Influence of Investment Efficiency by Managers and Accounting Conservatism on Idiosyncratic Risks to Investors

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ABSTRACT

This paper examines whether the investment efficiency of managers and accounting conservatism affect the idiosyncratic risks to investors. The empirical findings suggest the following. Firstly, overinvestment (underinvestment) by managers increases (decreases) idiosyncratic risks to investors. Secondly, accounting conservatism enhances information quality and lowers the idiosyncratic risks. Finally, accounting conservatism mitigates the investment inefficiency by manager and affects the idiosyncratic risks to investors, meaning it mitigates manager's overinvestment and lowers the idiosyncratic risks to investors. In the case of underinvestment, accounting conservatism improves manager's motivation for investment, and thus, the idiosyncratic risks to investors.

JEL classification numbers: G32, M41, D81

Keywords: Idiosyncratic risk, Investment efficiency, Over-investment, Under-investment, Accounting conservatism.

1. INTRODUCTION

This paper examines the influence of manager's investment efficiency and accounting conservatism on idiosyncratic risks to investors, which is an issue worthy of attention for the following reasons. First, the agency theory contends that managers do not work for the best interest of investors; rather, managers seek to maximize their own personal wealth [1], and this may result in inefficient investment decisions, meaning either overinvestment or underinvestment. Literatures also suggest that managers make risk decisions for the benefit of their own wealth utility [2-3]. Such investment decisions,

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often described as idiosyncratic risks, may increase the firm's operating risks and financial risks. Studies indicate that the higher the idiosyncratic risks, the greater the volatility of share prices and the higher the risks to investors [4-6]. Sub-optimal investment decisions by managers are likely to affect the idiosyncratic risks assumed of investors. Therefore, this paper believes it is necessary to include manager's investment efficiency in the examination of idiosyncratic risks to investors.

Previous theories and empirical studies focused on the enhancement of financial reporting quality, in order to improve the manager's lack of investment efficiency [7-12], while very little academic research has been conducted on the influence of manager's inefficient investment on idiosyncratic risks to investors. In order to fill the gap of research relevant to investment efficiency, this paper starts by exploring the effects of manager's investment efficiency on idiosyncratic risks to investors. This is the first research topic.

The improvement of financial reporting quality can counter investment inefficiency [8]. This is why recent studies posit that accounting conservatism boosts information quality and improves manager's inefficient investments [11-13].

Accounting conservatism is an important corrective practice in the preparation of financial reports, as it takes a cautious approach to earnings recognition. In case of bad news, loss incurred will be reported early. In the event of good news, profits will be recognized later [14]. In other words, accounting conservatism mitigates the information asymmetry between managers and investors and reduces the agency problem [15-16]. Therefore, this paper includes accounting conservatism in the research model in its examination of how manager's investment efficiency affects the idiosyncratic risks to investors. This is the second research topic.

The research objectives of this paper are to examine whether manager's investment efficiency affects the idiosyncratic risks assumed of investors, whether accounting conservatism affects idiosyncratic risks to investors, and finally, whether accounting conservatism mitigates manager's overinvestment (underinvestment) and reduces (enhance) idiosyncratic risks for investors.

This paper samples the firms listed on the Taiwan Stock Exchange from Taiwan Economic Journal's database. The research period is 2006-2016 and the number of observations is 10,038 firm-years data. The empirical results are in line with the prediction: (1) There is significant correlation between manager's overinvestment and investors' idiosyncratic risks. Manager's overinvestment causes a significant increase in idiosyncratic risks to investors. (2) Manager's underinvestment discourages the willingness of investors to capital. (3) Accounting conservatism enhances the firm's information quality and significantly reduces the idiosyncratic risks assumed of investors. (4) Accounting conservatism improves investment efficiency and lowers idiosyncratic risks. Finally, manager's underinvestment prompts manager's willingness to step up investment.

