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บทความวิจัย

The Earnings Persistence and the Market Pricing of Earnings and their Cash Flow and Accrual Components of Thai Firms

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ABSTRACT

This study decomposes reported earnings into two main components: the cash flow and accrual components and provides empirical evidence on the earnings persistence and the market pricing of reported earnings and their accrual and cash flow components of Thai firms during 1999-2007. Our results on the persistence of earnings suggest that accounting rates of return are mean reverting, and the results on the persistence of cash flow and accrual components reveal that the cash flow component is more persistent than the accrual component. We also investigate the market pricing of earnings and their cash flow and accrual components using the Mishkin (1983) test. Inconsistent with Sloan (1996), our results suggest that Thai stock markets underprice the persistence of reported earnings and both cash flow and accrual components, and that Thai stock markets perceive the accrual component to be more persistent than the cash flow component. Possible explanations are that Thai stock markets are emerging markets with much smaller market capitalization and trading volume, relative to developed

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capital markets such as U.S. stock markets, and that Thai stock markets are not efficient [Islam et al. (2007) and Tantipanichkul and Supattarakul (2011)].

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

บทคัดย่อ

งานวิจัยนี้แยกองค์ประกอบของกำไร (Earnings) เป็น 2 องค์ประกอบ ได้แก่ กระแสเงินสด (Cash Flow) และรายการคงค้าง (Accrual) และแสดงหลักฐานเชิงประจักษ์เกี่ยวกับความคงอยู่ในกำไรในอนาคต (Earnings Persistence) และการรับรู้ของตลาดทุนเกี่ยวกับความคงอยู่ของกำไรในอนาคต (Market Pricing) ของกำไร กระแสเงินสด และรายการคงค้างของบริษัทในประเทศไทยระหว่างปี พ.ศ. 2542 ถึงปี พ.ศ. 2550 ผลวิจัยเกี่ยวกับความคงอยู่ในกำไรในอนาคตของกำไรในปัจจุบันพบว่าอัตราผลตอบแทนทางบัญชีเข้าลักษณะกลับสู่ค่าเฉลี่ย (Mean Reverting) และผลวิจัยเกี่ยวกับความคงอยู่ในกำไรในอนาคตของกระแสเงินสดและรายการคงค้างพบว่ากระแสเงินสดมีความคงอยู่ในกำไรในอนาคตสูงกว่ารายการคงค้าง งานวิจัยนี้ศึกษาการรับรู้ของตลาดทุนเกี่ยวกับความคงอยู่ในกำไรในอนาคตของของกระแสเงินสดและรายการคงค้างโดยใช้วิธีทดสอบที่เสนอโดย Mishkin (1983) ซึ่งพบว่าตลาดทุนในประเทศไทยรับรู้ความคงอยู่ในกำไรในอนาคตของกำไร กระแสเงินสด และรายการคงค้างต่ำเกินไป และยังรับรู้ว่ารายการคงค้างมีความคงอยู่ในกำไรในอนาคตสูงกว่ากระแสเงินสด โดยผลวิจัยที่พบนี้แตกต่างจากผลวิจัยที่พบโดย Sloan (1996) ซึ่งศึกษาในบริบทของตลาดทุนในประเทศสหรัฐอเมริกา ทั้งนี้ คำอธิบายที่เป็นไปได้น่าจะเป็นเพราะตลาดทุนในประเทศไทยเป็นตลาดทุนเกิดใหม่ (Emerging Markets) ซึ่งมีขนาดเล็กกว่าและมีปริมาณการซื้อขายน้อยกว่าตลาดทุนที่พัฒนาแล้วอย่างตลาดทุนในประเทศสหรัฐอเมริกา นอกจากนี้ยังมีหลักฐานว่าตลาดทุนในประเทศไทยเป็นตลาดทุนไม่มีประสิทธิภาพ [Islam et al. (2007) and Tantipanichkul and Supattarakul (2011)]

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Introduction

Prior research has shown that accounting earnings can be decomposed into two main components: cash flow and accrual components. Sloan (1996) investigates the earnings persistence of reported earnings and their cash flow and accrual components and finds that the accrual component is less persistent than the cash flow component. Moreover, Sloan (1996) examines the market pricing of earnings and their cash flow and accrual components and documents that stock prices act as if investors fixate of earnings. In other words, investors fail to fully reflect information in the cash flow and accrual components of earnings about future earnings.

