

Ceo's Overconfidence and Firm Performance of Listed Companies in Vietnam

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Abstract:

Introduction: In this study, the author uses data from listed companies on the Ho Chi Minh City and Hanoi Stock Exchanges from 2012 to 2022 to examine the impact of CEOs' overconfidence on firm performance measured through ROA

Objectives: The author uses four measures of CEO overconfidence behavior including: excess cash flow, excess earnings, revenue management, and cost management. From there, the author aims to evaluate the impact of overconfidence behavior on firm performance.

Methods: To conduct a cross-sectional regression study to measure CEO overconfidence behavior, and then use panel data regression to assess the impact of overconfidence on performance

Results: The results show that CEO's overconfidence behavior caused by excess cash flow or excess earnings will increase performance, while CEO's overconfidence behavior caused by revenue and cost control will decrease performance. Overconfidence combined with ownership form will have an impact on efficiency, but the interaction effect with stock market growth is unclear.

Conclusions: From the results, the author also proposes recommendations on how to control the overconfidence behavior of CEOs to avoid risks arising, helping to stabilize and increase business performance.

Keywords: CEO overconfidence; firm performance and listed companies in Vietnam

1. Introduction

Research on the efficiency and operational risk of enterprises has so far been approached from the perspective of traditional finance. According to the traditional financial economics school, individuals participating in the market are all "perfect" people, meaning that they always make rational decisions, are able to process any available information in the market and have a reasonable trade-off between risk and profit based on the trade-off theory (John Y. Campbell and Luis M. Viceira, 2005). While behavioral finance researchers argue that humans are not always rational, research in this new direction has found many biases and limitations in human cognition and many conclusions show that the assumptions of rational finance are no longer valid, one of which is the heuristics theory of (Kahneman and Tversky, 1974), in which the problem of overconfidence emerges (Ritter, 2003). The authors were the first to propose measures of CEO overconfidence behavior, and studied the impact of CEO overconfidence on firm cash flow and risk. These latter measures have been used by many studies, especially the Netbuyer measure (Malmendier and Tate, 2005a,b, 2008; Pham Quoc Viet and Nguyen Dinh Trung, 2018; Nguyen et al., 2020). The development of this topic has now expanded in many

directions, many other ways of measurement such as measurement through income, through the amount of press news but these measures are generally limited, while the nature leading to the overconfident behavior of CEOs originating from surplus cash flow or income is rarely mentioned. In addition, there have been some recent studies that suggest that earnings management behavior (including revenue and cost management) is also a sign of CEOs' overconfidence behavior. Our study differs from previous studies in measuring CEOs' overconfidence behavior, in which the author relies on the intrinsic nature that causes CEOs' overconfidence behavior, which is from surplus cash flow and income, and the author also considers earnings management behavior as another measure representing CEOs' overconfidence behavior affecting business performance. Our new contribution is to examine the interaction between overconfidence measures with ownership form, income diversity and stock market growth on corporate performance.

2. Literature reviews

Mueller and Brettel (2012) used a sample of German CEOs over a 10-year period to examine CEO overconfidence (also based on the methodology of Malmendier and Tate, 2005) to see how it affects firm performance. Mueller and Brettel's findings suggest that CEO overconfidence has a detrimental effect on firm performance during economic downturns. However, recent authors show that CEO overconfidence has a positive impact on profitability and stock price performance in the early stages of a firm (Mueller and Brettel, 2012; Bilicka, 2020; Chen et al., 2016; Vitanova, 2018). But There are also results showing negative effects of CEO overconfidence on organizational performance, such as those related to investment decisions (Malmendier and Tate, 2005), financing decisions (Gervais et al. 2011), or strategic decisions (Hayward and Hambrick, 1997).

