอนาคต (Earnings Persistence) และการรับรู้ของตลาดทุนเกี่ยวกับความคงอยู่ในของกำไรในอนาคต (Market Pricing) ขององค์ประกอบต่างๆ ของกำไรข้างต้นของบริษัทจดทะเบียนกับตลาดหลักทรัพย์แห่งประเทศไทยระหว่างปี พ.ศ. 2543 ถึงปี พ.ศ. 2552 ผลการศึกษาเกี่ยวกับความคงอยู่ในกำไรในอนาคตพบว่า กระแสเงินสดมีความคงอยู่ในกำไรในอนาคตมากกว่ารายการคงค้าง และกระแสเงินสดสุทธิที่ให้แก่ผู้ถือหุ้นมีความคงอยู่ในกำไรในอนาคตมากกว่าการเปลี่ยนแปลงในยอดคงเหลือของเงินสดและกระแสเงินสดสุทธิที่ให้แก่เจ้าหนี้ ผลการศึกษาเกี่ยวกับการรับรู้ของตลาดทุนเกี่ยวกับความคงอยู่ในของกำไรในอนาคตตามแนวทางการทดสอบของ Mishkin (1983) พบว่า ตลาดหลักทรัพย์ในประเทศไทยรับรู้ความคงอยู่ในกำไรในอนาคตสูงเกินไปสำหรับกำไรในปัจจุบัน รายการคงค้าง และกระแสเงินสดรวมทั้งองค์ประกอบย่อยทั้งสามของกระแสเงินสด นอกจากนี้ หลักฐานเชิงประจักษ์ที่พบยังชี้ให้เห็นว่าตลาดหลักทรัพย์ในประเทศไทยดูเหมือนว่าจะคาดการณ์ได้ว่าความคงอยู่ในกำไรในอนาคตสำหรับกระแสเงินสดสุทธิที่ให้แก่ผู้ถือหุ้นจะมีระดับที่สูงความคงอยู่ในกำไรในอนาคตสำหรับการเปลี่ยนแปลงยอดคงเหลือของเงินสดและกระแสเงินสดสุทธิที่ให้แก่เจ้าหนี้ แต่ดูเหมือนว่าตลาดหลักทรัพย์ในประเทศไทยจะไม่สามารถคาดการณ์ได้ว่าความคงอยู่ในกำไรในอนาคตสำหรับรายการคงค้างมีระดับต่ำกว่าความคงอยู่ในกำไรในอนาคตสำหรับการเปลี่ยนแปลงยอดคงเหลือของเงินสดและกระแสเงินสดสุทธิที่ให้แก่เจ้าหนี้

คำสำคัญ: ความคงอยู่ในกำไรในอนาคต การรับรู้ของตลาดทุนเกี่ยวกับความคงอยู่ในกำไรในอนาคต กระแสเงินสด รายการคงค้าง

*Audit Manager, Deloitte Touche Tohmatsu Jaiyos
**Assistant Professor, Thammasat Business School, Thammasat University

Abstract

This study decomposes current earnings into accruals and cash flows and further decomposes cash flows into three cash flow subcomponents: (1) the change in the cash balance, (2) net cash flows to debt holders, and (3) net cash flows to equity holders. The study provides empirical evidence on the earnings persistence and the market pricing of the persistence of these components of Thai listed firms during 2000-2009. Results on the earnings persistence reveal that cash flows are more persistent than accruals and more interestingly, of all three cash flow subcomponents, net cash flows to equity holders are the most persistence. The market pricing results from the Mishkin (1983) test suggest that Thai stock market overprices the persistence of current earnings, accruals, cash flows, and three cash flow subcomponents. In addition, our empirical evidence suggests that Thai stock market seems to anticipate the higher persistence of net cash flows to equity holders and the lower persistence of cash retained in the firm and net cash flows to debt holders, but it seems to fail to anticipate the lower persistence of accruals, relative to cash retained in the firm and net cash flows to debt holders.

Keywords: Earnings Persistence, Market Pricing, Cash Flows, Accruals

1. Introduction

A common use of accounting information is to assess a company's future cash flows generating capability. There is considerable accounting research examining whether cash basis or accrual basis is a superior predictor of future cash flows and future stock returns. Dechow, Kothari and Watts (1998) and Dechow and Dichev (2002) show that accrued accounting earnings are superior to cash accounting earnings in reflecting the firm performance.

Sloan (1996) decomposes earnings into two main components: accrual and cash flow components and examines the earnings persistence and the market pricing of the persistence of accrual and cash flow components.[1] He finds that accruals are less persistent than cash flows and that the stock markets in the United States overprice accruals while underprice cash flows. In other words, the stock markets seem to fail to fully reflect the lower (higher) persistence of accruals (cash flows) with respect to future earnings.

In addition to decomposing earnings into accrual and cash flows, Dechow, Richardson and Sloan (2008) further disaggregate cash flows into three subcomponents: (1) the change in the cash balance, (2) debt issuances and distributions, and (3) equity issuances and distributions. Their empirical evidence shows the higher persistence of equity issuances and distributions and the stock markets in the United States misprice the change in the cash balance and equity issuances and distributions but correctly price debt issuances and distributions.

Pincus, Rajgopal and Venkatachalam (2007) provide empirical evidence on the earnings persistence and the market pricing of the persistence of accruals and cash flows in 20 countries.[2] They find that cash flows seem to be more persistent than accruals in most countries. They also document that stock prices in developed markets (e.g., Australia, Canada, the United Kingdom and the United States) overprice the accruals persistence while those in emerging markets (e.g., India, Malaysia, Taiwan, and Thailand) do not seem to overprice the accruals persistence.

