Effects of Earnings Management to Investor Decision –Empirical Evidence in Vietnam Stock Market

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Abstract: - Earnings result reflects business performance and hence earnings quality plays an important role in making investment decision of investors. However, little research has been done regarding the effects of earnings management on investor decision. In this study, we examine the effects of earnings management on investor decision and look for empirical evidences with a sample consisting of 2,980 firm-year observations from 669 companies listed on two main stock exchanges of Vietnam during the five-year period 2013-2017. This study conducts a multivariate linear regression, in which investor decision is the dependent variable and earnings management is one of the regressors. The random effect model, which is the most appropriate model in our study, reveals that the higher level of earnings management of a company, the more likely investors decide to own shares of that company, implying a warning sign for investors. Besides, investors prefer to own shares of companies with high ROE and low financial leverage, while investor's decision is not significantly affected by type of auditors, revenue growth or asset size of the companies. However, price factor is not examined in this study and could be an extension of future research.

Key-Words: - Earnings management, investor decision, modified Jones model.

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1 Introduction

Earnings play a key role in the business operation of an enterprise. Earnings reflect economic efficiency of current business strategies, help to assess comprehensively historical performances of the company and set a baseline for future targets. Besides, positive earnings increase firm value and thus increase wealth of shareholders, who are the owners of the firm. Not only managers and shareholders but also investors are more and more interested in earnings result of the company. P/E (i.e., Price to Earnings ratio) is an important ratio for investors to consider before making investment decision. However, the question is whether the current P/E is justified, or more specifically whether the reported earnings per share (EPS) used to calculate P/E is reliable. Therefore, earnings management becomes a matter of concern in the decision making of investors.

For years, various researches have spent effort to examine earnings management. Many researchers have built measures of earnings management, mainly classified into two categories: accruals earnings management [33] and real activities manipulation [22]. Those measures have been used in several studies of earnings management and earnings quality. Some studies have examined the determinants of earnings quality [26]. Some researchers focus on the effects of earnings management on excess return, investment efficiency [7], cost of capital [2] and market liquidity [6].

However, little research has been done regarding the impact of earnings management on investor decision, particularly the decision of investors to buy and sell stocks. The purpose of this study is to examine this relationship with empirical evidences from the Vietnam stock market. We expect that companies with low degree of earnings management will be attractive to investors, and investors are willing to buy, rather than sell, shares of those companies. In addition, this study also examines the effects of specific characteristics of companies (i.e., revenue growth, asset size, financial leverage, profitability, and type of auditors) on investor's decision, creating a basis for further researches.

On the basis of theoretical frameworks and previous researches regarding earnings management and investors decision, we build a research model and establish corresponding hypotheses. Sample data is derived from non-financial companies listed on two major stock exchanges of Vietnam (Hochiminh Stock Exchange - HOSE and Hanoi Stock Exchange - HNX) within the five-year period 2013-2017. Large and inclusive sample is expected to provide comprehensive insights regarding the investor decision and its determinants. Then, a multivariate linear regression is conducted to examine the relationship between investor decision and earnings management, as well as other specific characteristics of the companies.

2 Problem Formulation

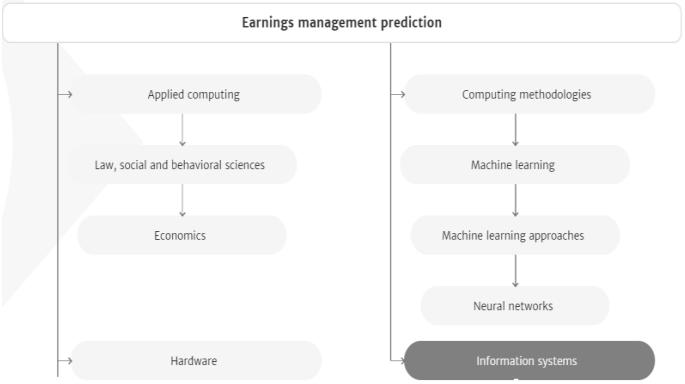
2.1. Literature review on measuring earnings management

The company's earnings consist of two components: cash flows and accruals [15]. Cash flows relate to cash actually earned in the accounting period, while accrued earnings reflects future cash flows expected to be earned. More specifically, accrued accounting basis recognizes revenues and corresponding expenses incurred in the accounting period when the company has performed economic activities, not on the basis of actual cash outflows or inflows. Hence, earnings management can be conducted through real activities manipulation and accruals management.

2.1.1. Real activities manipulation

Managers can take real transactions to affect cash flows in the current period and thus manipulate earnings. Examples include overproduction to reduce cost of goods sold (COGS), excessively cutting research and development (R&D) costs to boost earnings, manipulating the timing of asset sales to record profits, or aggressive trade discounts to increase sales volume [22].

Therefore, we can only figure out the correlation between these factors and earnings management. However, these factors have not been used directly to forecast the level of earnings management in advance (i.e. upward and downward earnings management). In order to decrease the financial crisis risks derived from earnings management and help the investors avoid suffering a great loss in the stock market, we developed a neural network model to predict the level of earnings management. By using the Taiwan Economic Journal (TEJ) dataset and 11 factors which affect earnings management studied in literature, the model provides the highest prediction rate of 81% in the cases of manipulating earnings upwards.



Researcher show that companies which normally have high R&D expenditures, such as pharmaceutical companies, are more likely to cut R&D costs just before the chief executive officer retires [15]. Result shows that companies choose time to liquidate fixed assets to smooth earnings over accounting periods and avoid negative earnings growth [5].