Many prior studies extend Sloan (1996) by further decomposing accounting earnings into several components and their results are consistent with Sloan (1996). For example, Subramanyam (1996) and Xie (2001) further decompose the

accrual component into two subcomponents: nondiscretionary and discretionary accrual components and examine the persistence of these components. Dechow et al. (2008) further decompose the cash flow component into three subcomponents: cash balance, debt, and equity.

Prior studies mentioned above examine the earnings persistence and the market pricing of cash flow and accrual components of U.S. stock markets. Thai stock markets are dramatically smaller, in terms of market capitalization and trading volume, relative to U.S. stock markets. Consequently, the persistence of earnings and their cash flow and accrual components of Thai listed firms may be different from that of U.S. firms and Thai and U.S. stock markets may behave differently in terms of the pricing of earnings and their cash flow and accrual components. Therefore, this study aims at investigating the earnings persistence and market pricing of reported earnings and their cash flow and accrual components of Thai listed firms.

Our sample includes firms (2,225 firm-year observations) listed in the Stock Exchange of Thailand (SET) during 1999–2007, excluding firms in financials industry, financial-distressed firms, and property funds. Our results on the earnings persistence of reported earnings show that earnings are persistent with a persistence coefficient of less than 1.00, suggesting that accounting rates of accounting are mean reverting. Moreover, our empirical results on the earnings persistence of the cash flow and accrual components suggest the higher persistence of the cash flow component, relative to the accrual component.

This study uses the Mishkin (1983) test to investigate the market pricing of earnings and their cash flow and accrual components. This framework is widely used for testing the rational expectation of investors in pricing the publicly available information [e.g., Sloan (1996), Xie (2001), Fairfield et al. (2003), Hirshleifer et al. (2004), and Dechow et al. (2008)]. The forecasting and valuation models are jointly estimated. The forecasting parameter represents the earnings persistence parameter of earnings components while the valuation parameter represents the market pricing of earnings components.

Sloan (1996) finds that U.S. stock markets accurately price the persistence of reported earnings since the valuation parameter of reported earnings is not significantly different from the forecasting parameter of reported earnings. Our results on Thai stock markets, however, show that the valuation parameter of reported earnings are significantly lower that its forecasting parameter, suggesting that Thai stock markets underprice the persistence of reported earnings.

Our results on an estimation of the non-linear valuation model with the cash flow and accrual components show that the valuation parameters of the accrual and cash flow components are significantly smaller than their forecasting parameters, suggesting that Thai stock markets also underprice both cash flow and accrual components and that Thai stock markets perceive the accrual component to be more persistent than the cash flow component.

Ball and Shivakumar (2006) and Anderson et al. (2009) suggest that the valuation parameters are affected from signs of firm operating performance. Therefore, we also estimate the valuation model for a profit-firm subsample. The results show that the valuation and forecasting parameters of the accrual component are not significantly different while the valuation parameter of the cash flow component is significantly smaller than its forecasting parameter, suggesting that stock prices accurately reflect the persistence of the accrual component but inaccurately the higher persistence of the cash flow component. The results also suggest that Thai stock markets perceive that the cash flow component is less persistent than the accrual component.

Our empirical results of Thai firms are inconsistent with empirical results of U.S. firms documented in Sloan (1996). Possible explanations are that Thai stock markets are emerging markets with much smaller market capitalization and trading volume, relative to developed capital markets such as U.S. stock markets, and that Thai stock markets are not efficient [Islam et al. (2007) and Tantipanichkul and Supattarakul (2011)].

Our study contributes to the accounting literature by providing empirical evidence on the earnings persistence of reported earnings and their cash flow and accrual components of emerging markets (i.e., Thai stock markets). Although Thai listed firms during our sample period have not fully implemented International Financial Reporting Standards (IFRSs) in preparing their financial statements, reported earnings of Thai firms are persistent with a persistence coefficient of less than 1.0 implying a mean-reverting accounting rate of return. Moreover, our results on the earnings persistence of the cash flow and accrual components of earnings suggest the higher persistence of the cash flow component, relative to the accrual component, consistent with prior studies for developed capital markets (i.e., U.S. stock markets). The results are beneficial to financial analysts and investors of Thai listed firms in that when they are predicting a firm's future earnings in an estimation of the firm's stock price, they should take into account the differential persistence of the cash flow and accrual components of current earnings. In addition, our results that stock prices do not accurately reflect information in the cash flow and accrual components of earnings with respect to one-year-ahead earnings suggest that Thai investors can possibly earn abnormal returns from the mispricing of these earnings components.

The remainder of this paper is organized as follows. Section 2 discusses prior research on the earnings persistence and the marketing pricing of reported earnings and their cash flow and accrual component. Section 3 describes the sample selection criteria, variable measurements, and model specifications. Empirical tests and results are discussed in Section 4. The final section concludes the paper.