In Vietnam, there have been some authors recently researching this topic, however, the authors almost also use old measures according to previous authors, especially the measure according to Malmendier and Tate (2005). Specifically, recent typical studies such as the study by Pham Quoc Viet and Nguyen Dinh Trung (2018) on the overconfidence of managers on the capital structure of non-financial enterprises listed in the period from 2010 - 2016 on the Ho Chi Minh City Stock Exchange. Truong Dinh Bao Long (2018) examined the impact of managers' overconfidence behavior on financial decision making for Vietnamese enterprises, including investment decisions, financing decisions and dividend payment decisions. Tran Minh Lam (2021) studied the characteristics of overconfidence, CEO compensation and performance of listed companies on the Vietnamese stock market. The results also showed that CEO overconfidence has a significant positive impact on business performance measured by Tobin'Q and ROA.

3. Methods

The author uses four measures of CEO overconfidence. To do this, the author regresses industry-specific and year-specific models to estimate the Over variable. For the first method, the author uses the expected operating cash flow model (Finger, 1994; Dechow et al., 1998; El-Sayed Ebaid, 2011; Finger, 1994; Benjamin Noury et al., 2020) according to the following model:

$$OCF_{it} = a_0 + a_1OCF_{it-1} + a_2AR_{it-1} + a_3AP_{it-1} + a_4INV_{it-1} + a_5DEP_{it-1} + a_6Other_{it-1} + e_{lit} \quad (1)$$

Where:

OCF_{it} is the operating cash flow in year t of company i (Operating cash flow: $OCF = (EBIT + Depreciation - Tax)$)

OCF_{it-1} is the operating cash flow in year $t-1$ of company i

AR_{it-1} is the change in receivables for year $t-1$ and $t-1$ of company i

AP_{it-1} is the change in payables for year $t-1$ and $t-1$ of company i

INV_{it-1} is the change in inventories for year $t-1$ and $t-1$ of company i

DEP_{it-1} is the depreciation for year $t-1$ of company i

$Other_{it-1}$ represents the accrual for year $t-1$ of company i , calculated as follows:

$Other = E - (OCF + AR + INV - AP - DEP)$ (E =Earning)

The author uses model (1) of cross-sectional regression for each year, classified by industry group according to the standard (GICS) to find CEOs in companies with overconfidence behavior occurring when the residual (e) of the model >0 is assigned the value $=1$, companies with residual <0 will be assigned the value $=0$ (ie there is no phenomenon of CEO overconfidence). With this measurement, in this research, it is called the variable **Over1**

For the second measure to calculate overconfidence behavior, instead of relying only on the difference between the announced plan number and the actual EPS achieved, the author applies the regression model through the origin (RTO) according to Adelman and Watkins (1994) and Hocking (1996). The proposed model is as follows:

4. $EPS_{it} = \overline{EPS}_{it} + e_{2it}$ (2)

The author uses regression according to equation (2) above, CEOs in companies with overconfidence behavior occur when and only when the residual (e_2) of the model >0 , assigned the value $= 1$, companies with residual <0 are assigned the value $= 0$. The author uses cross-sectional data to process for each year, classified by industry group. This helps to effectively evaluate both models of CEO overconfidence behavior when CEOs have cash flow or EPS expectations exceeding the average of the whole industry. This measure is very consistent with the concept of overconfidence of (Malmendier, U., & Tate. G, 2005a; Larwood and Whittaker, 1977; Svenson, 1981; Alicke, 1985) when it is assumed that the overconfidence behavior of CEOs when they predict the results to be greater than the average or the "better-than-average" effect (Malmendier, U., & Tate. G, 2005a). This measure, in this article, is called the **Over2** variable.

In addition, Cohen et al. (2008) or Tien-Shih Hsieh et al. (2014) argue that overconfident CEOs will try to manage earnings upward. To manage earnings upward, companies with overconfident CEOs will tend to increase cash flow from operations and reduce production costs more than companies with less confident CEOs

First, the author calculates the normal cash flow from operations by assuming that normal OCF is a linear function of revenue and changes in revenue, as follows:

$$\frac{OCF_{it}}{ASSETS_{it-1}} = k_1 \frac{1}{ASSETS_{it-1}} + k_2 \frac{SALES_{it}}{ASSETS_{it-1}} + k_3 \frac{\Delta SALES_{it}}{ASSETS_{it-1}} + \varepsilon_{3it} \quad (3)$$