Empirical results on the earnings persistence and the market pricing of accruals and cash flows in Thailand are inconclusive. Vivattanachang and Supattarakul (2013) find the higher persistence of cash flows, relative to accruals while Pincus et al. (2007) find an insignificant difference between the persistence parameters of cash flows and accruals. Vivattanachang and Supattarakul (2013) also find that Thai stock market underprices both cash flow and accrual components while Pincus et al. (2007) document that Thai stock market underprices cash

[1] The earnings persistence is defined as a relation between next period earnings and current period earnings or their components (e.g., Sloan (1996), Francis, LaFond, Olsson and Schipper (2004) and Francis and Smith (2005)) and the market pricing is defined as investor perception about the persistence of earnings components reflected in stock prices.

[2] These countries are Australia, Canada, Denmark, France, Germany, Hong Kong, India, Indonesia, Italy, Japan, Malaysia, the Netherlands, Singapore, Spain, Sweden, Switzerland, Taiwan, Thailand, United Kingdom, and the United States.

flows but do not seem to misprice the accruals persistence.

Thai stock market is an emerging market with much smaller market capitalization and trading volume, relative to developed capital markets such as stock markets in the United States. Consequently, the market pricing of the accruals and cash flows persistence of Thai firms may be different from that of U.S. firms. Therefore, this study aims at investigating the earnings persistence and the market pricing of the persistence of accruals and cash flows and more importantly, those of three cash flow subcomponents, of Thai listed firms.

This study decomposes current earnings into accruals and cash flows and consistent with Dechow et al. (2008), further decomposes free cash flows into three cash flow subcomponents: (1) the change in the cash balance, (2) net cash flows to debt holders, and (3) net cash flows to equity holders. The OLS Regression is used to investigate the earnings persistence of these earnings components with respected to one-year-ahead earnings. The Nonlinear Generalized Least Squares Estimation or the Mishkin (1983) test is used to investigate the market pricing of these earnings components with respect to their implications of one-year-ahead earnings. Specifically, the forecasting and valuation models are jointly estimated and the forecasting parameter represents the persistence parameter of the earnings components while the valuation parameter represents the market pricing of their persistence.

Our final sample includes 379 firms (2,664 firm-year observations) listed in the Stock Exchange of Thailand (SET) during 2000-2009. Our empirical results show that Thai stock market overprices current earnings and their accrual and cash flow components as well as three cash flow subcomponents, consistent with Sloan (1996) and Dechow et al. (2008). We also find that cash flows are more persistent than accruals while accruals are perceived to be more persistent than cash flows. This suggests that Thai stock market seems to fail to anticipate the higher (lower) persistence of cash flows (accruals). More importantly, we find that all three cash flow subcomponents are more persistent than accruals and net cash flows to equity holders are more persistent than the remaining two cash flows subcomponents. In addition, we document that accruals are perceived to be less persistent than net cash flows to equity holders, but more persistent than the remaining two cash flow subcomponents. This suggests that Thai stock market seems to anticipate the higher persistence of net cash flows to equity holders and the lower persistence of cash retained in the firm and net cash flows to debt holders, but it seems to fail to anticipate the lower persistence of accruals, relative to cash retained in the firm and net cash flows to debt holders.

This study contributes to the accounting literature by providing empirical evidence on the earnings persistence of accruals and cash flows as well as three cash flow subcomponents and the market pricing of their persistence in Thailand. Moreover, results on the earnings persistence are

beneficial to capital market participants (e.g., financial analysts and investors) when they are predicting a firm's future earnings in an estimation of the firm's stock price while results of the market pricing are beneficial to them when they are making stock investment decisions in order to possibly earn abnormal returns. In addition, the mispricing of the persistence of the earnings components in this study contributes to the market efficiency literature.

The remainder of this study is organized as follows. Section 2 explains the literature on the earnings persistence and the market pricing of earnings and their components as well as the decomposition of cash flow subcomponents. Section 3 describes the sample selection criteria and variable measurements. Empirical tests are discussed in Section 4. Section 5 discusses empirical results. Finally, section 6 concludes.

2. Prior Research

2.1 The Earnings Persistence and the Market Pricing

There is considerable research on the earnings persistence and the market pricing of reported earnings and their components. Sloan (1996) investigates the earnings persistence of current earnings as well as their cash flow and accrual components with respect to one-year-ahead earnings in the United States. He finds that an average persistence parameter of reported earnings is less than 1.0, suggesting that accounting rates of return are mean reverting. More interestingly, his empirical evidence reveals that the earnings persistence parameter of accruals is smaller than that of cash flows, suggesting that accruals are less persistent than cash flows. Extending Sloan (1996), Xie (2001) examines the earnings persistence of cash flows, normal accruals, and abnormal accruals in the United States and documents that cash flows are more persistent than both normal and abnormal accruals, consistent with Sloan (1996) and that abnormal accruals are less persistent than normal accruals. Empirical evidence implies that the quality of cash flows is higher than the quality of accruals and the quality of abnormal accruals used by management to opportunistically manage earnings is lower than the quality of normal accruals.

Sloan (1996) also investigates the market pricing of current earnings as well as their cash flow and accrual components. He uses the nonlinear generalized least squares estimation or the Mishkin (1983) which allows comparisons of the persistence parameters from the forecasting equations (i.e., the forecasting parameters) and the persistence parameters implied in future stock returns from the valuation equations (i.e., the valuation parameters). He finds insignificant differences between the valuation parameter of earnings and its forecasting parameter. However, he documents that the valuation parameter of accruals (cash flows) is greater (smaller) than its forecasting parameter, suggesting that stock markets in the United States overprice (underprice) the persistence of accruals (cash flows). Empirical evidence implies that

investors seem to fixate on earnings, but fail to accurately distinguish between the different levels of persistence of accruals and cash flows.