Prior Research and Hypothesis Development

1. The Persistence of Earnings and their Cash Flow and Accrual Components

A common use of financial statement information is to assess a company's future cash flows generating capability. There is considerable research investigating whether cash basis or accrual basis is a superior predictor of future cash flows and stock returns. Dechow et al. (1998) and Dechow and Dichev (2002) show that accrued accounting earnings are superior to cash accounting earnings in reflecting the firm performance. Although some argue that accruals contain numerous estimates with respect to the defferal and accrual of revenues and expenses embeded into financial statements and consequently, management may opportunisticlly manipulate firm operating performance. As a result, the quality of accrual accounting earnings is compromised, relatively cash accounting earnings.

Many prior studies decompose reported earnings into several components. Bowen et al. (1987), Bernard and Stober (1989) and Sloan (1996) decompose reported earnings into two components: the cash flow and accrual components.

Sloan (1996) examines the earnings persistence of reported earnings as well as the cash flow and accrual components with respect to one-year-ahead earnings and documents that an average persistence parameter of reported earnings is approximately 0.8, suggesting that accounting rates of return are mean reverting. His empirical evidence further reveals that the persistence of reported earnings is decreasing in the magnitude of the accrual component and increasing in the magnitude of the cash flow component. In other words, the earnings persistence parameter of the accrual component is smaller than that of the cash flow component, suggesting that the accrual component is less persistent than the cash flow component.

The evidence that the cash flow component is more persistent than the accrual component is consistent with that the quality of the cash flow component is higher than the quality of the accrual component. Therefore, if the quality of the accrual component of Thai listed firms, which is comply with Thai Financial Reporting Standards (TFRSs), is lower than the quality of the cash flow component of reported earnings of Thai listed firms, the accrual component is expected to be less persistent than the cash flow component.

2. The Pricing of Earnings and their Cash Flow and Accrual Components

Prior research has documented information content of reported earnings and the cash flow and accrual components with respect to contemporaneous stock returns [e.g., Bowen et al. (1987), Bernard and Stober (1989), Ou (1990), Abarbanell and Bushee (1997), and Chen and Zhang (2007)]. Moreover, prior research has also documented a relationship between reported earnings and the cash flow and accrual components with respected to one-year-ahead stock returns. For example, Subramanyan (1996) examines linear associations between future stock returns and

firm performance meaures: net income, operating cash flows, total accruals, and non-discretionary and discretionary accruals and finds that all firm performance measures are siginicantly positively associated with future stock returns.

Moreover, Sloan (1996) uses Mishkin (1983) test to examine whether stock prices fully reflect the persistence of the earnings and their cash flow and accrual components. The non-linear regression suggested by Mishkin (1983) allows him to compare the persistence parameters of earnings and their cash flow and accrual components from the forecasting equations to the persistence parameters implied in future stock returns from the valuation equations. Sloan (1996) finds that the persistence parameter of earnigns from the valuation model is not sigificantly different from its parameter from the forecasting model. He also documents that the persistence parameter of the accrual (cash flow) component from the valuation equation is greater (smaller) than the persistence parameter of the accrual (cash flow) component from the forecasting equation. The results suggest that U.S. stock markets overprice (underprice) the accrual (cash flow) components.

Thai stock markets are emerging markets with much smaller market capitalization and trading volume, relative to developed capital markets such as U.S. stock markets. Moreover, Islam et al. (2007) and Tantipanichkul and Supattarakul (2011) reveal that Thai stock markets are not efficient. Specifically, their results suggest that there is an opportunity for financial analysts and investors to earn extraordinary gains by using historical financial information to form hedged portfolio. Therefore, we expect that stock prices of Thai firms do not accurately reflect the persistence of reported earnings and their cash flow and accrual components.

Sample Selection, Variable Measurements, and Model Specifications

1. Sample Selection

Stock markets in Thailand consist of two markets: the Stock Exchange of Thailand (SET) and the Market of Alternative Investment (mai).[1] Stocks traded in SET are classified into 8 industries as shown in Table 1. Our sample include only firms listed in SET because firms listed in mai are significantly smaller in size and trading volume, relative to firms listed in SET. We then exclude form our sample firms in financials, financial-distressed firms, property fund, and new entrants in 2008 and 2009. Our sample period is 1999–2007. Moreover,

1 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 while the Market for Alternative Investment (MAI) has been established under the Securities Exchange of Thailand Act. The objective is to create new fund-raising opportunities for innovative business with high potential growth as well as provide a greater range of investment alternatives for investors. It officially commenced operation on June 21, 1999.