In which: OCF = cash flow from operating; Asset = Total assets; Sales = Revenue

Abnormal cash flow from operations (R-OCF) = Actual OCF minus Normal OCF based on the estimated result from equation (3). In case of abnormal cash flow >0, it is coded = 1 (overconfidence exists) and otherwise =0 (no overconfidence of the CEO). R-OCF is used to measure the actual management of the company's activities related to accelerating the sales period through increasing price discounts or credit terms to be more favorable than usual. By this measure, the variable is called **Over3**

In addition, assuming that the cost of production and business includes the total cost of goods sold, administrative costs, selling costs and other costs, the estimate of the normal cost of production and business in equation (4) is as follows:

$$\frac{PROD_{it}}{ASSETS_{it-1}} = l_1 \frac{1}{ASSETS_{it-1}} + l_2 \frac{SALES_{it}}{ASSETS_{it-1}} + l_3 \frac{\Delta SALES_{it}}{ASSETS_{it-1}} + l_4 \frac{\Delta SALES_{it-1}}{ASSETS_{it-1}} + \varepsilon_{4it} \quad (4)$$

Abnormal production costs (R-PROD) are actual production costs minus normal production costs as estimated from equation (4). Companies with abnormal production costs <0 are coded = 1 (overconfidence exists), otherwise assigned = 0 (overconfidence does not occur). Based on the actual OCF operating cash flow and the usual estimate, the business production cost, we can calculate the abnormal cash flow from operations (R-OCF), abnormal production cost (R-PROD) as a proxy for the actual management activities. By this measure, in this research called the **Over4** variable

In models (1), (2), (3) and (4), the author uses cross-sectional data for each year, divided by industry group. This helps to effectively evaluate both models of CEO overconfidence behavior when CEOs have cash flow or income expectations that exceed the average of the whole industry.

Model for assessing the impact of overconfidence on business performance

Model 1:

$$\text{Performance}_{it} = \beta_0 + \beta_1 \text{Over1}_{it} + \beta_2 \text{FO}_{it} + \beta_3 \text{SO}_{it} + \beta_4 \text{D-income}_{it} + \beta_5 \text{Stock-growth}_{it} + \beta_6 \text{CEO-Ownership}_{it} + \beta_7 \text{Size}_{it} + \beta_8 \text{Age}_{it} + \beta_9 \text{Growth}_{it} + \beta_{10} \text{Lev}_{it} + \beta_{11} \text{Liq}_{it} + \beta_{12} (\text{Over1} * \text{FO})_{it} + \beta_{13} (\text{Over1} * \text{SO})_{it} + \beta_{14} (\text{Over1} * \text{D-income})_{it} + \beta_{15} (\text{Over1} * \text{Stock-growth})_{it} + \beta_j \sum_{j=1}^7 \text{Indus}_j + u_{it} \quad (1)$$

Model 2:

$$\text{Performance}_{it} = \beta_0 + \beta_1 \text{Over2}_{it} + \beta_2 \text{FO}_{it} + \beta_3 \text{SO}_{it} + \beta_4 \text{D-income}_{it} + \beta_5 \text{Stock-growth}_{it} + \beta_6 \text{CEO-Ownership}_{it} + \beta_7 \text{Size}_{it} + \beta_8 \text{Age}_{it} + \beta_9 \text{Growth}_{it} + \beta_{10} \text{Lev}_{it} + \beta_{11} \text{Liq}_{it} + \beta_{12} (\text{Over2} * \text{FO})_{it} + \beta_{13} (\text{Over2} * \text{SO})_{it} + \beta_{14} (\text{Over2} * \text{D-income})_{it} + \beta_{15} (\text{Over2} * \text{Stock-growth})_{it} + \beta_j \sum_{j=1}^7 \text{Indus}_j + u_{it} \quad (2)$$