Extending Sloan (1996), Xie (2001) also uses the Mishkin test to examine the market pricing of cash flows, normal and abnormal accruals in the United States and finds that the valuation parameter of cash flows is smaller than its forecasting parameter while both the valuation parameters of normal and abnormal accruals are greater than their forecasting parameters. The results suggest that stock markets in the United States underprice (overprice) the persistence of cash flows (normal and abnormal accruals). Xie (2001) also discovers that the overpricing appears more severe for the abnormal accruals persistence, relative to the normal accruals persistence.

Pincus et al. (2007) provide empirical evidence on the earnings persistence and the market pricing of earnings and their cash flow and accrual components in 20 countries, including Australia, Canada, Denmark, France, Germany, Hong Kong, India, Indonesia, Italy, Japan, Malaysia, the Netherlands, Singapore, Spain, Sweden, Switzerland, Taiwan, Thailand, the United Kingdom, and the United States. The persistence parameter of earnings for all-country-pooled sample and all sample countries are less than 1.0, indicating that accounting rates of return are mean reverting, consistent with Sloan (1996). Moreover, for all-country-pooled sample, the earnings persistence parameter of accruals is smaller than that of cash flows while results are mixed among countries.

Pincus et al. (2007) find from the Mishkin test that stock markets in 13 countries (i.e., France, Germany, Italy, Japan, Malaysia, the Netherlands, Singapore, Spain, Sweden, Taiwan, Thailand, the United Kingdom, and the United States) misprice the persistence of earnings. Specifically, they find that stock markets in the United States overprice both the persistence of cash flows and accruals while Sloan (1996) finds that they overprice the accruals persistence but underprice the cash flows persistence. They also document that stock markets in Germany, Malaysia, Singapore, and Spain underprice both cash flows and accruals persistence. Investors in Indonesia overprice the cash flows persistence but underprice the accruals persistence. Their empirical evidence also shows that stock markets in Australia, Canada, and the United Kingdom overprice the accruals persistence while results on the mispricing of the cash flows persistence are insignificant. Finally, stock markets in France, Italy, Japan, The Netherlands, Sweden, Switzerland, Taiwan, and Thailand underprice the cash flows persistence while results on the mispricing of the accruals persistence are insignificant.

Vivattanachang and Supattarakul (2013) investigate the earnings persistence of earnings and their cash flow and accrual components with respect to one-year-ahead earnings in Thailand. Consistent with Sloan (1996) and Pincus et al. (2007), their empirical results show that the earnings persistence parameter is less than 1.00, suggesting that accounting rates of return are mean reverting. Their results also suggest the higher

persistence of cash flows, relative to accruals. Furthermore, they use the Mishkin test to investigate the market pricing of earnings and their cash flow and accrual components with respect to one-year-ahead earnings in Thailand. Consistent with Pincus et al. (2007), their results show that the valuation parameter of earnings are significantly lower than its forecasting parameter, suggesting that Thai stock markets underprice the persistence of earnings. Empirical results also reveal that the valuation parameters of accruals and cash flows are significantly smaller than their forecasting parameters, suggesting that Thai stock markets underprice the persistence of both cash flows and accruals. Their results imply that Thai stock markets seem to unable to accurately distinguish between the different levels of persistence of accruals and cash flows.

Supattarakul (2014) investigates the earnings persistence and the market pricing of cash flows, normal accruals, and abnormal accruals with respect to one-year-ahead earnings in Thailand. His results reveal that cash flows are the most persistence and abnormal accruals are the least persistence, consistent with the U.S. evidence documented in Subramanyam (1996) and Xie (2001). His results from the Mishkin test indicate that Thai stock markets underprice the persistence of cash flows and normal accruals but overprice the abnormal accruals persistence.[3] The market overpricing of the abnormal accruals persistence potentially implies that a firm's management choose an income-increasing earnings management approach to opportunistically increase the firm's earnings and investors are unable to detect the earnings management opportunities and consequently overweight the persistence of abnormal accruals.

2.2 Decomposition of Cash Flow Component of Earnings

Cosistent with Dechow et al. (2008), this study decomposes earnings into accrual and cash flow components and further decomposes the cash flow component into three cash flow subcomponents.

We start with the basic accounting equation as follows:

Total Assets = Total Liabilities + Equity (1)

Next, we decompose assets and liabilities into operating assets (OA) and financial assets (FA) and operating liabilities (OL) and finanical liabilities (FL) as follows:

FA + OA = FL + OL + EQUITY (2)

The most common financial assets are cash, short-term investments and long-term investments (CASH) and the most common financial liabilities are short-term and long-term loans (DEBT). Therefore, equation (2) can be rewritten as follows:

CASH + OA = DEBT + OL + EQUITY (3)

[3] Xie (2001) finds that the U.S. stock markets underprice the persistence of cash flows but overprice both the persistence of normal and abnormal accruals while Pincus et al. (2007) finds that Thai stock markets underprice the cash flows persistence but they do not find significant results for normal and abnormal accruals.