However, it is difficult to know whether a certain transaction is evidence of earnings management. In general, real transactions for the purpose of manipulating earnings do not violate most accounting standards as long as the company properly books the transactions. Those transactions only cause long-term damage to the company and to the interests of shareholders. For example, overproduction helps lower fixed cost per product unit, thereby reducing COGS in the period. This action does not violate any accounting standard but will reduce the quality of plant and equipment, causing impairment and replacement costs in the future and putting pressure on inventories in the next accounting period. Moreover, even if these real transactions are favorable in terms of earnings recognition, they cannot be considered as evidence of earnings management.

Previous studies measure the degree of real activities manipulation by the abnormal level of related transactions [22], which is the difference between the estimated normal level and the actual level of the related transactions.

Study derives real activities manipulation from normal levels of three components [11]:

(1) Cash flow from operating activities (CFO)

$$CFO_t / A_{t-1} = \alpha_0 + \alpha_1*(1/ A_{t-1}) + \beta_1*(S_t / A_{t-1}) + \beta_2*(\Delta S_t / A_{t-1}) + \varepsilon_t^{CFO}$$

(2) Production costs

$PROD_t / A_{t-1} = \alpha_0 + \alpha_1*(1/ A_{t-1}) + \beta_1*(S_t / A_{t-1}) + \beta_2*(\Delta S_t / A_{t-1}) + \beta_3*(\Delta S_{t-1} / A_{t-1}) + \varepsilon_t^{PROD}$ (2)

(3) Discretionary expenses

$DISEXP_t / A_{t-1} = \alpha_0 + \alpha_1*(1/ A_{t-1}) + \beta_1*(S_{t-1} / A_{t-1}) + \varepsilon_t^{DISEXP}$ (3)

where CFO: Cash flow from operating activities; PROD: COGS plus change in inventory; DISEXP: Discretionary expenses; S: Total revenue; A: Total assets; ε_t^{CFO}, ε_t^{PROD}, ε_t^{DISEXP}: abnormal levels (i.e., residuals), used as proxies for real transactions manipulation [11].

Study decomposes real activities manipulation into four components [22]:

(1) R&D cost

$RD_t / A_{t-1} = \alpha_0 + \alpha_1*(1/ A_{t-1}) + \beta_1*MV_t + \beta_2*Q_t + \beta_3*(INT_t / A_{t-1}) + \beta_4*(RD_{t-1} / A_{t-1}) + \varepsilon_t^{R\&D}$ (4)

(2) Selling, General and Administrative expenses (SG&A)

$SGA_t / A_{t-1} = \alpha_0 + \alpha_1*(1/ A_{t-1}) + \beta_1*MV_t + \beta_2*Q_t + \beta_3*(INT_t / A_{t-1}) + \beta_4*(\Delta S_t / A_{t-1}) + \beta_5*(\Delta S_t / A_{t-1})*DD + \varepsilon_t^{SG\&A}$ (5)

(3) Gain on asset sales

$GainA_t / A_{t-1} = \alpha_0 + \alpha_1*(1/ A_{t-1}) + \beta_1*MV_t + \beta_2*Q_t + \beta_3*(INT_t / A_{t-1}) + \beta_4*(ASales_t / A_{t-1}) + \beta_5*(ISales_t / A_{t-1}) + \varepsilon_t^{Asset}$ (6)

(4) Production cost

$PROD_t / A_{t-1} = \alpha_0 + \alpha_1*(1/ A_{t-1}) + \beta_1*MV_t + \beta_2*Q_t + \beta_3*(S_t / A_{t-1}) + \beta_4*(\Delta S_t / A_{t-1}) + \beta_5*(\Delta S_{t-1} / A_{t-1}) + \varepsilon_t^{Production}$ (7)

where RD: R&D cost; SGA: SG&A expenses; GainA: Gain on asset sales; PROD: COGS plus change in inventory; A: Total assets; MV: The natural logarithm of market value; Q: Tobin's Q; INT: Internal funds; S: Total revenue; DD: dummy variable, equal to 1 if total sales decrease between year t-1 and year t, and zero otherwise; ASales: Long-lived assets sales; ISales: Long-lived investment sales; $\varepsilon_t^{R\&D}$, $\varepsilon_t^{SG\&A}$, ε_t^{Asset}, $\varepsilon_t^{Production}$: abnormal levels as proxies for real transactions manipulation [22].

2.1.2. Accruals management

Earnings management can also be done via accruals management. Instead of using cash transactions to manipulate earnings, managers can produce a desired earnings by adjusting discretionary accruals. Study give some examples of discretionary accruals, including allowance for doubtful accounts, provision for devaluation of inventories, usage of different depreciation methods, costs capitalization of fixed assets, etc [15]. These accruals allow managers to make discretionary estimates and judgments, and thus creating opportunities for managers to manage accrued earnings.

Similar to the measurement of real transaction manipulation, measurement models of accruals management try to find the abnormal level of accrual accounts.

Research uses discretionary accrual (DA) as a proxy for earnings management. DA is the difference between total accrual (TA) in a year and non-discretionary accrual (NDA) [24]. Total accrual in year t is the difference between reported net income (NI) and the cash flows from operating activities (CFO) during year t. Non-discretionary accrual is the average of total accruals during the observed period, scaled by the total asset at the beginning of each year.

A result considers total accrual in the preceding year (TA_{t-1}) as the non-discretionary accrual [11]. Therefore, the discretionary accrual is the difference of total accruals between year t and year t-1. However, the DeAngelo (1) model has a shortcoming that it requires NDA to be constant over time and consequently DA to be zero on average. To overcome this limitation, these accruals (i.e., TA, DA, and NDA) are scaled by revenue of the preceding year to reflect business activities.