Model 3:

$$\text{Performance}_{it} = \beta_0 + \beta_1 \text{Over3}_{it} + \beta_2 \text{FO}_{it} + \beta_3 \text{SO}_{it} + \beta_4 \text{D-income}_{it} + \beta_5 \text{Stock-growth}_{it} + \beta_6 \text{CEO-Ownership}_{it} + \beta_7 \text{Size}_{it} + \beta_8 \text{Age}_{it} + \beta_9 \text{Growth}_{it} + \beta_{10} \text{Lev}_{it} + \beta_{11} \text{Liq}_{it} + \beta_{12} (\text{Over3} * \text{FO})_{it} + \beta_{13} (\text{Over3} * \text{SO})_{it} + \beta_{14} (\text{Over3} * \text{D-income})_{it} + \beta_{15} (\text{Over3} * \text{Stock-growth})_{it} + \beta_j \sum_{j=1}^7 \text{Indus}_j + u_{it} \quad (3)$$

Model 4:

$$\text{Performance}_{it} = \beta_0 + \beta_1 \text{Over4}_{it} + \beta_2 \text{FO}_{it} + \beta_3 \text{SO}_{it} + \beta_4 \text{D-income}_{it} + \beta_5 \text{Stock-growth}_{it} + \beta_6 \text{CEO-Ownership}_{it} + \beta_7 \text{Size}_{it} + \beta_8 \text{Age}_{it} + \beta_9 \text{Growth}_{it} + \beta_{10} \text{Lev}_{it} + \beta_{11} \text{Liq}_{it} + \beta_{12} (\text{Over4} * \text{FO})_{it} + \beta_{13} (\text{Over4} * \text{SO})_{it} + \beta_{14} (\text{Over4} * \text{D-income})_{it} + \beta_{15} (\text{Over4} * \text{Stock-growth})_{it} + \beta_j \sum_{j=1}^7 \text{Indus}_j + u_{it} \quad (4)$$

Performance variable is used in the model, the author uses the performance measure according to the ROA index. Regarding industry classification: In the research sample, the industry is divided based on

the industry classification standard of GICS (built by MSCI and S&P Dow Jones Indexes). In this study, the author excludes the financial industry group, accordingly the remaining industry groups in the research sample include: (1) IT: information technology industry group (standard industry), (2) CN: industrial production, (3) YD: medical, pharmaceutical, (4) HHDV: consumer goods and services, (5) NVL: production of materials, (6) CN: industrial production, (7) TT: information and communication. Details of the variables and their calculations are detailed in Table 1 below

Table 1. Summary of variable descriptions and calculations

Interpretation	Variable	Measure variables
Dependent variable		
Return on total assets	ROA	(Profit after tax)/(Beginning period assets + Ending period assets)/2
Dependent variables		
+ CEO Overconfidence	Over1	Measured by operating cash flow surplus, from model (1)
+ CEO Overconfidence	Over2	Measured by the difference over the industry average EPS, from model (2)
+ CEO Overconfidence	Over3	Measured by excess abnormal operating cash flow, from model (3)
+ CEO Overconfidence	Over4	Measured by abnormal business production costs, from model (4)
Moderating variable		
+ The interaction between CEO confidence and foreign ownership	Over1*FO	Measured by the interaction variable between Over1 and foreign ownership. Examine the role of foreign ownership in CEO overconfidence behavior.
+ The interaction between CEO confidence and state ownership	Over1*SO	Measured by the interaction variable between Over1 and state ownership. Examine the role of state ownership in CEO overconfidence behavior.
+ The interaction between CEO confidence and income diversification	Over1*D-income	Measured by the interaction variable between Over1 and diversification. Examine the role of corporate income diversification on CEO overconfidence behavior.
+ The interaction between CEO confidence and foreign ownership	Over2*FO	Measured by the interaction variable between Over2 and foreign ownership. Examine the role of foreign ownership in CEO overconfidence behavior.
+ The interaction between CEO confidence and state ownership	Over2*SO	Measured by the interaction variable between Over2 and state ownership. Examine the role of state ownership in CEO overconfidence behavior.