Next, we define net operating assets (NOA) as operating assets (OA) minus operating liabilities (OL). Equation (3) can then be rewritten as follows:

$$NOA = DEBT + EQUITY - CASH \quad (4)$$

We then take the first difference of equation (4) and result in the following equation.

$$\Delta NOA = \Delta DEBT + \Delta EQUITY - \Delta CASH \quad (5)$$

The basic clean surplus relations suggest the following two equations.

$$\Delta EQUITY = EARN - CFEQ \quad (6)$$

$$\Delta DEBT = INTEREST\ EXPENSE - INTEREST\ PAID - CFDB \quad (7)$$

where

EARN = Reported earnings or net income,

CFEQ = Net cash flows to equity holders (i.e., ordinary dividends and stock repurchases less equity issurances), and

CFDB = Net non-interest cash flows to debt holders (i.e., debt repayments less debt issuances).

Based on the the basic clean surplus relations (equation (6) and (7)) and an assumption that interest expense is equal to interest paid, equation (5) can be rewritten as follows:

$$\Delta NOA = -CFDB + EARN - CFEQ - \Delta CASH \quad (8)$$

ΔNOA is the comprehensive measure of accounting accruals, denoted as ACC. Thus, equation (8) can be rewritten as follows:

$$ACC = -CFDB + EARN - CFEQ - \Delta CASH \quad (9)$$

Dechow et al. (2008) define free cash flows (FCF) as EARN - ACC. Thus, free cash flows can be defined as follows:

$$FCF = \Delta CASH + CFDB + CFEQ \quad (10)$$

An increase in the cash balance (i.e., positive ΔCASH) represents cash retained by a firm while a decrease in the cash balance (i.e., negative ΔCASH) represents cash used by the firm. Negative net cash flows to debt holders represent net cash distribution to debt holders (i.e., debt repayments exceed debt issuances) while positive net cash flows to debt holders represent net cash flows from debt holders to the firm (i.e., debt issuances exceed debt repayments). Negative net cash flows to equity holders represent net cash distribution to equity holders (i.e., ordinary dividends and stock repurchases exceed equity issuances) while positive net cash flows to equity holders represent net cash flows from equity holders to the firm (i.e., equity issuances exceed ordinary dividends and stock repurchases). Positive free cash flows can be retained by the firm, in which case the cash balance increases, or distributed to equity holders (i.e., ordinary dividends and stock repurchases) or debt holders (i.e., debt replyments). On the other hand, negative free cash flows can be financed by equity holders (i.e., equity issuances) or debt holders (i.e., debt issuances) or by a reduction in the cash balance.

Dechow et al. (2008) argue that cash distributions to equity holders are likely to be more discretionary than cash distributions to debt

holders because debt repayment normally made at present schedule is likely to have less signaling value with respect to future profitability than equity repurchases and increased dividend payment normally made at management's discretion. Dechow et al. (2008) also argue that cash rich firms are more likely to waste their cash on value-decreasing acquisitions or spend their cash on future expenditures on net operating assets that have diminishing returns to investment. Moreover, firms can masquerade their financial positions under their window-dressed balance sheet or misstate their cash balance with unintentional accounting errors or fraudulent financial reporting. Therefore, the cash distribution to equity holders is likely to be the most persistence of the three cash flow subcomponents while the change in the cash balance is likely to be the least persistence of the three cash flows subcomponents.

As for the market pricing of three cash flow subcomponents, investor misperceptions about the different levels of persistence of three cash flow subcomponents suggest that the earnings expectations embedded in stock prices fail to fully reflect the lower persistence of cash retained by the firm and the higher persistence of cash distributed to equity holders.

Stock markets in Thailand are emerging markets with much smaller market capitalization and trading volume, relative to stock markets in other developed countries, e.g., the United States, the United Kingdom, Japan, etc. Moreover, Islam, Watanapalachaikul and Clark (2007) and Tantipanichkul and Supattarakul (2015) empirically reveal that stock markets in Thailand are not efficient. Moreover, empirical evidence on the market mispricing of earnings and their cash flow and accrual components in Thailand is not always identical to that in United States [Sloan (1996), Xie (2001), Pincus et al. (2007), Vivattanachang and Supattarakul (2013), Supattarakul (2014)].

Specifically, Sloan (1996) provides empirical evidence on the earnings persistence and the market mispricing of (i) reported earnings and (ii) cash flows and accruals in the United States. Xie (2001) extends Sloan (1996) and provides empirical evidence on the earnings persistence and the market mispricing of cash flows and both discretionary and nondiscretionary accruals in the United States. Pincus et al. (2007) provide empirical evidence on the earnings persistence and the market mispricing of (i) reported earnings, (ii) cash flows and accruals, and (iii) cash flows and both discretionary and nondiscretionary accruals in 20 countries. Thailand is also included in their sample. Vivattanachang and Supattarakul (2013) provide empirical evidence on the earnings persistence and the market mispricing of (i) reported earnings and (ii) cash flows and accruals of Thai firms while Supattarakul (2014) extends Vivattanachang and Supattarakul (2013) and provides empirical evidence of Thai firms on the earnings persistence and the market mispricing of cash flows and both discretionary and nondiscretionary accruals.

Moreover, Dechow et al. (2008) provide empirical evidence on the earnings persistence and

the market pricing of three cash flow subcomponents (i.e., the change in the cash balance, net cash flows to debt holders, and net cash flows to equity holders) in the United States. The earnings persistence and the market pricing of these three cash flow subcomponents of Thai firms have never been addressed and may not be implied from results in the United States. Therefore, this study aims at providing empirical evidence on the earnings persistence and the market pricing of the three cash flow subcomponents of Thai firms.

3. Sample Selection and Variable Measurements

3.1 Sample Selection

Our sample includes firms listed in the Stock Exchange of Thailand (SET).[4] However, the sample excludes firms in the financials sectors (i.e., banking, finance and securities, and insurance), as well as property funds, and companies under rehabilitation.[5] All required data are obtained from Datastream database. The trimming procedures are applied to dispose extreme values at 0.5^{th} and 99.5^{th} percentile. The final sample consists of 2,664 firm-year observations (379 firms) during 2000 to 2009.