The standard-Jones model incorporates further business operating activities of the company when calculating the non-discretionary accrual. Instead of assuming a constant NDA, the standard-Jones model takes into account the change in revenue (ΔREV) and the gross value of property, plant and equipment (PPE) as factors affecting non-discretionary accruals [35]. The following model is conducted in the estimation period, during which the Jones model implicitly assumed that discretion is not exercised:

$TA_{i,t} / A_{i,t-1} = \alpha_1 [1/A_{i,t-1}] + \alpha_2 [\Delta REV_{i,t} / A_{i,t-1}] + \alpha_3 [PPE_{i,t} / A_{i,t-1}] + \varepsilon_{i,t}$

where TA: total accrual; ΔREV: change in net revenue; PPE: gross property, plant, and equipment; A: total assets.

The Ordinary Least Square (OLS) estimates α_1, α_2, α_3 are then applied to the observation period to get the normal (forecast) level of accruals (i.e., non-discretionary accrual $NDA_{i,t}$). The abnormal accrual

(i.e., discretionary accrual) is the difference between the total accrual in year t and the corresponding non-discretionary accrual. All accruals are scaled by the lagged total asset.

$$NDA_{i,t}/A_{i,t-1} = \alpha_1 [1/A_{i,t-1}] + \alpha_2 [\Delta REV_{i,t} / A_{i,t-1}] + \alpha_3 [PPE_{i,t}/A_{i,t-1}] \quad (8)$$

where TA: total accrual; ΔREV: change in net revenue; PPE: gross property, plant, and equipment; A: total assets.

Notably, the equation (8) is estimated separately for each company over the estimation period during which the standard-Jones model implicitly assumed no systematic earnings management. Meanwhile, non-discretionary accrual in the equation (9) is calculated over the observation period which differs and follows the estimation period. Therefore, the shortcoming of the Jones model related to the equation (8) is that it requires a long estimation period of at least 14 years [33] with no discretion exercised.

Dechow et al. (1995) modify the standard-Jones model by including change in receivables (ΔREC) in the right-hand side of the equation (9) with negative sign (–). While the original Jones model implicitly assumes that no discretion is exercised in both the estimation period and the observation period, the modified Jones model relaxes this assumption over the observation period. Change in revenue should exclude change in account receivables as earnings may be managed by exercising discretion over credit sales [33].

Instead of obtaining the estimated coefficients in the equation (8) over the estimation period and then applying them to the equation (9) over the observation period, researchers take an industry approach and directly estimates the equation (8) separately for each industry and year. This approach does not require a long estimation period and reflects better the business cycles [17].

Researcher compare different measurement models of earnings management and the results show that the modified Jones model was the best for detecting earnings management. In many studies, the accrual accounting approach explains earnings management better than the other approaches [19]. Therefore, we choose the modified Jones to measure earnings management [13].

2.2. Literature review on effects of earnings management on investor decision

Researcher examine the effects of financial reporting quality on investor decision in Nigeria. Ten manufacturing companies listed on the Nigerian Stock Exchange are chosen as the sample for this study [34]. Data is collected for the five-year period 2010-2014 . Study measure financial reporting quality by the accrual method proposed [16]. Trading volume is chosen as a proxy for investors' reaction to the quality of financial reports. The higher financial reporting quality, the larger trading volume of shares.

Short-sighted investors probably prefer relevance and timeliness qualities of financial reports in order to make timely decision to buy or sell stocks. Meanwhile, far-sighted investors prioritize reliability of financial information to accurately evaluate business operations when investing in a company. Nevertheless, whether an investor is a long-term or short-term investor, financial reporting quality influences the investor's decision to some extent.

Timeliness quality of financial information assists investors in making decisions to buy and sell stocks. The higher timeliness quality of earnings information, the more confidence of investors in forecasting the company's future cash flows. Besides, reliability quality helps investors find useful earnings information. If managers use their discretion to opportunistically manipulate earnings, earnings information will mislead investors and make them reluctant to make investment decision.

In those studies, stock return during a pre-determined period is used as a proxy of investment decision of investors. In other words, the studies focus on the relationship between earnings management and the result of the investment decision (ex post), not the investment decision per se at the beginning (ex ante).

To optimize portfolio, nonlinear mathematical models for some were specified and presented then using the change of variables technique that in operations research literature is a simple technique, two models could merged and integer linear model variables were created and the results were used to calculate the software Lingo.If Policy makers in this area are interested that in addition to considering cutting alpha, to have amounts parameters such as the total budget and each budget and also the annual output value, also have the optimum values, for this purpose, the following table represents sensitivity analysis to policymakers:

The amount in the budget							Variable
140	130	120	110	100	90	80	
21	18	16	15	12	11	5	V_α^u
8	7	7	6	5	2	2	V_α^l
142	125	112	103	85	85	62	R_α^u
134	109	95	91	78	46	17	R_α^l

Figure 1. Sensitivity analysis for total budget with alpha- 0.5

Research finds out that some characteristics of earnings quality, such as reliability and smoothness, appear to influence the investment

efficiency [27]. High earnings quality will help investors choose the efficient investments, while earnings management reduces earnings quality and thus affects investor's decision. Their study is conducted with 25 Tunisian listed companies for the period 1997-2013.

Instead of examining the result of investment decision or investment efficiency, some researchers focus on the effect of earnings management on excess return, on company's investment efficiency [7], on cost of capital [2] and on market liquidity [6].