+ The interaction between CEO confidence and income diversification	Over2*D-income	Measured by the interaction variable between Over2 and diversification. Examine the role of corporate income diversification on CEO overconfidence behavior.
+ The interaction between CEO confidence and foreign ownership	Over3*FO	Measured by the interaction variable between Over3 and foreign ownership. Examine the role of foreign ownership in CEO overconfidence behavior
+ The interaction between CEO confidence and state ownership	Over3*SO	Measured by the interaction variable between Over3 and state ownership. Examine the role of state ownership in CEO overconfidence behavior
+ The interaction between CEO confidence and income diversification	Over3*D-income	Measured by the interaction variable between Over3 and diversification. Examine the role of corporate income diversification on CEO overconfidence behavior.
+ The interaction between CEO confidence and foreign ownership	Over4*FO	Measured by the interaction variable between Over4 and foreign ownership. Examine the role of foreign ownership in CEO overconfidence behavior.
+ The interaction between CEO confidence and state ownership	Over4*SO	Measured by the interaction variable between Over4 and state ownership. Examine the role of state ownership in CEO overconfidence behavior.
+ The interaction between CEO confidence and income diversification	Over4*D-income	Measured by the interaction variable between Over4 and diversification. Examine the role of corporate income diversification on CEO overconfidence behavior.
+ The interaction between CEO confidence and stock market growth index	Over1*Stock-growth	Measured by the interaction variable between Over1 and stock growth. Examine the role of stock growth on CEO overconfidence behavior.
+ The interaction between CEO confidence and stock market growth index	Over2*Stock-growth	Measured by the interaction variable between Over2 and stock growth. Examine the role of stock growth in CEO overconfidence behavior.
+ The interaction between CEO confidence and stock market growth index	Over3*Stock-growth	Measured by the interaction variable between Over3 and stock growth. Examine the role of stock growth in CEO overconfidence behavior.
+ The interaction between CEO confidence and stock market growth index	Over4*Stock-growth	Measured by the interaction variable between Over4 and stock growth. Examine the role of stock growth on CEO overconfidence behavior.
Control variables		
+ CEO ownership	CEO-Ownership	Measured by percentage of shares owned by the CEO

+ Diversify income	D-Income	$HHI = (NON/NETOP)^2 + (NET/NETOP)^2$, NON is main income, NET is other income and NETOP is net income, $NETOP = NON + NET$, income diversity level is calculated by $DINC = 1 - HHI$ (value from 0-0.5)
+ Stock market growth	Stock-growth	$(\text{Stock index year } t - \text{Stock index year } t-1) / \text{Stock index year } t-1$
+ Foreign ownership	FO	Number of foreign investors owning shares / Total shares
+ State ownership	SO	Number of state-owned shares/Total shares
+ Size	Size	Natural logarithm of total assets
+ Age	Age	Number of years in operation as of the calculation year
+ Growth	Growth	$(\text{Year } t \text{ revenue minus year } t-1 \text{ revenue}) / \text{Year } t-1 \text{ revenue}$
+ Leverage	Lev	Total Debt/ Total Assets
+ Liquidity	Liq	Current Assets / Current Liabilities

Source: Compiled from the author

The data used in the study is in the form of balanced panel data, the author selected a sample of enterprises listed on the Ho Chi Minh City Stock Exchange and the Hanoi Stock Exchange. The data source is based on the database provided by Fiinpro (www.Fiinpro.com) and Refinitiv Eikon (formerly Thomson Reuters). Enterprise data is collected from audited financial statements or annual reports published by enterprises over the years. Data is collected annually, calculated from financial statements, annual reports, ownership reports and mandatory reports published in the period from 2012-2022.