3.2 Variable Measurements

An empirical analysis on the earnings persistence of accruals and cash flows as well as three cash flow subcomponents requires the following variables: (i) EARN, (ii) ACC, (iii) FCF, (iv) ΔCASH, (v) CFDB, and (vi) CFEQ. They are defined as follows:

$EARN_{it}$ = Net income (before extraordinary items) of firm i for year t, deflated by average total assets.

ACC_{it} = Total accruals of firm i for year t, defined as the change in operating assets less the change in operating liabilities, deflated by average total assets. Operating assets are calculated as total assets less cash and short-term investments and operating liabilities are calculated as total liabilities less total debts.

FCF_{it} = Free cash flows of firm i for year t, defined as $\Delta CASH_{it} + CFDB_{it} + CFEQ_{it}$.

$\Delta CASH_{it}$ = Change in the cash balance of firm i for year t, where cash is defined as cash, short-term investments and long-term investments (excluding investments in affiliates), deflated by average total assets.

$CFDB_{it}$ = Net cash flows to debt holders of firm i for year t, defined as a reduction in debts,

[4] The Stock Exchange of Thailand (SET) is a juristic entity set up under the Securities Exchange of Thailand Act, B.E. 2517 (1974). Its mandate is to be a market for the trading of listed securities, a promoter of personal financial planning and provider of related services. Stocks traded in SET are classified into eight sectors: (1) Agro & Food Industry, (2) Consumer Products, (3) Financials, (4) Industrials, (5) Property & Construction, (6) Resources, (7) Services, and (8) Technology.

[5] Property funds are excluded as they themselves are simply listed in the stock market for ease of investor's transferability, and hence their business nature and income are similar to the owner of the fund. Therefore, inclusion of these property funds might cause redundancy and autocorrelation of sample.

deflated by average total assets. Debts defined as total debts in current liabilities plus total debts in non-current liabilities.

$CFEQ_{it}$ = Net cash flows to equity holders of firm i for year t, defined as a reduction in equity plus net income, deflated by average total assets. Equity is defined as total assets minus total liabilities.

In addition, the market pricing of the persistence of accruals and cash flows as well as three cash flow subcomponents requires cumulative abnormal returns (CAR), defined as one-year cumulative size-adjusted abnormal returns, beginning three months after the end of the fiscal year from which the financial statement data are filed with SET.[6]

4. Empirical Tests

4.1 Earnings Persistence

In order to examine the persistence of current earnings, accruals and cash flows as well as three cash flow subcomponents with respect to one-year-ahead earnings, the following OLS regression equations are used.

Model Ia

$$EARN_{t+1} = \beta_0 + \beta_1 EARN_t + e_{t+1}$$

Model IIa

$$EARN_{t+1} = \beta_0 + \beta_2 ACC_t + \beta_3 FCF_t + e_{t+1}$$

Model IIIa

$$EARN_{t+1} = \beta_0 + \beta_2 ACC_t + \beta_4 \Delta CASH_t + \beta_5 CFDB_{it} + \beta_6 CFEQ_t + e_{t+1}$$

β_1 is the persistence parameter of current earnings (model Ia). β_2 is the persistence parameter of total accruals while β_3 is the persistence parameter of free cash flows (model IIa). β_4, β_5 and β_6 are the persistence parameters of three cash flow subcomponents: (1) the change in the cash balance, (2) net cash flows to debt holders, and (3) net cash flows to equity holders, respectively (model IIIa). The F-test is performed to examine whether the persistence parameters of these earnings components are significantly different.

4.2 Market Pricing

In order to investigate the market pricing of the persistence of current earnings, accruals and cash flows as well as three cash flow subcomponents with respect to one-year-ahead earnings, the non-linear generalization least squares estimation or the Mishkin (1983) test is employed. The Mishkin test is widely used for testing the rational expectation

[6] Cumulative abnormal returns is calculated as a difference between a firm's 12-month period buy-and-hold returns, inclusive of dividends, starting from 3 months after the fiscal year-end, and the buy-and-hold returns for the same 12-month period on the market-capitalization-based portfolio decile to which the firm belongs.

of investors in pricing the publicly available information [e.g., Sloan (1996); Xie (2001); Fairfield, Whisenant and Yohn (2003); Hirshleifer, Hou, Teoh and Zhang (2004); Pincus et al. (2007); Dechow et al. (2008); Vivattanachang and Supattarakul (2013); Charoenchit and Supattarakul (2014) and Supattarakul (2014)].

The application of the Mishkin test requires two equations to perform joint estimations using the iterative non-linear least squares regressions. First, the forecasting equation measures a predictive ability of current earnings and their components to one-year-ahead earnings using a linear regression. Next, the valuation equation measures the market pricing of the persistence of current earnings and their components. As a result, valuation parameters estimated from the valuation model can be compared with the persistence parameters estimated from the forecasting equation.

The following system of equations is used to test the market pricing of the persistence of current earnings (model Ib), accruals and cash flows (model IIb) and accruals and three cash flow subcomponents (model IIIb).