Sensitivity analysis suggests: (1) It is difficult for accounting conservatism to mitigate manager's overinvestment if there is too much capital available. (2) If managers are only restricted by debt covenants, accounting conservatism can effectively mitigate manager's overinvestment and its influence on idiosyncratic risks to investors. (3) In the presence of oversight from both shareholders and creditors, accounting conservatism cannot mitigate manager's overinvestment.

This paper makes the following contributions. The exploration of the relationship of manager's investment efficiency and accounting conservatism with idiosyncratic risks to investors helps investors to understand the effect of manager's investment efficiency on idiosyncratic risks. The research findings provide insight to investment efficiency. Last, but not least, this paper supports that accounting conservatism improves manager's investment inefficiency [11,13,17], and mitigates agency problems for investors.

This paper is organized, as follows. Chapter 1 provides an introduction of the research motivations and objectives. Chapter 2 conducts literature review on how manager's investment efficiency and accounting conservatism affect idiosyncratic risks to investors. Chapter 3 explains the research methodology, empirical model construction, and variable definitions. Chapter 4 presents the empirical findings and analysis. Chapter 5 summarizes the conclusions.

2. LITERATURE REVIEW

2.1 Idiosyncratic Risks to Investors

Risks are one of the key considerations for investors, as risks tie the interest to investors. In theory and in practice, risks are divided into systematic risks and idiosyncratic risks. As a firm's investment decisions are made by managers, the idiosyncratic risks assumed of investors are subject to the effect of investment decisions. Moreover, investors can only diversify idiosyncratic risks in the market, not systematic risks; therefore, idiosyncratic risks are particularly important to investors. Literatures suggest significant and positive correlation between idiosyncratic risks and returns volatility [4-6,18-19]. If manager's decisions increase firm-specific risks, investors assume higher returns volatility and greater idiosyncratic risks. In summary, idiosyncratic risks to investors and investment decisions by managers are correlated.

Early studies confirm a positive correlation between stock price returns and manager's compensations [3,20]. The use of equity-based compensations can align the interest of managers and investors, and thus, mitigate agency problems [1]. As mentioned in previous studies, (1) if manager's wealth function is convex, their optimal investment decision is to increase risky investment and achieve performance targets with higher earnings, in this instance, investors will assume the greater idiosyncratic risks due to the greater firm-specific risks; (2) If manager's wealth function is concave, the optimal investment decision is to reduce risky investments to improve expected benefits, which the lowers firm-specific risks, and hence, idiosyncratic risks [2]. In summary, manager's investment decisions affect the idiosyncratic risks to investors.

2.2 Investment Efficiency and Idiosyncratic Risks

The agency theory argues that managers seek to maximize their personal wealth, not investors [1]. The pursuit of personal interest by managers may result in sub-optimal decisions. Hence, it is suggested to improve financial reporting quality [7-8,11], audit quality [21-22], and disclosure quality [10,23-24], in order to mitigate the inefficient investment decisions by managers. Inefficient investments can be largely classified into overinvestment or underinvestment. Overinvestment is defined as projects with negative NPVs (net present values) or projects with positive NPVs, but high risks [8]. Given the information asymmetry, the moral hazard model suggests that managers are incentivized to overinvest in negative-NPV projects. The adverse selection model contends that managers have more information than investors; therefore, managers will attempt to overissue overpriced securities (or shares). A successful offering will lead to overinvestment decisions [25-26]. The availability of ample capital or free cash flows allows managers to pursue overinvestment in low-return projects [27]. Manager's decision to maximize their personal interests is likely to result in empire building [23]. Literatures show that manager's overconfidence may cause more overinvestments or value-destroying acquisitions [28-29]. Earnings managers are likely to lead to overinvestment decisions [30]. Therefore, this paper expects that manager's overinvestment decisions will increase firm-specific risks and idiosyncratic risks to investors.

Underinvestment is defined as manager's forgoing of positive-NPV investment opportunities [8]. Regarding the reason for underinvestment, managers may issue stock at a price higher than investors' expectations, which may discourage stock subscriptions, and thus, cause underinvestment by managers [25]. Studies have found that risk-averse managers may seek to reduce firm-specific risks by avoiding investments, and underinvestment is likely to create agency problems between managers and investors [31-32]. As positive-NPV projects help to improve the firm's financials, investors may hope that managers step up risky investments in a timely manner. Managers may cut back on investments to gloss over the firm's lack of debt-servicing capability [11]. Therefore, this paper expects that underinvestment reduces firm-specific risks, and thus, idiosyncratic risks to investors.