In Vietnam, there are also many studies researching determinants of earnings management. Researcher studies factors that generally influence earnings management of listed companies in Vietnam. Van (2017) examines earnings management when Vietnamese listed companies issue additional shares. Research study the effects of board characteristics to earnings management [18]. Result finds out evidences that companies engage in earnings management whenever corporate income tax rate changes [25].

There are studies in Vietnam with earnings management being an independent variable. Nevertheless, we found no study in Vietnam examining the effects of earnings management on investor decision.

2.3. Theoretical frameworks

2.3.1. Agency theory

The agency theory stated that an agency problem may occur whenever there is conflict of interests between the agent and the principal [32]. According to the agreed contracts, the agent will act on behalf of the principal to perform predefined tasks. The agent is expected to maximize the principal's benefits. The agency theory, however, argues that the agent also has his/her own interests to pursue and the agent's interests may conflict with the principal's.

The relationship agent-principal in the agency theory translates to the manager-shareholder in a joint stock company. The shareholders, who are the owners of the company, delegate authority to the managers to manage the company on their behalf. The managers are expected to maximize the firm value, or wealth of the shareholders. Meanwhile, the shareholders monitor their firm's performance via financial statements provided by the managers.

The agency theory is one of the major theories that reasonably explain issues related to quality of financial statements, especially earnings quality and earnings management. These issues may incur during the preparation, auditing and disclosure of financial statements. Compensation based on earnings result and/or pressures from shareholders on short-term performance have urged the managers to engage in intentionally adjusting information on financial statements. The financial statements then become less reliable and less useful for their intended users. Outside investors may be misled when making investment decision based on manipulated information presented in those financial statements. Therefore, investors may consider financial reporting quality and earnings management first when making investment decision.

2.3.2. Signaling theory

Signaling theory states that asymmetric information between buyer and seller almost always exists and thus the buyer will make decision based on signals contained in actions of the seller. If the seller chooses to sell a superior-quality product at a price just at average level, the buyer may question the real reason behind this decision.

Due to asymmetric information, outside investors could not have more information than inside managers, and hence the investors (role of buyer) will observe all decisions made by the managers (role of seller) to collect insights about the company. A company voluntarily disclosing information with comprehensive details sends positive signal to the market [10]. If the financial information is presented with high quality and proved to be accurate, investors may feel more confident with their investment decision. In contrast, if it is revealed that the managers engage in earnings management to inflate reported profit, investors may imply that the company is struggling or is going to face difficulties in the near future. In this case, earnings management will send negative signal to the market and concern investors.

2.4. Hypothesis

Based on the theoretical framework and relevant literature reviews, we propose a research model as in the Figure 2. The main purpose of this study is to analyse the effects of earnings management to investor decision, and thus investor decision will take the role of the dependent variable while earnings management will be the independent variable that we are interested in. We also introduce 5 control variables in the research model, including Profitability, Financial leverage, Revenue growth, Asset size and Type of auditor.

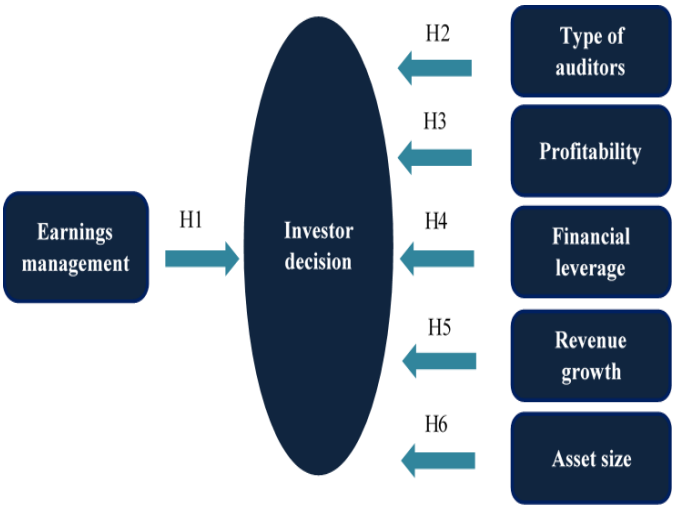


Figure 2. Research Model

Investors are generally reluctant to own shares of companies that are considered to have committed in earnings management. According to the agency theory, this concern mainly comes from the possible conflict of interests between managers and shareholders. Investors worry that managers may intentionally adjust earnings in a way that is beneficial to the managers' own personal interests and damages firm value, reducing wealth of shareholders. According to the signal theory, earnings management, when revealed, will send a negative signal to the market. Investors may imply that the managers want to manipulate reported earnings in order to hide the fact that the company is struggling or going to struggle shortly. Therefore, we expect that earnings management is negatively associated with investor's willingness to own shares.

H1: The higher level of earnings management the company engages, the less shares of that company investors decide to buy and the more to sell.

Empirical research of Vann and Presley (2018) reveals that Big4 auditors (i.e., Deloitte, Ernst & Young, KPMG, PwC) are more able to curb earnings management than non-Big4 auditors. Therefore, we expect that investors will have higher confidence to own shares of companies whose financial statements are audited by the Big4 auditors than companies whose financial statements are audited by the non-Big4 auditors.

H2: Investors decide to buy more, sell less shares of the company whose financial statements are audited by the Big4 auditors than company whose financial statements are audited by the non-Big4 auditors.

Decision of investors may be affected by the profitability of a company. After all, investors decide to invest in the company in order to achieve a certain level of return via dividend and capital gain. The more profitable the company is, the more its firm value will increase, and the more it will attract investors. We expect that profitability is positively associated with investor's willingness to own shares.

H3: The more profitable the company is, the more shares of that company investors decide to buy and the less to sell.