Model Ib

Forecasting Equation:

$$EARN_{t+1} = \beta_0 + \beta_1 EARN_t + e_{t+1}$$

Valuation Equation:

$$CAR_{t+1} = \gamma_0 + \gamma_1 (EARN_{t+1} - \beta_0 - \beta_1^* EARN_t) + \varepsilon_t+1$$

Model IIb

Forecasting Equation:

$$EARN_{t+1} = \beta_0 + \beta_2 ACC_t + \beta_3 FCF_t + e_{t+1}$$

Valuation Equation:

$$CAR_{t+1} = \gamma_0 + \gamma_1 (EARN_{t+1} - \beta_0 - \beta_2^* ACC_t - \beta_3^* FCF_t) + \varepsilon_{t+1}$$

Model IIIb

Forecasting Equation:

$$EARN_{t+1} = \beta_0 + \beta_2 ACC_t + \beta_4 \Delta CASH_t + \beta_5 CFDB_{it} + \beta_6 CFEQ_t + \varepsilon_{t+1}$$

Valuation Equation:

$$CAR_{t+1} = \gamma_0 + \gamma_1 (EARN_{t+1} - \beta_0 - \beta_2^* ACC_t - \beta_4^* \Delta CASH_t - \beta_5^* CFDB_{it} - \beta_6^* CFEQ_t) + \varepsilon_{t+1}$$

If the earnings expectations embedded in the one-year-ahead stock returns do not accurately reflect the persistence of earnings (model Ib), accruals and cash flows (model IIb), and accruals and three cash flow subcomponents (model IIIb), β_i^* is expected to be significantly different from β_i, where i = 1 to 6. If β_i^* is significantly greater than β_i, it suggests that the stock market overprices that particular earnings component.

Table 1
Descriptive Statistics and Correlations Analysis

Panel A: Descriptive Statistics

Variable	Mean	Std. Dev.	Min.	P10	P25	Median	P75	P90	Max.
$EARN_{t+1}$	0.055	0.098	-0.531	-0.036	0.016	0.057	0.100	0.152	1.050
$EARN_t$	0.056	0.094	-0.487	-0.040	0.015	0.057	0.100	0.154	0.775
ACC_t	0.040	0.152	-0.759	-0.107	-0.042	0.025	0.106	0.208	1.068
FCF_t	0.016	0.155	-1.037	-0.156	-0.049	0.028	0.101	0.172	0.856
$\Delta CASH_t$	0.006	0.067	-0.330	-0.055	-0.017	0.001	0.025	0.074	0.498
$CFDB_t$	-0.004	0.121	-0.704	-0.140	-0.045	0.000	0.046	0.112	0.681
$CFEQ_t$	0.014	0.102	-0.982	-0.050	0.000	0.018	0.047	0.093	0.764

Panel B: Correlations

Variable	$EARN_t$	ACC_t	FCF_t	$\Delta CASH_t$	$CFDB_t$	$CFEQ_t$	CAR_{t+1}
$EARN_{t+1}$	0.626^{**}	0.073^{**}	0.307^{**}	0.091^{**}	0.053^{**}	0.351^{**}	0.140^{**}
$EARN_t$		0.275^{**}	0.335^{**}	0.171^{**}	0.053^{**}	0.323^{**}	-0.091^{**}
ACC_t			-0.814^{**}	-0.170^{**}	-0.692^{**}	-0.307^{**}	-0.063^{**}
FCF_t				0.270^{**}	0.711^{**}	0.496^{**}	0.009
$\Delta CASH_t$					-0.021	-0.211^{**}	-0.010
$CFDB_t$						-0.090^{**}	0.013
$CFEQ_t$							0.005

**Significant at the 0.01 level.

*Significant at the 0.05 level.

Variable Definitions:

$EARN_t$ is net income before extraordinary items for year t, deflated by average total assets.

ACC_t is total accruals for year t, defined as the change in non-cash assets less the change in non-debt liabilities, deflated by average total assets.

FCF_t is free cash flows for year t, defined as $\Delta CASH_{it} + CFDB_{it} + CFEQ_{it}$.

$\Delta CASH_t$ is the change in the cash balance for year t, where cash is defined a cash and short-term investments and long-term investments (excluding investments in affiliates), deflated by average total assets.

$CFDB_t$ is net cash flows to debt holders for year t, defined as a reduction in debt, deflated by average total assets.

$CFEQ_t$ is net cash flows to equity holders for year t, defined as a reduction in equity plus net income, deflated by average total assets.

CAR_{t+1} is cumulative size-adjusted abnormal returns for year t+1.

5. Empirical Results

5.1 Descriptive Statistics and Correlations

Panel A of Table 1 presents the descriptive statistics while Panel B presents the correlation analysis of all variables for our final sample of 2,664 firm-year observations during 2000-2009.

Mean and median of sample firms' one-year-ahead earnings ($EARN_{t+1}$) and current earnings ($EARN_t$) are positive, suggesting that the sample firms are mainly profitable firms with return on assets of 5.5%, on average. Mean and median of accruals (ACC_t) and free cash flows (FCF_t) are also positive. Mean (median) of ACC_t is greater (less) than mean (median) of FCF_t. Mean and median of the change in the cash balance ($\Delta CASH_t$) and net cash flows to equity holders ($CFEQ_t$) are positive. Mean and median of $CFEQ_t$ are greater than $\Delta CASH_t$. Mean (median) of $CFDB_t$ are negative (positive). This suggests that positive free cash flows of sample firms are mainly obtained from equity holders and retained in the firms, but slightly distributed to debt holders. Mean and median of cumulative abnormal returns (CAR_{t+1}) are negative.

$EARN_{t+1}$ are significantly positively correlated with $EARN_t$, ACC_t and FCF_t as well as all three cash flows subcomponents. This is consistent with the fact that current earnings and their components are persistent with respect to future earnings. CAR_{t+1} are significantly positively correlated with $EARN_{t+1}$, but negatively correlated with $EARN_t$ and ACC_t. However, the correlation between CAR_{t+1} and FCF_t as well as all three cash flows subcomponents are insignificant.