The above literatures suggest that, given the information asymmetry, managers ignore the potential risks of investments when they pursue performing targets. Manager's overinvestment boosts firm-specific risks and increases the idiosyncratic risks assumed of investors. In contrast, manager's underinvestment reduces the idiosyncratic risks to investors. Hence, this paper develops the first hypothesis, as follows:

H1a: There is positive correlation between manager's overinvestment and idiosyncratic risks to investors.

H1b: There is negative correlation between manager's underinvestment and idiosyncratic risks to investors.

2.3 Accounting Conservatism

Accounting aims to provide reliable information for users to understand the financial status and operating results of firms. Accounting information represented with financial reporting is relevant to stakeholders, such as investors, creditors, and government agencies. Therefore, how to correctly convey accounting information to users is a long-standing issue in accounting theories. In other words, it is necessary to ensure that financial reports can allow users to establish a full understanding of the contents delivered in accounting information. The American Institute of Certified Public Accountants (*AICPA)* defines accounting as an activity of service in nature, which is primarily for the purpose of providing quantitative information of economic entities to users, in order to empower users to make informed decisions for relevant action plans.

In the accounting theory, the principle inferred by a set of reasonable assumptions in the preparation of financial reporting is called accounting conservatism.

In practice, many accounting standards are related to the principle of accounting conservatism, and this principle has direct effect on earnings recognition in financial reporting. Accounting conservatism demands immediate recognition of losses (bad news) and delayed reporting of profits (good news); therefore, the timing of earnings recognition is asymmetric [14]. Meanwhile, accounting conservatism ensures robust reporting of earnings information to users [14-16] and effective mitigation of agency costs for shareholders [33-35]. The greater the focus on corporate governance, the heavier the emphasis on conservatism [36]. Accounting conservatism makes up the insufficiency of corporate governance [37]. In brief, accounting conservatism mitigates information asymmetry. Literatures suggest that enhanced financial reporting quality reduces the behavior of private information gathering by investors and lowers the level of idiosyncratic risks [38-39]. Based on the above, this paper develops the second hypothesis:

H2: There is negative correlation between accounting conservatism and idiosyncratic risks.

2.4 Accounting Conservatism and Investment Efficiency

According to early studies, if managers are able to identify problems in advance, it helps to prevent inefficient decisions [15, 40-41]. The research during recent years suggest that the enhancement of accounting conservatism prevents managers from engaging in risky projects [42-44]. The immediate recognition of losses mitigates risky acquisitions decided by managers [17,45-46]. Greater accounting conservatism improves future performances [47]. Accounting conservatism helps to moderate manager's inefficient investment [11]. The empirical results suggest that, at the time of manager's overinvestment, accounting conservatism prompts managers to drop negative-NPV projects. In the case of manager's underinvestment, accounting conservatism enhances the quality of financial reporting and helps stakeholders in the oversight of managers, thus, supervisory pressure urges managers to actively seek positive-NPV projects.

Recent studies suggested that accounting conservatism reduces overinvestment, as resulted by overconfidence [13]. Accounting conservatism can improve manager's investment efficiency in the labor market by moderating over-hiring (overinvestment) and under-hiring (underinvestment) [12]. In other words, when managers are overinvesting, accounting conservatism makes them give up risky projects, and hence, reduces the idiosyncratic risks to investors. If managers are underinvesting, accounting conservatism urges them to seek investment opportunities, which optimally increases idiosyncratic risks to investors. Based on the abovementioned, this paper develops H3:

H3a: Accounting conservatism mitigates overinvestment and reduces idiosyncratic risks to investors.

H3b: Accounting conservatism mitigates underinvestment and increase idiosyncratic risks to investors.