Financial leverage incorporates liquidity and solvency risks and hence discourages risk-averse investors. According to the Modern Portfolio Theory, investors tend to be risk averse (Markowitz, 1952). We expect that financial leverage is negatively associated with investor's willingness to own shares. Nevertheless, companies with high financial leverage have high required rate of return and may attract risk-seeking investors.

H4: The higher leverage the company has, the less shares of that company investors decide to buy and the more to sell.

Revenue growth and asset size of a company may influence investor decision and should be controlled for. Revenue growth may reveal the potential of core business, and companies with great potential may be attractive to investors. Besides, big companies are subject to intense scrutiny and attract attention of various stakeholders (e.g., unions, employees, customers, competitors), and thus investors may feel more confident to own shares of those big companies.

H5: The higher revenue growth the company has, the more shares of that company investors decide to buy and the less to sell.

H6: The bigger the company is, the more shares of that company investors decide to buy and the less to sell.

2.5 Methodology

2.5.1. Regression model

We conduct a multivariate linear regression analysis to examine the relationship between investor decision and earnings management, as well as other factors affecting investor decision. Specifically, the following regression model is estimated:

$$INVDE_{i,t} = \beta_0 + \beta_1 EM_{i,t} + \beta_2 AUDIT_{i,t} + \beta_3 ROE_{i,t} + \beta_4 LEV_{i,t} + \beta_5 GRO_{i,t} + \beta_6 SIZE_{i,t} + \varepsilon_{i,t}$$

where INVDE: investor decision to buy or sell stock; EM: earnings management; ROE: return on equity; AUDIT: type of auditor; GRO: annual revenue growth; LEV: financial leverage; SIZE: asset size.

2.5.2. Variable measurements

We use natural logarithm of the ratio between annual volumes of buy and sell orders as a proxy for investor's decision (INVDE). The aggregate size of buy/sell trading orders placed on a specific stock in a given year reveals investors' decision over that stock. Study suggest measuring the investor's decision by

the total trading volume of matched orders [34]. However, we expect this matched volume represents only liquidity of the market rather than investor decision and thus not suitable. Instead, it is reasonable to assume that trading volumes of buy or sell orders, when placed, reflect the final decision of investors, whether the orders are later matched or not. Nevertheless, we exclude put-through orders. Due to the variance among stocks regarding the number of shares outstanding, we use the ratio (i.e., relative value), instead of the difference (i.e., absolute value), between buy and sell volume. We then normalize the ratio by taking natural logarithm to get the INVDE variable. INVDE is *positive* when the ratio between buy and sell volume is *higher than* 1.0, or equivalently investors place *larger* "buy" orders than "sell".

Magnitude of discretionary accruals, which are derived using the modified Jones model [13], is used as a proxy for earnings management (EM). Discretionary accruals are the residual $\varepsilon_{i,t}$ from the estimation model (Lai, 2011):

$$TA_{i,t}/A_{i,t-1} = \alpha_1 [1/A_{i,t-1}] + \alpha_2 [(\Delta REV_{i,t} - \Delta REC_{i,t})/A_{i,t-1}] + \alpha_3 [PPE_{i,t}/A_{i,t-1}] + \varepsilon_{i,t} \quad (1)$$

where TA: total accrual, measured as the difference between net income and cash flows from operating activities; ΔREV: change in net revenue; ΔREC: change in account receivables; PPE: gross property, plant, and equipment; A: total assets.

All variables are scaled by the preceding year total assets A_{t-1} to control for heteroscedasticity (Lai, 2011). Following the industry approach, the model is estimated cross-sectionally by industry and year to get the residuals [17].

Firm is considered to have engaged in earnings management (i.e., increasing or decreasing earnings by discretion) if it has non-zero discretionary accruals. Earnings management is then the absolute value of these discretionary accruals ($|\varepsilon_{i,t}|$).

AUDIT is a dummy variable that equals to one if the company's financial statements are audited by one of the Big4 auditors in Vietnam (i.e., Deloitte, Ernst & Young, KPMG, PwC), and zero otherwise. We expect the coefficient of the AUDIT variable to be positive. We use return on equity (ROE) as a proxy for profitability, calculated as the ratio between net profit of the company in a year and the average total equity during that year. We expect ROE will be positively correlated with INVDE. Financial leverage (LEV) is the ratio between debts (short-term and long-term) and total assets. We predict that LEV will be negatively correlated with INVDE. Net revenue growth (GRO) is measured as the ratio of net revenues between year t and year t-1. We expect a positive coefficient of the GRO variable. Asset size (SIZE) of a company is calculated as the natural logarithm of total assets. We expect SIZE will be positively correlated with INVDE.

2.5.3. Sample selection and data collection

The sample consists of non-financial companies listed on two main stock exchanges of Vietnam: Hochiminh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX). To avoid survivorship bias, the sample includes all listed companies in the period 2013-2017 even if they were subsequently delisted. The sample excludes all banks, insurance and securities companies due to their unique structures of financial statements. In addition, as some variables of the regression models require data of the preceding year (e.g., GRO, ΔREC, etc.), the sample excludes observations that have no data of the preceding year.

Financial and trading data are collected mostly from Vietstock (vietstock.vn), a financial information provider. Type of auditors for the companies in the sample is derived from the CafeF's website (cafef.vn) and the companies' audited financial statements. Industry classification is based on Vietstock's list of industries with additional aggregation, resulting in 8 industries, including (1) Food & Beverage, (2) Energy, (3) Transportation, (4) Information and Communications Technology (ICT), (5) Commerce, (6) Manufacturing, (7) Materials and (8) Real Estate & Construction.