5.2 Earnings Persistence

An estimation of OLS regression models provides empirical evidence on the persistence of current earnings (model Ia), accruals and cash flows (model IIa), and accruals and three cash flow subcomponents: the change in the cash balance, net cash flows to debt holders, and net cash flows to equity holders (model IIIa), with respect to one-year-ahead earnings. Results are presented in table 2.

For model Ia, the persistence parameter of $EARN_t$ (0.652) is significantly positive and less than 1.00, suggesting that accounting rates of return are mean reverting. This is consistent with prior research, e.g., Sloan (1996), Dechow et al. (2008) and Vivattanachang and Supattarakul (2013).

For model IIa, the persistence parameters of ACC_t and FCF_t are significantly positive and the persistence parameter of FCF_t (0.683) is greater than the persistence parameter of ACC_t (0.614). As expected, the empirical evidence suggests the higher earnings persistence of cash flows, relative to accruals. This is consistent with Sloan (1996), Dechow et al. (2008) and Vivattanachang and Supattarakul (2013).

More interestingly, for model IIIa, the persistence parameters of three cash flow subcomponents are significantly positive. Specifically, the persistence parameters of $\Delta CASH_t$, $CFDB_t$, and $CFEQ_t$ are 0.637, 0.630, and 0.768, respectively. The persistence parameters of all three cash flow subcomponents are greater than that of accruals (0.598). This is consistent with Dechow et al.

Table 2

OLS Regression Analysis of the Earnings Persistence

Model Ia: $EARN_{t+1} = \beta_0 + \beta_1 EARN_t + e_{t+1}$

Model IIa: $EARN_{t+1} = \beta_0 + \beta_2 ACC_t + \beta_3 FCF_t + e_t+1$

Model IIIa: $EARN_{t+1} = \beta_0 + \beta_2 ACC_t + \beta_4 \Delta CASH_t + \beta_5 CFDB_{it} + \beta_6 CFEQ_t + e_{t+1}$

	Model Ia (*p*-value)	**Model IIa (*p*-value)**	**Model IIIa (*p*-value)**
Intercept	0.018**	0.019**	0.019**
	(<0.001)	(<0.001)	(<0.001)
$EARN_t$	0.652**		
	(<0.001)		
ACC_t		0.614**	0.598**
		(<0.001)	(<0.001)
FCF_t		0.683**	
		(<0.001)	
$\Delta CASH_t$			0.637**
			(<0.001)
$CFDB_t$			0.630**
			(<0.001)
$CFEQ_t$			0.768**
			(<0.001)
Adjusted R^2	0.391	0.402	0.429

**Significant at the 0.01 level.

*Significant at the 0.05 level.

(2008). In addition, the persistence parameter of $CFEQ_t$ is greater than that of $\Delta CASH_t$ and $CFDB_t$, suggesting that net cash flows to equity holders are the most persistent with respect to one-year-ahead earnings. This is consistent with Dechow et al. (2008).

5.3 Market Pricing

A joint estimation of the linear forecasting models and the non-linear valuation models provides empirical evidence on the market pricing of current earnings (model Ib), accruals and cash flows (model IIb), and accruals and three cash flow subcomponents: the change in the cash balance, net cash flows to debt holders, and net cash flows to equity holders (model IIIb). Results are reported in table 3.

For model Ib, the valuation parameter of $EARN_t$ (0.917) is significantly greater than its persistence parameter (0.652). This suggests that Thai stock market overprices the persistence of current earnings with respect to one-year-ahead earnings, consistent with prior research, e.g., Sloan (1996) and Dechow et al. (2008).

For model IIb, the valuation parameters of ACC_t (0.918) and FCF_t (0.906) are significantly greater than their persistence parameters (0.614 and 0.683, respectively). This suggests that Thai stock market overprices the persistence of both accrual and cash flows with respect to one-year-ahead earnings, consistent with Dechow et al. (2008). We also document that Thai stock market overweights the accrual persistence (0.918), relative to the cash flow persistence (0.906). Recall that the persistence parameter of cash flows (0.683) is greater than that of accruals (0.614). Taken together, it suggests that Thai stock market seems to fail to anticipate the higher persistence of cash flows and the lower persistence of accruals.

More importantly, for model IIIb, the valuation parameters of earnings components are significantly more positive than their persistence parameters, consistent with Dechow et al. (2008). Specifically, the valuation (persistence) parameters of ACC_t, $\Delta CASH_t$, $CFDB_t$, and $CFEQ_t$ are 0.910 (0.598), 0.859 (0.637), 0.886 (0.630), and 0.941 (0.768), respectively. This suggests that Thai stock market overprices accruals and three cash flow subcomponents. In addition, we document that the valuation parameter of $CFEQ_t$ is greater than that of $\Delta CASH_t$, and $CFDB_t$, suggesting that the overpricing of net cash flows to equity holders is greater than that of the change in the cash balance and net cash flows to debt holders. Recall that net cash flows to equity holders are more persistent than the change in the cash balance and net cash flows to debt holders. The fact that net cash flows to equity holders are more persistent than the other two cash flow subcomponents and that the overpricing of net cash flows to equity holders is greater than that of the remaining two cash flow subcomponents imply that Thai stock market seems to anticipate the higher persistence of net cash flows to equity holders and the lower persistence of cash retained in the firm and net cash flows to debt holders. This is consistent with the U.S. evidence found in

Table 3
Nonlinear Regression Analysis of the Earnings Persistence and the Market Pricing