3. RESEARCH METHOD

3.1 Empirical model

This paper constructs the following models in the examination of the relation between manager's investment efficiency and idiosyncratic risks to investors, as well as the influence of the level of accounting conservatism on idiosyncratic risks assumed of investors. The empirical research is conducted by validating hypotheses:

Eq. (1) the relationship between manager's investment efficiency and idiosyncratic risks to investors (H1);

Eq. (2) the influence of the level of accounting conservatism on idiosyncratic risks assumed of investors (H2);

Eq. (3) whether accounting conservatism improves manager's investment efficiency by incorporating the interaction effect of manager's investment efficiency and accounting conservatism (H3).

The empirical models are, as follows:

$$IR_{it} = \beta_1 + \beta_2 INEFF_{it} + \beta_3 ROA_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \varepsilon_{it} \quad (1)$$

$$IR_{it} = \beta_1 + \beta_2 COM_{it} + \beta_3 ROA_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \varepsilon_{it} \quad (2)$$

$$IR_{it} = \beta_1 + \beta_2 INEFF_{it} + \beta_3 COM_{it} + \beta_4 INEFF_{it} \times COM_{\mathrm{it}} + \beta_5 ROA_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \varepsilon_{it} \quad (3)$$

The key explained variable in this paper is IR_{it}, i.e. idiosyncratic risks for Firm i during year t. The explanatory variables are $INEFF_{it}$, manager's investment inefficiency for Firm *i* during year t; COM_{it} the level of accounting conservatism for Firm *i* during year t. The control variables are ROA_{it}, return on assets of Firm i during year t, calculated with post-tax earnings deflected with total assets during the year t; $SIZE_{it}$ the firm size of Firm *i* during year t, the natural logarithm of total assets; $LEV_{it}$the financial leverage of Firm *i* during year t, defined as the debt ratio.

3.2 Measurement of idiosyncratic risks

This paper refers to Fama-French's capital asset pricing model (CAPM) for the estimate of idiosyncratic risks (IR_{it}) $assumed$ of investors in the agency market. The capital asset pricing model was developed on the basis of the works [50, 51], which was extended into a three-factor model [19], and then, a five-factor model [50]. This paper measures idiosyncratic risks with the standard deviation of residuals in the single-factor model, the three-factor model, and the five-factor model for assets pricing, and takes the idiosyncratic risks (IR_{it}) as the dependent variable in the empirical model. First, a single factor that influences the stock market is estimated with the weighted average market return less the risk-free rate $\left(R_{Mt} - R_{ft}\right)$ in the single-factor asset pricing mode. The estimation method in the single-factor asset pricing model is expressed as Eq. (4):

$$R_{itm} - R_{ft} = \alpha_1 + \beta_1\left(R_{Mt} - R_{ft}\right) + \theta_{itm} \qquad (4)$$

where R_{itm} denotes the return of Firm i*'*s stocks during month m and year t*;* R_{ft} is the risk-free rate for year *t;* R_{Mt} is the weighted average market returns for year *t;* θ_{itm} is the residual term of Eq. (4). This paper uses Eq. (4) to estimate the standard deviation of the single factor θ_{itm} as the first proxy variable for idiosyncratic risks (IR_ONE).

The asset pricing model cannot completely explain stock returns [19], and hence, sought improvements by adding the two factors of firm size (SMB) and book-to-market ratios (HML) to the model. Firm size (SMB_t) is estimated with the investment portfolio of small caps less that of large caps. The book-to-market ratio (HML_t) is estimated with the stock portfolio of high book-to-market ratios minus that of low book-to-market ratios. Eq. (4) is the three-factor model (including firm size $SMB_t$and book-to-market ratios HML_t), which is frequently used nowadays for the measurement of stock market returns.

Eq. (5) is estimated, as follows:

$$R_{itm} - R_{ft} = \alpha_1 + \beta_1(R_{Mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \varphi_{itm} \tag{5}$$

where SMB_t denotes the size effects during year t, HML_t denotes the book-to-price ratio during year t; φ_{itm} is the standard deviation of the residual term, and IR_THR is the second proxy variable for idiosyncratic risks.