The final dataset consists of 2,980 firm-year observations from 669 companies listed on the HOSE and HNX over the five-year period from 2013 to 2017. The sample is unbalanced panel data due to the initial public offering and mandatory delisting of some companies during the observed period.

2.5.4. Regression methods

As the sample is unbalanced panel data, we estimate the regression model (10) using three methods: Pooled OLS, Fixed effect model (FEM) and Random effect model (RAM). The test, Lagrange multiplier (LM) test and F-statistic test are conducted to choose the most appropriate method [23].

In the Pooled OLS model, all cross-sectional and time-series effects are not taken into account. The estimated coefficients are assumed to be constant. The relationship between investor decision and other independent variables remains the same among firms and is constant over years.

The Fixed effect model takes into account the cross-sectional and/or period effects. Those effects are modelled using corresponding dummy variables. With the period effect, the intercept of the regression model would be allowed to vary over time but assumed to be the same across firms at each given point of time [21]. Similarly, with the cross-sectional effect, although the

intercept may differ across firms, each firm's intercept does not vary over time. A shortcoming of the FEM method is the large number of dummy variables added to the model, which significantly decrease the degrees of freedom.

In the Random effect model, a.k.a. Error Components Model, there is only one common intercept when estimating the regression model. Specific characteristics among companies are reflected in the error terms. Each composite error term consists of two components: the cross-sectional error component of each firm and the firm-year error component [4]. We use the Feasible Generalized Least Squares (FGLS) method to estimate REM [21]. In addition, the FGLS method also deals with heteroscedasticity caused by unbalanced panel data [21]. A critical assumption of REM is that the cross-sectional error component must not be correlated with other independent variables in the regression model, which can be tested by the Hausman test [23]. Another assumption of REM is the absence of cross-sectional dependence of residuals (Wooldridge, 2002, pp.257-260).

In order to decide which method is the most appropriate, the Hausman test, the Lagrange multiplier (LM) test and the F-statistic test are conducted. The null hypothesis in the F-statistic test is that fixed effects are redundant, or all coefficients of fixed effect dummy variables are jointly zero. If the null is rejected, FEM is more appropriate than Pooled OLS. The LM test [8] has the null hypothesis of zero variances across entities, or no significant difference across units. REM is chosen if the null is rejected, and Pooled OLS otherwise. Test checks the assumption that cross-sectional error components are not correlated with the regressors (null hypothesis) [23]. FEM is preferred if the null is rejected [4].

3 Problem Solution

4.1. Descriptive statistics

Table 1 shows descriptive statistics of the variables used in the regression model (10) for the full sample of 2,980 firm-year observations. INVDE has a negative mean of -0.135, indicating that on aggregate investors decided to sell more than to buy shares of the observed firms during the period 2013-2017. The mean of absolute discretionary accruals is 10% of total assets at the beginning of the year. Average return on equity of the companies in the sample is 11%, meanwhile their revenues increase by 8.5% each year. The mean leverage was 48.9% with a minimum of 0.2% and a maximum of 97.1%. The SIZE variable has a mean of 13.317, equivalent to an average asset size of VND 607 billion. There are 724 out of 2,980 observations (24.3%) having financial statements audited by the Big4 auditors.

Table 1. Descriptive statistics of variables in the sample

	INVDE	EM	ROE	GRO	LEV	SIZE
Mean	-0.135	0.100	0.110	1.085	0.489	13.317
Median	-0.066	0.066	0.103	0.073	0.510	13.231
Maximum	7.124	2.084	1.509	2035.963	0.971	19.181
Minimum	-6.142	0.000	-2.533	-1.039	0.002	9.515
Std. Dev.	0.631	0.118	0.165	37.672	0.225	1.509

Table 2 shows the number of listed companies in the sample by industry over the observed years.

Table 2. Descriptive statistics of variables

	HOSE	HNX	Total	2013	2014	2015	2016	2017
Commerce	156	133	**289**	47	50	58	63	71
Energy	125	68	**193**	37	37	38	40	41
Food & Beverage	180	100	**280**	49	51	58	59	63
ICT	32	159	**191**	37	37	38	39	40
Manufacturing	286	241	**527**	90	95	109	112	121
Materials	132	259	**391**	74	75	78	81	83
Real Estate & Construction	380	509	**889**	166	171	175	183	194
Transport	115	105	**220**	38	40	45	46	51
Total	1406	1574	**2980**	538	556	599	623	664

Table 3 further reports descriptive statistics by sectors. ICT is the only industry that investors decide to buy more than to sell during the period 2013-2017, with a positive INVDE mean of 0.08. Investors preferred to sell shares of food and beverage companies the most, with the lowest INVDE mean of -0.244. Among industries, the energy sector has the lowest EM mean of 6.6%. Meanwhile, mean of absolute discretionary accruals of the commerce sector is the largest at 13.9%. ROE of transportation companies has the highest mean of 15.9%, whereas real estate & construction sector has the lowest ROE mean of 7.5%. Manufacturing is the industry with the lowest revenue growth, at 10.9% on average. Real estate & construction is also the industry using the highest financial leverage of 58.9%, on average, whereas transportation has the lowest leverage with an average of 33.0%. Energy companies have the largest asset size, averaging at 13.8.