5. Results

Table 2. Descriptive results of variables

Variable	Obs	Medium	Standard deviation	Min	Max
ROA	5.554	0,0589	0,0791	-0,6245	0,8391
SO	5.554	0,2258	0,2520	0,0000	0,9927
FO	5.554	0,0988	0,1386	0,0000	0,9493
D-income	5.554	0,0902	0,1394	0,0000	0,4999
Stockgrowth	5.554	0,1086	0,2148	-0,3324	0,4781
CEO-Owner	5.554	1,6678	4,7383	0,0000	56,4800
Size	5.554	27,3888	1,5979	23,3300	33,9895
Age	5.554	9,2600	3,9700	5,0000	23,0000
Growth	5.554	0,3143	4,2667	-1,0000	244,4550
Lev	5.554	0,4757	0,2221	0,0006	1,3757

Liq	5.554	2,6573	4,6637	0,0338	146,9157
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Source: Author's calculation

Table 2 shows the results of descriptive analysis of variables (excluding variables with binary values 0 and 1). The variables showing efficiency include ROA with an average value of 5.89%. Regarding ownership structure, the average results show that state ownership accounts for 22.58%, while foreign ownership has a still low average value of 9.88%, despite the regulation allowing an increase in the foreign investor ownership ratio (Decree 60/2015/ND-CP on allowing an increase in the foreign investor ownership ratio). The level of income diversification calculated by DINC index = 1-HHI has a value from 0-0.5 (0.5 is high income diversification), with an average value of 0.09, meaning a low level of income diversification. Although diversification is a risk reduction strategy, this result also creates limitations when businesses generally focus on traditional business segments and income arising from pure business segments. The stock index growth rate during the period had an average value of 10.86%, while the falling period caused the index to drop by -33.24%. The strong fluctuations in the stock index also caused instability in policies and financial situations for businesses.

Regarding ownership ratio, the average value of CEO's stock holding is 1.67%, there are enterprises where CEO does not hold (0%), the highest percentage of CEO holding is 56.48% belonging to major shareholders with controlling power. The variables of size, age, revenue growth, leverage and liquidity have average values of 27.38; 9.26; 31.43%; 0.47 and 2.65 respectively. The deviation value and the difference between the smallest and largest values are also high. This phenomenon needs to be overcome in the quantitative results.

Table 3. Quantitative results of the effect of overconfidence on efficiency-ROA

Biến	Model1	Model2	Model3	Model4
	Coefficient	Coefficient	Coefficient	Coefficient
Over1	0,0124 (*)			
Over2		0,0426(*)		
Over3			-0,0308(*)	
Over4				-0,0679(*)
SO	0,0429 (*)	0,0398(*)	0,0044	-0,0288(*)
Over1*SO	-0,0091			
Over2*SO		0,0037		
Over3*SO			0,0505(*)	
Over4*SO				0,0768(*)
FO	0,0519 (*)	0,0405(*)	0,0055	0,0492(*)
Over1*FO	0,0166			
Over2*FO		0,0006		
Over3*FO			0,0752(*)	
Over4*FO				-0,0076
D-Income	-0,0053	-0,0078	-0,0243(**)	-0,0157
Over1*D-income	-0,0037			
Over2*D-income		0,0017		

Over3*D-income			0,0257(***)	
Over4*D-income				0,0099
Stockgrowth	0,0014	0,0157(*)	0,0007	-0,0083
Over1*Stockgrowth	0,0072			
Over2*Stockgrowth		-0,0176(***)		
Over3*Stockgrowth			0,0078	
Over4*Stockgrowth				0,0206(**)
CEO-Owner	0,0001 (*)	0,0007(*)	0,0007(*)	0,0009(*)
Size	0,006(*)	0,005(*)	0,0063(*)	0,0064(*)
Age	-0,0011(*)	-0,0009(*)	-0,0011(*)	-0,0013(*)
Growth	0,001(***)	0,0006	0,0008(***)	0,0008(**)
Lev	-0,1407(*)	-0,1473(*)	-0,1409(*)	-0,1216(*)
Liq	-0,0003	-0,0002	-0,0003	-0,0002
BDS	-0,019(*)	-0,0176(*)	-0,0174(**)	-0,0165(**)
CN	0,0040	0,0038	0,0064	0,013(**)
YD	0,0122	0,0100	0,0114	0,0118
HHDV	0,0138 (**)	0,0113(***)	0,0144(**)	0,0209(*)
NVL	0,0068	0,0072	0,0106(***)	0,0169(*)
TT	0,0123 (***)	0,0063	0,0121	0,0198(*)
Const	-0,0497 (**)	-0,0377(***)	-0,0368(***)	-0,0231