Ref [50] made further improvement on their capital asset pricing model, as developed in 1993, by adding two market factors in the capital asset pricing model. Profitability (RMW_t) and investment (CMA_t) are the fourth and the fifth factors, respectively. According to [50], the profitability factor (RMW_t) is the difference between the portfolio of companies with high profitability and the portfolio of companies with weak profitability. The investment factor (CMA_t) is the difference between the portfolio of companies with high investments and the portfolio of companies with low investments, and is the last addition to the three-factor model. The incorporation of the profitability factor (RMW_t) and the investment factor (CMA_t) into Eq. (5) leads to the five-factor model, which is an improvement of the three-factor model [50]. The estimates of stock market returns for the five-factor model are expressed as Eq. (6):

$$R_{itm} - R_{ft} = \alpha_1 + \beta_1(R_{Mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 RMW_t + \beta_5 CMA_t + \psi_{itm} \tag{6}$$

where RMW_t denotes the profitability factor during year *t*, CMA_t is the investment factor during year *t*, and ψ_{itm} is the residual term of Eq. (6). This paper refers to the standard deviation of ψ_{itm} as the third proxy variable for idiosyncratic risks (IR_FIV).

3.3 Explanatory variables

(1) Measurement of investment inefficiency

This paper measures investment inefficiency ($INEFF$) by using previous methods [8, 11]. Eq. (7) calculates the residual of investment efficiency (δ_{it}):

$$INVEST_{it} = \alpha_1 + \alpha_2 SalesGrowth_{it-1} + \delta_{it} \tag{7}$$

Eq. (7) estimates the annual residual of the industry year (δ_{it}). The symbol $INVEST_{it}$ denotes the investment by Firm *i* during year t, as calculated with R&D expenses minus the purchase of fixed assets and the acquisition of other firms, plus the disposal of fixed assets, which is then deflected with sales during year *t-1*. $SalesGrowth_{it-1}$ denotes the change of sales during year *t-1* deflected with the sales during year t-2. The next step is to rank investment efficiency ($INEFF$) into overinvestment ($OVER_I$) and underinvestment ($UNDER\_I$) according to the estimated residual of investment efficiency (δ_{it}). A dummy variable is set up for overinvestment ($OVER\_I$). If the residual (δ_{it}) is above the 75% percentile of the sample, it is deemed as overinvestment and the dummy variable is 1. If not, the dummy variable is zero. The dummy variable for underinvestment ($UNDER\_I$) is 1 if the residual (δ_{it}) falls below the 25% percentile of the sample. If not, it is zero.

(2) Measurement of accounting conservatism

To gain an understanding of the level of accounting conservatism for each firms in different industries, this paper measures accounting conservatism (COM_{it}) with the C_Score coefficient estimation method [51]. The estimated coefficient C_Score for the industry year is referred to as the variable (COM_NI). The estimation method is expressed, as follows:

$$E_{it} = \alpha_1 + \alpha_2 NEG_{it} + \alpha_3 RET_{it} + \alpha_4 NEG_{it} * RET_{it} + \varepsilon_{it} \quad (8)$$

The first step is to establish Eq. (8), which is the conventional Basu model for asymmetric timeliness of earnings recognition. The disclosed information in the proxy market for stock returns is observed with α coefficients, i.e. response to good news and bad news. The symbols α_3 and α_3+α_4 denote the responsiveness of earnings to bad news and the incremental response to bad news, respectively. The symbol α_2 indicates the responsiveness of accounting earnings to good news. In Eq. (8), the variable E_{it} represents the earnings of Firm *i* during year t deflected with the market value at the beginning of the period; $\mathrm{NEG_{it}}$ is a dummy variable. If the RET of Firm i during year t is negative, the dummy variable is 1. If not, the dummy variable is zero. RET_{it} denotes the stock return of Firm *i* during year t. As Taiwan's government requires the publication of annual reports before March 31 of the following year, the variable RET_{it} is calculated with the continued multiplication of monthly returns (monthly return/100 + 1) minus 1 from the end of April during year t to the end of March during year t-1.