Table 3. Descriptive statistics by industries

	# firms	Obs.	INVDE	EM	ROE	AUDIT	GRO	LEV	SIZE
Commerce	71	289	-0.185	0.139	0.106	0.187	0.253	0.514	13.377
Energy	41	193	-0.029	0.066	0.153	0.394	0.137	0.460	13.815
Food & Beverage	67	280	-0.244	0.104	0.109	0.382	0.138	0.461	13.686
ICT	40	191	0.080	0.092	0.113	0.147	0.270	0.363	11.619
Manufacturing	121	527	-0.160	0.088	0.141	0.190	0.109	0.442	13.240
Materials	84	391	-0.201	0.099	0.099	0.210	0.229	0.495	13.344
Real Estate & Construction	194	889	-0.098	0.106	0.075	0.252	3.081	0.589	13.546
Transport	51	220	-0.181	0.084	0.159	0.241	0.713	0.330	13.011

4.2. Regression results

Table 4 presents correlations among our main variables. There is a positive correlation between INVDE and EM, suggesting that investors tend to buy more, sell less shares of firms with high earnings management. This contradicts with our expectation that firm engaging in earnings management is not a good investment and should be bought less, sold more.

Table 4. Correlation matrix

	INVDE	EM	AUDIT	ROE	LEV	GRO	SIZE
INVDE	1.000						
EM	0.016	1.000					
AUDIT	0.024	-0.084	1.000				
ROE	0.055	-0.002	0.052	1.000			
LEV	-0.032	-0.039	0.043	-0.096	1.000		
GRO	0.000	0.014	-0.011	-0.074	0.012	1.000	
SIZE	0.040	-0.088	0.464	0.086	0.331	-0.003	1.000

A possible explanation for such result is the information asymmetry, which almost always exists. Assumed that managers have no incentive to harm their personal interests, a high level of earnings management will be likely to result in positive earnings. Investors, however, may not know that earnings of the company have been managed or manipulated, and thus they will tend to consider the company a good stock to buy rather than sell. Even if the investors know that the earnings are managed, there is disagreement among investors on the possible future outcomes, which translates into more buy than sell of shares as the sellers may have more information than the buyers [6]. Our correlation result is consistent with the result of study that investors tend to buy shares of companies which have high earnings management [34].

Signs of correlations between INVDE and other regressors are in line with our expectation. Investors prefer to own big companies (SIZE) having good profitability (ROE), low leverage (LEV), positive revenue growth (GRO) and having financial statements audited by the Big4 auditors (AUDIT). As all correlation coefficients among variables are at low level and much less than 0.8, we found no threat of multicollinearity.

The estimated results of the regression model (10) using the Pooled OLS, FEM, REM approaches are presented in Table 5, 6, 7. The Pooled OLS and FEM estimations have $F_{Pooled\ OLS} = 3.22$ and $F_{FEM} = 3.32$, both statistically significant at the 1% level. The REM estimation has $F_{REM} = 2.77$, statistically significant at the 5% level.

Table 5. Regression result using Pooled OLS method

Dependent Variable: INVDE
Method: Panel Least Squares
Sample: 2013 2017
Periods included: 5
Cross-sections included: 669
Total panel (unbalanced) observations: 2980

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.396017	0.114586	-3.456062	0.0006
EM	0.101637	0.098725	1.029490	0.3033
ROE	0.179171	0.070859	2.528564	0.0115
AUDIT	0.000556	0.030696	0.018121	0.9855
GRO	5.93E-05	0.000307	0.193008	0.8470
LEV	-0.125000	0.055345	-2.258564	0.0240
SIZE	0.021946	0.009292	2.361939	0.0182

R-squared	0.006466	Mean dependent var	-0.134907
Adjusted R-squared	0.004460	S.D. dependent var	0.631462
S.E. of regression	0.630052	Akaike info criterion	1.916318
Sum squared resid	1180.179	Schwarz criterion	1.930411
Log likelihood	-2848.314	Hannan-Quinn criter.	1.921389
F-statistic	3.224540	Durbin-Watson stat	1.105380
Prob(F-statistic)	0.003690		

Table 6. Regression result using FEM with cross-sectional and period fixed effects

Dependent Variable: INVDE
Method: Panel Least Squares
Sample: 2013 2017
Periods included: 5
Cross-sections included: 669
Total panel (unbalanced) observations: 2980

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.388068	0.523182	-0.741746	0.4583
EM	0.217563	0.099224	2.192647	0.0284
ROE	0.198017	0.080271	2.466853	0.0137
AUDIT	-0.087247	0.070652	-1.234888	0.2170
GRO	8.25E-05	0.000279	0.295944	0.7673
LEV	-0.162759	0.141437	-1.150746	0.2500
SIZE	0.023311	0.041158	0.566378	0.5712

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.494798	Mean dependent var	-0.134907
Adjusted R-squared	0.345937	S.D. dependent var	0.631462
S.E. of regression	0.510690	Akaike info criterion	1.691015
Sum squared resid	600.1095	Schwarz criterion	3.058056
Log likelihood	-1840.613	Hannan-Quinn criter.	2.182904
F-statistic	3.323909	Durbin-Watson stat	2.149214
Prob(F-statistic)	0.000000		

Table 7. Regression result using REM with cross-sectional random effects

Dependent Variable: INVDE
Method: Panel EGLS (Cross-section random effects)
Sample: 2013 2017
Periods included: 5
Cross-sections included: 669
Total panel (unbalanced) observations: 2980
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.369997	0.158704	-2.331369	0.0198
EM	0.159755	0.091257	1.750611	0.0801
ROE	0.195773	0.070479	2.777751	0.0055
AUDIT	-0.014877	0.039907	-0.372797	0.7093
GRO	4.83E-05	0.000271	0.178503	0.8583
LEV	-0.124873	0.073513	-1.698642	0.0895
SIZE	0.019786	0.012813	1.544245	0.1226

Effects Specification

	S.D.	Rho
Cross-section random	0.365273	0.3356
Idiosyncratic random	0.513924	0.6644