Table 1 Summary of Final Sample during 1999–2007

Panel A: Industry coverage		
1. Agro & Food Industry	2. Property & Construction	
3. Consumer Products	4. Resources	
5. Financials	6. Services	
7. Industrials	8. Technology	
Panel B: Number of firms included in final sample		
Total number of firms listed in SET (as of Oct. 29, 2009)		558
Exclusions:		
Firms listed in mai	57	
Firms in Financials	62	
Property Funds	25	
Financial-Distressed Firms	22	
New Entrants in 2008 and 2009	10	
Final sample firms		382
Panel C: Number of firm-year observations from 382 sample firms		
Initial firm-year observations		2,820
Exclusions:		
Observations with missing data	31	
Observations with 1% extreme values at both ends	464	
Final sample firms		2,325

we further eliminate firm-year observations with missing required data on SETSMART[2] and firm-year observations with 1% extreme values at both ends. As shown in Table 1, our final sample consists of 2,325 firm-year observations.

2. Variable Measurements

The empirical analysis on the earnings persistence of the reported earnings and their cash flow and accrual components requires three earnings variables: (i) earnings (EARN), (ii) cash flow

2 SETSMART (SET Market Analysis and Reporting Tool) is the web-based application from the Stock Exchange of Thailand (SET) that can seamlessly integrate comprehensive sources of Thai listed company data, i.e., historical stock prices, historical indices, listed company profile, and historical news.

component (CFO), and (iii) accrual component (ACC). They are defined as follows:

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

CFO_{it} = Cash from operating activities deflated by average total assets of firm i for year t, and

ACC_{it} = Accruals of firm i for year t defined as $EARN_{it} - CFO_{it}$

In addition to three earnings variables defined above, the market pricing of the earnings persistence of reported earnings and their cash flow and accrual components requires future stock returns. Following Sloan (1996), future stock returns (CAR) are defined as one-year cumulative size-adjusted returns beginning three months after the end of the fiscal year from which the financial statement data are filed with SET.

3. Model Specifications

3.1 The Earnings Persistence of Earnings and their Cash Flow and Accrual Components

In order to examine the earnings persistence of reported earnings and their cash flow and accrual components with respect to one-year-ahead earnings, the following regression equations are used.

The Earnings Persistence of Reported Earnings:

$$EARN_{it+1} = \alpha_0 + \alpha_1 EARN_{it} + \varepsilon_{it} \quad (1)$$

The Earnings Persistence of the Cash Flow and Accrual Components:

$$EARN_{it+1} = \beta_0 + \beta_1 ACC_{it} + \beta_2 CFO_{it} + \varepsilon_{it} \quad (2)$$

The accrual component is expected to be less persistent with respected to one-year-ahead earnings than the cash flow component. Therefore, β_1 is expected to be less than β_2.

3.2 The Market Pricing of Earnings and their Cash Flow and Accrual Components

Following Sloan (1996) in order to investigate the market pricing of reported earnings and their cash flow and accrual components, we use Mishkin (1983) test. This framework is widely used for testing the rational expectation of investors in pricing the publicly available information [e.g., Sloan (1996), Xie (2001), Fairfield et al. (2003), Hirshleifer et al. (2004), and Dechow et al. (2008)]. The rational expectation implication indicates that the expectation assessed by the markets equals the true conditional expectation using all available historical information. To test an application of rational expectations to financial markets which is referred as the market efficiency.

The Market Efficiency Model:

$$E(y_{t+1} - \hat{y}_{t+1} \mid \phi_t) = 0 \quad (3)$$

where

ϕ_t = the set of infornation publicly available at time t,

$E(...\mid \phi_t)$ = the objective expectation condition on ϕ_t,

y_{t+1} = the return from holding a particular security from t to t+1,

$\hat{y}_{t+1}$ = the market's subjective expectation where market is in equilibium and provides a "normal" return, and

$y_{t+1} - \hat{y}_{t+1}$ = the abnormal returns which is positively correlated with historical informaion at the time t.

A model that satisfies the efficient-markets condition in (3) is

$$(y_{t+1} - \hat{y}_{t+1} \mid \phi_t) = \beta(X_{t+1} - X^e_{t+1}) + \varepsilon_{t+1} \quad (4)$$

where

X_{t+1} = the vector containing variables relevant to the pricing of the security at the time t+1,

X^e_{t+1} = the vector of one-period-ahead rational forecasts of X_{t+1} that is, $X^e_{t+1} = E(X_{t+1} \mid \phi_t)$,

β = a valuation coefficient, and

ε_{t+1} = a disturbance with the property $E(\varepsilon_t \mid \phi_t) = 0$.