Next, Eq. (9) is brought into Eq. (8) to construct Eq. (10). The coefficients $\lambda_1, \lambda_2, \lambda_3, \lambda_4$ in Eq. (10) are estimated for each industry year, and then, introduced into Eq. (9) to derive the C_Score (COM_NI) of each Firm for different industry years, as the measurement of accounting conservatism.

$$COM\_NI \equiv \lambda_1 + \lambda_2 S_{it} + \lambda_3 M_{it} + \lambda_4 L_{it} \quad (9)$$

$$Earn_{it} = \beta_1 + \beta_2 NEG_{it} + (\mu_1 + \mu_2 S_{it} + \mu_3 M_{it} + \mu_4 L_{it}) * RET_{it} + (\lambda_1 + \lambda_2 S_{it} + \lambda_3 M_{it} + \lambda_4 L_{it}) * NEG_{it} * RET_{it} + \nu_1 S_{it} + \nu_2 M_{it} + \nu_3 L_{it} + \nu_4 S_{it} * NEG_{it} + \nu_5 M_{it} * NEG_{it} + \nu_6 L_{it} * NEG_{it} + \varepsilon_{it} \quad (10)$$

where S_{it} denotes the market capitalization at the beginning of the year for Firm i during year t (calculated with the natural logarithm), M_{it} is the price-to-book ratio of Firm i during year t, and L_{it} is the debt ratio of Company i during year t.

4. EMPIRICAL RESULTS

4.1 Sample Selection

The research data of firms listed on the Taiwan Stock Exchange and the Taipei Exchange was sourced from the Economic Journal Database. The data of idiosyncratic risks as a variable was derived from the multi-factor market model. The data of manager's investment efficiency and accounting conservatism were estimated from financials. The sampling period was 2006-2016. This paper obtained a total of 20,066 observations of original financial data. The financial industry was removed from the sample pool due to its unique classification of accounting items and industry characteristics. After the deletion of incomplete data entries regarding assets, equity, earnings, and expenses, a total of 14,916 observations remained. Finally, this paper had 10,038 annual data entries after the removal of incomplete numbers regarding dependent variables and explanatory variables. All the outliers were processed with the winsorization technique at the 1% level. The sample screening process is summarized in Table 1.

Table 1:

Sample Screening	
Screening process	
Firm-year observations (listed firms)	20,066
Deletion:	
Financial institutions	(772)
Zero or negative in asset/equity value	(59)
Zero or negative in revenue, market value or expenses, missing data	(1,280)
Missing data in control variables	(3,039)

Subtotal	14,916
Missing data in variables associated with idiosyncratic risks	(2,527)
Missing data in variables associated with investment efficiency	(1,999)
Missing data in variables associated with accounting conservatism	(352)
Total number of observations sampled	10,038

4.2 Descriptive statistics

Table 2 shows the descriptive statistics of the sample. Panel A presents the means of idiosyncratic risks for the one-factor model (IR_ONE), the three-factor model (IR_{THR}), and the five-factor model (IR_FIV) at 9.235, 7.800, and 6.567, respectively. The median values of idiosyncratic risks (IR) are 8.015, 6.672, and 5.560, respectively, which are all below the means. The means of the estimated residual (δ) for manager's investment efficiency are closer to zero. The minimum and maximum values of accounting conservatism (COM_NI) are -0.517 and 0.706, respectively, and the large range suggests variances between firms. In terms of control variables, the mean and the median of return on assets (ROA) are 0.027 and 0.034, respectively. The firm size ($SIZE$) data is rightly skewed. The average debt ratio is 41.1%. Panel B shows the tests of difference between overinvested firms and underinvested firms. The results indicate that there are differences between overinvested firms and underinvested firms, as measured by idiosyncratic risks (IR). The overinvested firms exhibit higher means of idiosyncratic risks (IR) than the underinvested firms indicating that overinvestment comes with greater firm-specific risks, and hence, idiosyncratic risks to investors. The underinvested firms report lower firm-specific risks, and thus, idiosyncratic risks are assumed of investors.