Weighted Statistics

Table 8. Result of F-statistic test

Redundant Fixed Effects Tests
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.273584	(668,2301)	0.0000
Cross-section Chi-square	1990.665332	668	0.0000
Period F	8.323273	(4,2301)	0.0000
Period Chi-square	42.808566	4	0.0000
Cross-Section/Period F	3.309765	(672,2301)	0.0000
Cross-Section/Period Chi-square	2015.402569	672	0.0000

The results of the tests to choose the most appropriate model are conducted. The F-statistic test rejects the null hypothesis that fixed effects are redundant and concludes that FEM is more appropriate than the Pooled OLS. The LM tests using different methods [8] all reject the null hypothesis that there is no random effect and hence REM is better than the Pooled OLS. Therefore, either FEM or REM is more appropriate than the pure Pooled OLS. The test fails to reject the null hypothesis that the assumption of REM is violated [23].

In summary, after conducting the F-statistic test, LM tests and Hausman test, the REM is the most preferred model among three approaches.

Table 9. Summary of appropriation tests for the regression model

	F-statistic test	**LM tests**	**Hausman test**
Compare	Pooled OLS and FEM	Pooled OLS and REM	FEM and REM
Result	F(672, 2301)= 3.3098; p_value = 0.0000	p_value = 0.0000 under Breusch-Pagan, Honda, King-Wu, GHM	Chi-Sq. Statistic (6)= 10.8578; p_value = 0.0929
Null hypothesis	Reject H_0	Reject H_0	Failed to reject H_0
Conclusion	**Choose FEM**	**Choose REM**	**Choose REM**

Specific assumptions of REM model are not violated. The test result shows no sign of statistically significant correlation between cross-sectional error component and other independent variables in the regression model [23]. As the sample collected is highly unbalanced panel, the cross-sectional dependence test of residuals is invalid and also unnecessary when the number of cross-sections is large (i.e., 669 companies) and the time period is short (i.e., 5 years) [28].

Table 7 shows that the coefficient of the EM variable is positive and statistically significant at the level of 10%. The regression result confirms the conclusion from our previous correlation analysis: investors tend to buy more, sell less shares of firms with high earnings management. Besides, ROE has positive and statistically significant coefficient at the level of 1%. It makes sense that the higher profitability of the company, the more of its shares investors want to own. LEV has negative and statistically significant coefficient at the level of 10%, indicating that investors prefer to own shares of companies with low financial leverage. Other regressors AUDIT, GRO and SIZE do not have statistically significant impact on INVDE, or investor's decision is not significantly affected by type of auditors, revenue growth or asset size of the company.

6 Conclusion and Policy suggestion

Earnings management is important to investors in evaluating an entity's financial health and deciding to invest in that company. Several studies have been done to examine factors affecting earnings management and to establish measures of earnings management. However, little attention has been given to the impact of earnings management on investor's decision. Therefore, this study sets itself the goal to investigate the effect of earnings management on decision of investors regarding equity investments in Vietnam stock market.

We utilize the modified Jones model to calculate discretionary accruals, which are used as a measure of earnings management [35]. We use the natural logarithm of the ratio between annual trading volumes of buy and sell orders of a company's shares as a proxy for investor's decision. Then, we conduct a regression analysis with investor's decision as the dependent variable and the absolute value of discretionary accruals as the main regressor. Control variables are added to the model, including revenue growth, asset size, financial leverage, profitability and type of auditors of the companies. As the sample is unbalanced panel data, we run the regression model with three methods (i.e., FEM, REM, and Pooled OLS), and choose the REM as the most appropriate model.

The empirical study reveals that earnings management has a positive and statistically significant correlation with investor's decision to own shares (i.e., investors tend to buy more, sell less shares of firms with high earnings management). This contradicts with our expectation that firm engaging in earnings management is not a good investment and should be bought less, sold more. Besides, investors tend to buy more, sell less shares of companies having good profitability and low financial leverage, whereas asset size, revenue growth and whether auditor is the Big4 do not affect investor decision.

Information asymmetry is one possible explanation for the ironic result. The investors may not realize that the seem-to-be-great reported earnings are actually managed. Due to information asymmetry, they do not know the actual, nondiscretionary earnings, and consequently they may be attracted by good reported results and will buy more shares of the company. On the other hand, the sellers (i.e., existing shareholders) may have more information about the actual business performance of the company, which is probably lower than market expectation. Therefore, the sellers may be willing to sell shares at a lower price than the market, attracting a huge number of buyers. Even if the investors are aware of earnings management, there is disagreement among them on the degree of earnings management, which leads to more buying and less selling of shares as the sellers may have more information than the buyers.

Nevertheless, shortcomings of this study are inevitable due to the limited resources. First of all, the main limitation comes from other independent variables which could also have affect investor's decision. Regressors in this study include earnings management and only five characteristics of the companies (i.e., asset size, revenue growth, financial leverage, profitability, type of auditor). Further research may include more independent variables to capture other relevant characteristics of the companies. Another limitation involves the proxy for investor decision. A closer look at trading volume would be noteworthy to better understand the investor's decision (e.g., change in trading volume surrounding earnings announcement; put-through orders; number of orders). It is worth noting that prices of orders were not taken into account in this study and could be an extension of future research. Finally, the sample data in this study was collected for the period 2013-2017. Further researches may consider the latest data or a longer time frame.

To conclude, the effects of earnings management to investor decision have been studied,

the empirical evidence of Vietnam stock market reveals a positive and statistically significant correlation between them, and thus the main purpose of the current research has been achieved.

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