The application of above models to test the market pricing on current earnings and their cash flow and accrual components requires two equations to perform jointly estimations using the iterative non-linear least squares regressions. First, the forecasting equation measures a predictive ability of current earnings and their cash flow and accrual components to one-year-ahead earnings using a linear regression. Next, the valuation equation measures the market pricing of current earnings and their cash flow and accrual components resulting in valuation parameters to be compared with the persistence parameters estimated from the forecasting equation. If the market is efficient, the differences between the persistence parameters from the forecasting and the valuation equations will be insignificant. If the valuation parameters significantly exceed the forecasting parameters it implies that investors overprice the persistence of earnings components with respected to one-year-ahead earnings.

The following system of equations is used to test the market pricing of the earnings persistence of reported.

The Forecasting Equation:

$$EARN_{it+1} = \alpha_0 + \alpha_1 EARN_{it} + \varepsilon_{it} \quad (5)$$

The Valuation Equation:

$$CAR_{it+1} = \gamma(EARN_{it+1} - \alpha_0 - \alpha^*_1 EARN_{it}) + \varepsilon_{it} \quad (6)$$

As in Mishkin (1983), we jointly estimate equations (5) and (6) using the iterative non-linear least squares estimation procedure. In the first stage, we jointly estimate equations (5) and (6) without imposing any constraint on the equations. To test whether the valuation parameter significantly differs from the forecasting parameter, in the second stage, we impose constraint that $\alpha_1 = \alpha^*_1$.

If the earnings expectations embedded in the one-year-ahead stock returns do not accurately

reflect the earnings persistence of reported earnings, α_1 is expected to be significantly different from α_1^*.

The following system of equations is used to test the market pricing of the cash flow and accrual components.

The Forecasting Equation:

$$EARN_{it+1} = \beta_0 + \beta_1 ACC_{it} + \beta_2 CFO_{it} + \varepsilon_{it} \quad (7)$$

The Valuation Equation:

$$CAR_{it+1} = \lambda(EARN_{it+1} - \beta_0 - \beta_1^* ACC_{it} - \beta_2^* CFO_{it}) + \varepsilon_{it} \quad (8)$$

Similarly, we test the market pricing of the cash flow and accrual components of reported earnings efficiency by imposing the constraints that $\beta_1 = \beta_1^*$ and/or $\beta_2 = \beta_2^*$ in the second stage.

If the earnings expectations embedded in the one-year-ahead stock returns do not accurately reflect the higher earnings persistence of the cash flow component of reported earnings and the lower earnings persistence of the accrual component of reported earnings, β_1^* is expected to be significantly greater than β_1 and/or β_2^* is expected to be significantly less than β_2.

Mishkin (1983) shows that the following likelihood ratio statistic is distributed asymptotically as $\chi^2(q)$ under the null hypothesis that the market rationally prices one or more earnings components with respect to their associations with one-year-ahead earnings. The likelihood ratio tests the neutrality and rationality by comparing the sum of squared residuals of the unconstrained system with that of the constrained system as follows:

$$2n \ln(SSR^c/SSR^u) \quad (9)$$

where

q = the number of constraints imposed for rational pricing test,

n = the number of sample observations,

SSR^c = the sum squared residuals from the constrained system, and

SSR^u = the sum squared residuals from the unconstrained system.

Empirical Tests and Results

1. Descriptive Statistics and Correlation Analysis

Panel A of Table 2 presents the descriptive statistics while Panel B presents the correlation analysis of all variables for our final sample of 2,323 firm-year observations during 1999–2007. Mean and median of sample firms' reported earnings ($EARN_t$) and one-year-ahead earnings ($EARN_{t+1}$) as well as the cash flow component (CFO_t) are positive. Mean and median of $EARN_t$ are less positive than CFO_t. As a result, mean and median of ACC_t are negative. These are consistent with Sloan (1996) and Xie (2001).