Source: Author's calculation (*); (**); (***) correspond to significance levels of 1%; 5% and 10%

First, CEO overconfidence behavior in terms of cash flow and earnings (Over1 and Over2) both have a statistically significant positive impact on performance. Because cash flow from operations is considered sustainable and is related to firm valuation, similar to the case of earnings per share (EPS) (Kyeongmin Jeon et al., 2019). Therefore, the case of CEO overconfidence but the actions and business strategies bring the value of surplus operating cash flow and increased profits leading to increased EPS creates a positive signal in business valuation both on the book and market aspects, and thus creates a positive impact on efficiency. This result is also consistent with the research results of (Malmendier and Tate, 2005; Yang and Kim, 2020; Tran Minh Lam, 2021). However, if CEO overconfidence caused by earnings management behavior measured by (Over3 and Over4) has a negative impact on performance. Obviously, when listed companies are public enterprises, controlled by many stakeholders, requiring information transparency and other related reports. Therefore, confident behavior to create biased values outside of normal regulations or standards is easily recognized and creates a negative effect on performance (Schrand & Zechman, 2012; Ahmed & Duellman, 2013; Hsieh et al., 2014). State ownership in the relationship of overconfidence caused by surplus operating cash flow and surplus income has a positive effect on efficiency. Enterprises with state ownership have a positive impact on the performance of enterprises due to the “helping hand” and “monitoring role” of the government (Ang and Ding, 2006; Tan et al., 2015; Boubakri et al., 2018). However, if overconfidence leads to earnings and earnings management, it still has a negative impact on performance. This may occur because governments may direct firms to operate for social or political

goals other than profit goals, which leads to a negative impact on firm performance (Boycko et al., 1996; Bennedsen, 2000).

Except for the interaction between overconfidence behavior due to excess cash flow and state ownership, which has a negative impact ($Over1*SO$) on efficiency, other interaction effects of state ownership all have positive results, meaning that state ownership partly controls CEO overconfidence behavior, reduces inefficient behaviors, thereby increasing efficiency for enterprises. Foreign ownership variables all have positive impacts on performance, except for the case where the CEO has overconfidence due to cash flow and revenue management (model 3). This result also shows that for listed companies, when a lot of information needs to be transparent, the manager's unusual behaviors will also be recognized and have a negative impact on the value of the company, this result is similar to the case of interaction effects ($Over4*FO$). The results showing the interaction effect of foreign ownership on Over variables also show that the moderating role increases efficiency. The reason why foreign ownership has a positive impact on efficiency is because of the contribution of foreign investors in many aspects such as management experience, investment experience, etc., thereby helping to improve business efficiency for enterprises (Nguyen Anh Phong and Ngo Phu Thanh, 2017; Kao et al., 2019; Quynh Nga Duong, 2021).

Income diversification variable exists inversely correlated with efficiency. This result also supports the research results of (Stiroh, 2004; Lepetit et al., 2008). The increase in debt and equity not only depends on the internal factors of the enterprise such as cash flow, industry, ... but it also depends on many other macro factors such as government credit policy, government tax policy, import-export regulations, ... or is also strongly affected by good/bad information domestically and internationally. Under the regulation of macro influences or systemic risks, real value and real cash flow from business diversification or income diversification cannot resolve the instability or good signals from the market.

The stock index growth variable has a positive and statistically significant effect on market efficiency and book efficiency. When the market grows, it shows a good economic situation, good prospects for business and industry development, investors expect higher growth and business valuation, so it has a positive effect on efficiency, especially market efficiency (Jie Cao, 2010; Nam Hoai Tran and Le Dat Chi, 2017). However, the interaction variable $Over2*Stockgrowth$ has a (-) effect on book performance and is statistically significant. This result shows that in the condition of stock growth, over-expectation from CEOs' high confidence in earnings also has a negative effect on performance. Because in this situation, over-confident CEOs are able to "polish" earnings (EPS) to pursue market price increases while forgetting the real intrinsic values of the business. CEO ownership has a positive impact on efficiency. In addition, when the CEO owns shares of the company, he or she will be more rational and responsible in making decisions because if the company has problems, he or she will be the one to suffer. In addition, the decision-making owner will help to reduce the agency cost problem (Jensen & Meckling, 1976; Lin and Fu, 2017) thereby increasing efficiency.