Model Ib

Forecasting Equation:

$EARN_{t+1} = \beta_0 + \beta_1 EARN_t + e_{t+1}$

Valuation Equation:

$CAR_{t+1} = \gamma_0 + \gamma_1 (EARN_{t+1} - \beta_0 - \beta_1^* EARN_t) + \varepsilon_{t+1}$

Model IIb

Forecasting Equation:

$EARN_{t+1} = \beta_0 + \beta_2 ACC_t + \beta_3 FCF_t + e_{t+1}$

Valuation Equation:

$CAR_{t+1} = \gamma_0 + \gamma_1 (EARN_{t+1} - \beta_0 - \beta_2^* ACC_t - \beta_3^* FCF_t) + \varepsilon_{t+1}$

Model IIIb

Forecasting Equation:

$EARN_{t+1} = \beta_0 + \beta_2 ACC_t + \beta_4 \Delta CASH_t + \beta_5^* CFDB_{it} + \beta_6^* CFEQ_t + e_{t+1}$

Valuation Equation:

$CAR_{t+1} = \gamma_0 + \gamma_1 (EARN_{t+1} - \beta_0 - \beta_2^* ACC_t - \beta_4^* \Delta CASH_t - \beta_5^* CFDB_{it} - \beta_6^* CFEQ_t) + \varepsilon_{t+1}$

Forecasting Coefficients		Valuation Coefficients		Test of Market Efficiency
Parameter	**Coeff. Est. (Std. Error)**	**Parameter**	**Coeff. Est. (Std. Error)**	$\beta_i - \beta_i^*$ **Likelihood Ratio (*p*-value)**
Model Ib				
β_1 (EARN)	0.652	β_1^* (EARN)	0.917	22.163
	(0.015)		(0.057)	(<0.001)
Model IIb				
β_2 (ACC)	0.614	β_2^* (ACC)	0.918	13.563
	(0.016)		(0.061)	(0.001)
β_3 (FCF)	0.683	β_3^* (FCF)	0.906	26.179
	(0.016)		(0.060)	(<0.001)
Model IIIb				
β_2 (ACC)	0.598	β_2^* (ACC)	0.910	13.657
	(0.017)		(0.063)	(0.001)
β_4 (ΔCASH)	0.637	β_4^* (ΔCASH)	0.859	26.149
			(0.092)	(<0.001)
β_5 (CFDB)	0.630	β_5^* (CFDB)	0.886	25.988
	(0.019)		(0.074)	(<0.001)
β_6 (CFEQ)	0.768	β_6^* (CFEQ)	0.941	26.484
	(0.018)		(0.068)	(<0.001)

Dechow et al. (2008). Moreover, the fact that accruals are less persistent than the change in the cash balance and net cash flows to debt holders and that the overpricing of accruals is greater than these two cash subcomponents imply that Thai stock market seems to fail to anticipate the lower persistence of accruals, relative to cash retained in the firm and net cash flows to debt holders. This is also consistent with Dechow et al. (2008).

6. Conclusion

Consistent with Dechow et al. (2008), this study decomposes current earnings into accruals and cash flows and, further decomposes free cash flows into three cash flow subcomponents: (1) the change in the cash balance, (2) net cash flows to debt holders, and (3) net cash flows to equity holders. In order to examine the earnings persistence of these earnings components with respect to one-year-ahead earnings, OLS regression is used; in order to examine the market pricing of these earnings components with respect to their implications of one-year-ahead earnings, the Nonlinear Generalized Least Squares Estimation or the Mishkin (1983) test is used. The Mishkin test is widely used for testing the rational expectation of investors in pricing the publicly available information.

Our final sample includes 2,664 firm-year observations listed in the Stock Exchange of Thailand (SET) during 2000-2009. Our empirical results show that Thai stock market overprices current earnings and their accrual and cash flow components as well as three cash flow subcomponents, consistent with Sloan (1996) and Dechow et al. (2008). Our results also suggest that cash flows are more persistent than accruals while accruals are perceived to be more persistent than cash flows, suggesting that Thai stock market seems to fail to anticipate the higher (lower) persistence of cash flows (accruals).

More importantly, this study aims at investigating the earnings persistence and the market pricing of the persistence of accruals and three cash flow subcomponents. Our empirical evidence reveals that all three cash flow subcomponents are more persistent than accruals and that net cash flows to equity holders are more persistent than the remaining two cash flows subcomponents. In addition, we document that accruals are perceived to be less persistent than net cash flows to equity holders, but are perceived to be more persistent than the remaining two cash flow subcomponents. This suggests that Thai stock market seems to anticipate the higher persistence of net cash flows to equity holders and the lower persistence of cash retained in the firm and net cash flows to debt holders, but it seems to fail to anticipate the lower persistence of accruals, relative to cash retained in the firm and net cash flows to debt holders.

This study contributes to the accounting literature by providing empirical evidence on the earnings persistence and the market pricing of the persistence of accruals and cash flows as well as three cash flow subcomponents in Thailand. Our results on the earnings persistence are beneficial to

capital market participants when they are predicting a firm's future earnings in an estimation of the firm's stock price while results of the market pricing are beneficial to them when they are making stock investment decisions. Specifically, our results that Thai stock market seems to fail to anticipate the lower persistence of accruals, relative to cash flows from operations and the two cash flow subcomponents (i.e., cash retained in the firm and net cash flows to debt holders) suggest that investors may be able to form profitable portfolios based on companies' accruals and cash flows as well as cash flow subcomponents. In addition, the overpricing of the persistence of the earnings components in this study contributes to the market efficiency literature.

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