$EARN_t$ and $EARN_{t+1}$ are significantly positively correlated with a correlated coefficient of 0.658. This is consistent with that accounting rates of return are mean reverting. $EARN_{t+1}$ and CFO_t are significantly positive and $EARN_{t+1}$ and ACC_t are also significantly positive. CAR_{t+1} are significantly positively correlated with $EARN_t$, CFO_t, and ACC_t. The correlated coefficients of slightly greater

Table 2 Descriptive Statistics and Correlation Analysis of 2,325 Firm-Year Observations during 1999–2007

Panel A: Descriptive Statistics

	Mean	Median	Standard Deviation	Maximum	Minimum
$EARN_t$	0.0405	0.0529	0.1184	0.4503	–0.7662
$EARN_{t+1}$	0.0434	0.0533	0.1034	0.4401	–0.5730
CFO_t	0.0781	0.0742	0.1167	0.6294	–0.3806
ACC_t	–0.0237	–0.0270	0.1220	0.6257	–0.6579
CAR_{t+1}	0.0081	–0.0255	0.4493	1.8629	–1.3684

Panel B: Correlation Analysis

	$EARN_{t+1}$	CFO_t	ACC_t	CAR_{t+1}
$EARN_t$	0.658**	0.433**	0.169**	0.052*
$EARN_{t+1}$		0.403**	0.462**	0.052*
CFO_t			–0.580**	0.003
ACC_t				0.043*

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

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

Variable Definitions:
$EARN_t$ is net income before extraordinary items for year t,
$EARN_{t+1}$ is net income before extraordinary items for year t+1,
CFO_t is cash flows from operating activities for year t,
ACC_t is defined as $EARN_t - CFO_t$, and
CAR_{t+1} is cumulative size-adjusted returns for year t+1.

than 0 seem to suggest that stock prices do not accurately reflect the earnings persistence of reported earnings and their cash flow and accrual components.

2. The Persistence of Earnings and their Cash Flow and Accrual Components

An estimation of the forecasting equation provides empirical evidence on the persistence of reported earnings and their cash flow and accrual components with respect to one-year-ahead earnings. Panel A of Table 3 presents results for a full sample of 2,325 firm-year observations. The forecasting parameter or the earnings persistence parameter of reported earnings is significantly positive with the parameter of 0.574 which is less than 1.0. Thus, this is consistent with Sloan (1996) that accounting rates of return are mean

Table 3 Linear and Nonlinear (The Mishkin Test) Regression Analysis of the Persistence and Pricing of Earnings during 1999–2007

Forecasting Equation:

$EARN_{it+1} = \alpha_0 + \alpha_1 EARN_{it} + \varepsilon_{it}$

Valuation Equation:

$CAR_{it+1} = \gamma(EARN_{it+1} - \alpha_0 - \alpha_1^* EARN_{it}) + \varepsilon_{it}$

Panel A: Full sample – 2,325 firm-year observations

Forecasting Parameters			Valuation Parameters		
Parameter	Estimate	Asymptotic Std. Error	Parameter	Estimate	Asymptotic Std. Error
α_0	0.020**	0.002	Γ	0.138	0.120
$\alpha_1(EARN_t)$	0.574**	0.014	$\alpha_1^*(EARN_t)$	−0.864	1.358
Adjusted R^2 = 0.433					

Tests of rational pricing of earnings

Null Hypothesis	Likelihood Ratio Statistic	Marginal Significance Level
$\alpha_1^* = \alpha_1$	14.2315	0.0002

Panel B: Subsample of profit firms – 1,625 firm-year observations

Forecasting Parameters			Valuation Parameters		
Parameter	Estimate	Asymptotic Std. Error	Parameter	Estimate	Asymptotic Std. Error
α_0	0.035**	0.002	Γ	0.269	0.223
$\alpha_1(EARN_t)$	0.545**	0.017	$\alpha_1^*(EARN_t)$	0.357	0.370
Adjusted R^2 = 0.385					

Tests of rational pricing of earnings

Null Hypothesis	Likelihood Ratio Statistic	Marginal Significance Level
$\alpha_1^* = \alpha_1$	0.6210	0.4307

* Coefficient is significant at the 0.05 level (2-tailed).

** Coefficient is significant at the 0.01 level (2-tailed).

Variable Definitions:

$EARN_t$ is net income before extraordinary items for year t,

$EARN_{t+1}$ is net income before extraordinary items for year t+1,

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

Likelihood ratio statistic is defined as $2n \ln(SSR^c/SSR^u)$ where n is the number of sample observations, SSR^c is the sum squared residuals from the constrained system, and SSR^u is the sum squared residuals from the unconstrained system.