The age variable has a negative impact on book value (ROA). Firm age often affects performance, operating efficiency, possibly through mediating mechanisms such as habits, experience, and accumulated reputation. Most studies suggest that older firms have more stable capital structures as well as more resources and social experience, so they can spend more time and resources on R&D activities, thereby improving their competitiveness and value (Guo & Zhang, 2017; Cuong Vu Hung,

2021). However, there are also studies that suggest that large, long-standing companies are prone to inertia and slow innovation, easily losing many business opportunities and thereby affecting business results negatively. In this study, the results support the negative impact (Phung and Hoang, 2013; Kao et al., 2019). The revenue growth variable has a positive and statistically significant effect on book performance. High revenue growth is an indication of a company's past business success and can be used as a tool to predict its future growth (Deitiana, 2011). Revenue growth shows the trend of businesses expanding their business, expanding their markets and customers, or the state of the business industry in the growth stage. This helps the company develop production and business activities, accumulate reinvestment capital and increase business efficiency (Evita & Christina, 2019; Le Thi Kim et al., 2021). Financial leverage has a negative impact on book performance, if viewed from the book perspective when a business uses high financial leverage, uses a lot of debt, financial pressure increases, higher interest expenses come with higher debt levels, thereby reducing the business's income, thereby having a negative impact on book performance (Ping & Hsien, 2009; Lin & Fu, 2017; Yuli Soesetio et al., 2023).

Although liquidity has a negative correlation with efficiency, it is not statistically significant. Firms that want to operate smoothly need to maintain liquidity, the higher the liquidity, the lower the risk of financial distress. However, there is a contradiction between liquidity and profitability, a company with high liquidity will create low profitability. High liquidity causes a lot of capital to flow into current assets, this capital cannot be rotated to generate income, so the company's income will be at risk of decreasing because the company loses the opportunity to use capital. These arguments indicate an inverse relationship between liquidity and profitability as well as its efficiency (Hossain, 2020), Nguyen and Nguyen, 2020; Bambang Sudiyatno and Titiek Suwart, 2022).

Regarding the impact of industry on efficiency, the results show that real estate enterprises are less efficient than the standard industry (IT) and even other industries (statistically significant). In addition, the results also show that enterprises operating in the pharmaceutical, medical; industrial production; consumer goods and services sectors are more efficient than the remaining industries. This result is also consistent with previous studies by (Zbigniew Matyjas, 2014; Nguyen Trong Nghia, 2021).

6. Conclusion and recommendation

The effect of CEO overconfidence behavior on performance with the results from four measures of overconfidence shows consistent results: overconfidence measured by excess operating cash flow or excess earnings per share (EPS) both have positive effects on performance, while overconfidence measured by earnings management behaviors caused by cash flow management through revenue or management of abnormal expense flows both have negative effects. These results imply that overconfidence resulting from operating cash flow or excess earnings is a concerning sign for investors because excess operating cash flow or earnings per share above the industry average shows the positive efforts of the CEO. However, for CEOs, overconfidence causes earnings management behavior, creating overconfidence that creates unreal value for the business by changing the way revenue and expenses are recorded that is not true to nature and reality, thereby reducing efficiency. Regarding the moderating role of state ownership and foreign ownership on CEO overconfidence and performance, the results show that the majority (statistically significant) of the moderating roles of state and foreign ownership have positive effects on performance, except for the case of CEO overconfidence due to

earnings management. Thus, state or foreign ownership plays a moderating role in increasing performance. Increasing state or foreign ownership helps control overconfidence and increases performance, except for the case of CEOs in firms with earnings management tendencies.

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