Table 4 Linear and Nonlinear (The Mishkin Test) Regression Analysis of the Persistence and Pricing of the Cash Flow and Accrual Components during 1999–2007

Forecasting Equation:

$EARN_{it+1} = \beta_0 + \beta_1 ACC_{it} + \beta_2 CFO_{it} + \varepsilon_{it}$

Valuation Equation:

$CAR_{it+1} = \lambda(EARN_{it+1} - \beta_0 - \beta_1^* ACC_{it} - \beta_2^* CFO_{it}) + \varepsilon$

Panel A: Full sample – 2,325 firm-year observations

Forecasting Parameters			Valuation Parameters		
Parameter	Estimate	Asymptotic Std. Error	Parameter	Estimate	Asymptotic Std. Error
β_0	–0.006**	0.001	Λ	0.239	0.274
$\beta_1(ACC_t)$	0.888**	0.007	$\beta_1^*(ACC_t)$	0.296	0.782
$\beta_1(CFO_t)$	0.896**	0.007	$\beta_2^*(CFO_t)$	–0.015	1.101
Adjusted R^2 = 0.892					

Tests of rational pricing of the cash flow and accrual components of earnings

Null Hypothesis	Likelihood Ratio Statistic	Marginal Significance Level
$\beta_1^* = \beta_1(ACC_t)$	4.731	0.0300
$\beta_2^* = \beta_2(CFO_t)$	14.279	<0.0000
$\beta_1^* = \beta_1$ and $\beta_2^* = \beta_2$	14.278	0.0008

Panel B: Subsample of profit firms – 1,625 firm-year observations

Forecasting Parameters			Valuation Parameters		
Parameter	Estimate	Asymptotic Std. Error	Parameter	Estimate	Asymptotic Std. Error
β_0	0.015**	0.001	Λ	0.201	0.434
$\beta_1(ACC_t)$	0.670**	0.008	$\beta_1^*(ACC_t)$	0.666	0.573
$\beta_1(CFO_t)$	0.704**	0.008	$\beta_2^*(CFO_t)$	0.078	1.418
Adjusted R^2 = 0.838					

Tests of rational pricing of the cash flow and accrual components of earnings

Null Hypothesis	Likelihood Ratio Statistic	Marginal Significance Level
$\beta_1^* = \beta_1(ACC_t)$	<0.000	1.000
$\beta_2^* = \beta_2(CFO_t)$	4.667	0.031
$\beta_1^* = \beta_1$ and $\beta_2^* = \beta_2$	7.540	0.023

* Coefficient is significant at the 0.05 level (2-tailed).

** Coefficient is significant at the 0.01 level (2-tailed).

Table 4 Linear and Nonlinear (The Mishkin Test) Regression Analysis of the Persistence and Pricing of the Cash Flow and Accrual Components during 1999–2007 (Cont.)

Variable Definitions:
$EARN_{t+1}$ is net income before extraordinary items for year t+1,
CFO_t is cash flows from operating activities for year t,
ACC_t is defined as $EARN_t - CFO_t$, and
CAR_{t+1} is cumulative size-adjusted returns for year t+1.

Likelihood ratio statistic is defined as $2n \ln(SSR^c/SSR^u)$ where n is the number of sample observations, SSR^c is the sum squared residuals from the constrained system, and SSR^u is the sum squared residuals from the unconstrained system.

reverting. We also estimate the forecasting model for a profit-firm subsample of 1,625 firm-year observations and results are reported in Panel B of Table 3. The results are qualitatively identical to results for a full sample.

Panel A of Table 4 reports results from an estimation of the forecasting model providing evidence on the earnings persistence of the cash flow and accrual components of earnings for a full sample while Panel B reports the results from a profit-firm subsample. The forecasting parameters or the earnings persistence parameters of CFO_t and ACC_t are significantly positive. The parameter of CFO_t ($\beta_2 = 0.896$) is greater than that of ACC_t ($\beta_1 = 0.888$) for a full sample. The results from a profit-firm subsample are consistent with those from a full sample ($\beta_1 = 0.870$ and $\beta_2 = 0.704$). As expected, the empirical evidence suggests that the higher earnings persistence of the cash flow component of earnings relative to the accrual component of earnings, consistent with Sloan (1996). Our evidence that the cash flow component of earnings of Thai firms is more persistent than the accrual component of earnings is consistent with that the quality of the cash flow component is higher than the quality of the accrual component of earnings.

3. The Pricing of Earnings and their Cash Flow and Accrual Components

An estimation of the non-linear valuation model provides empirical evidence on the market pricing of reported earnings. Panel A of Table 3 presents results for a full sample of 2,325 firm-year observations. Sloan (1996) finds that U.S. stock markets accurately price the persistence of reported earnings since the valuation parameter of reported earnings is not significantly different from the forecasting parameter of reported earnings. Our results reported in Panel A of Table 3 show that the valuation parameter of reported earnings ($EARN_t$) are significantly lower that its forecasting parameter, suggesting that Thai stock markets underprice the persistence of reported earnings.

Possible explanations are that Thai stock markets are emerging markets with much smaller market capitalization and trading volume, relative to developed capital markets such as U.S. stock markets and that Thai stock markets are not efficient [Islam et al. (2007) and Tantipanichkul and Supattarakul (2011)].

Ball and Shivakumar (2006) and Anderson et al. (2009) suggest that the valuation parameters are affected from signs of firm operating performance. Thus, we estimate the valuation model for a profit-firm subsample. Results are reported in Panel B of Table 3. Our empirical evidence suggests that stock prices of Thai firms do not accurately reflect the persistence of reported earnings with respect to one-year-ahead earnings. Specifically, the valuation parameter of $EARN_t$ ($\alpha_1^* = 0.357$) is smaller than its forecasting parameter ($\alpha_1 = 0.545$); however, the result is not significant at a conventional level.

Results on an estimation of the valuation model with the cash flow and accrual components of earnings for our full sample of 2,325 firm-year observations are reported on Panel A of Table 4. Our results show that the valuation parameters of ACC_t and CFO_t are significantly smaller than their forecasting parameters. Our results suggest that Thai stock markets underprice both cash flow and accrual components of earnings and that Thai stock markets perceive the accrual component to be more persistence than the cash flow component.

We also estimate the valuation model for a profit-firm subsample of 1,625 firm-year observations. The results are reported in Panel B of Table 4. The valuation parameter of ACC_t and its forecasting parameter are not significantly different ($\beta_1^* = 0.666$ and $\beta_1 = 0.670$). However, the valuation parameter of CFO_t ($\beta_2^* = 0.078$) is significantly smaller than its forecasting parameter ($\beta_2 = 0.704$). The evidence suggests that stock prices of Thai firms accurately reflect the persistence of the accrual component while inaccurately the higher persistence of the cash flow component. It also suggests that Thai stock markets perceive that the accrual component is more persistent than the cash flow component.

Our empirical results of Thai firms are inconsistent with empirical results of U.S. firms documented in Sloan (1996). Possible explanations are that Thai stock markets are emerging markets with much smaller market capitalization and trading volume, relative to developed capital markets such as U.S. stock markets and that Thai stock markets are not efficient [Islam et al. (2007) and Tantipanichkul and Supattarakul (2011)].

Conclusion

The objective of this study is to provide empirical evidence on the earnings persistence and the market pricing of reported earnings and the cash flow and accrual components of Thai listed firms. Our sample includes firms (2,325 firm-year observations) listed in the Stock Exchange of Thailand (SET) during 1999–2007. Our results on the persistence of current earnings with respect to one-year-ahead earnings show that current earnings are persistent with a persistence coefficient of less than 1.00 suggesting that accounting rates of accounting are mean reverting. Moreover, our

empirical results on the persistence of the cash flow and accrual components suggest the higher persistence of the cash flow component, relative to the accrual component.

Results on an estimation of the non-linear valuation model with the cash flow and accrual components show that the valuation parameters of the accrual and cash flow components are significantly smaller than their forecasting parameters. Our results suggest that Thai stock markets underprice both cash flow and accrual components and they perceive the accrual component to be more persistent than the cash flow component.

We also estimate the valuation model for a profit-firm subsample. The results show that the valuation and forecasting parameters of the accrual component are not significantly different while the valuation parameter of the cash flow component is significantly smaller than its forecasting parameter, suggesting that stock prices of Thai firms accurately reflect the persistence of the accrual component but inaccurately reflect the higher persistence of the cash flow component. Our results also suggest that Thai stock markets perceive that the accrual component is more persistent than the cash flow component.

Our empirical results of Thai firms are inconsistent with empirical results of U.S. firms documented in Sloan (1996). Possible explanations are that Thai stock markets are emerging markets with much smaller market capitalization and trading volume, relative to developed capital markets such as U.S. stock markets, and that Thai stock markets are not efficient [Islam et al. (2007) and Tantipanichkul and Supattarakul (2011)].

Our study contributes to the accounting literature by providing empirical evidence on the persistence of earnings and their cash flow and accrual components of emerging markets (i.e., Thai stock markets). Our results are beneficial to financial analysts and investors of Thai listed firms in that when they are predicting a firm's future earnings in an estimation of the firm's stock price, they should take into account the differential persistence of the cash flow and accrual components of current earnings. In addition, our results that stock prices do not accurately reflect information in the cash flow and accrual components of earnings with respect to one-year-ahead earnings suggest that Thai investors can possibly earn abnormal returns from the mispricing of these earnings components.

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