Table 2: Descriptive Statistics

Panel A						
Variable	N	Mean	Median	Std.	Min.	Max.
IR_ONE	10,038	9.235	8.015	5.402	2.092	31.528
IR_THR	10,038	7.800	6.672	4.717	1.661	27.520
IR_FIV	10,038	6.567	5.560	4.080	1.308	23.833
δ_{it}	10,038	-0.023	-0.031	0.188	-0.847	0.873

COM_NI	10,038	0.059	0.057	0.196	-0.517	0.706
ROA	10,038	0.027	0.034	0.087	-0.356	0.231
$SIZE$	10,038	15.30	15.12	1.381	12.58	19.82
LEV	10,038	0.411	0.412	0.175	0.063	0.842

Panel B

	Overinvestment (N=2,510)		Underinvestment (N=2,520)		Tests of difference	
	Mean	Std.	Mean	Std.	χ^2	*p-value*
IR_ONE	10.073	5.762	9.370	5.451	23.647	(0.000)
IR_THR	8.531	5.032	7.889	4.748	23.643	(0.000)
IR_FIV	7.192	4.334	6.666	4.108	21.857	(0.000)

Note:

IR_ONE = the estimated standard deviation of residuals in the single-factor CAPM model;
IR_THR = the estimated standard deviation of residuals in the three-factor CAPM model by Fama-French;
IR_FIV= the estimated standard deviation of residuals in the five-factor CAPM model by Fama-French;
$OVER\_I$= the dummy variable for overinvestment, 1 if the residual (δ_{it}) is higher than 75% percentile and 1 if not;
$UNDER\_I$= the dummy variable for underinvestment, 1 if the residual (δ_{it}) is lower than 25% percentile and 1 if not;
δ_{it} = the estimated residual for industry years based on the regression of investment to sales growth;
COM_NI= C_score value estimated for each industry year according to the previous model [51];
ROA= return on assets of Firm i *during year t*; $SIZE$= *natural logarithm of total assets during year t;*
LEV =debt ratio/100 during year *t*.

4.3 Correlation coefficients

Table 3 shows the Pearson coefficients of the complete sample. The direction of the explained variables for idiosyncratic risks (IR) is consistent. The direction of overinvestment (*OVER_I*) and idiosyncratic risks (IR) is expected to be consistently positive. There is significant and negative correlation between overinvestment (*OVER_I*) and underinvestment (*UNDER_I*). All the independent variables have coefficients below 0.7, suggesting that collinearity is not a major issue for regression analysis.

Table 3: Pearson Coefficients

	IR_ONE	IR_THR	IR_FIV	$OVER\_I$	$UNDER\_I$	COM_NI	ROA	$SIZE$	LEV
IRL_ONE	1								
IR_THR	.960**	1							
IR_FIV	.919**	.956**	1						
$OVER\_I$	.089**	.089**	.088**	1					
$UNDER\_I$	.014	.011	.014	-.334**	1				
COM_NI	.123**	.112**	.114**	-.021*	.052**	1			
ROA	-.215**	-.198**	-.194**	-.019	-.035**	-.321**	1		
$SIZE$	-.264**	-.246**	-.249**	-.015	-.077**	-.331**	.215**	1	
LEV	.089**	.094**	.090**	-.070**	-.003	.288**	-.231**	.295**	1

Note:

1. **statistical significance at 1% significance level (two tails)
 *. statistical significance at 5% significance level (two tails)
2. Variable definitions:

IR_ONE = the estimated standard deviation of residuals in the single-factor CAPM model;
IR_THR = the estimated standard deviation of residuals in the three-factor CAPM model by Fama-French; IR_FIV= the estimated standard deviation of residuals in the five-factor CAPM model by Fama-French;

$OVER\_I$= the dummy variable for overinvestment, 1 if the residual (δ_{it}) is higher than 75% percentile and 1 if not;
$UNDER\_I$= the dummy variable for underinvestment, 1 if the residual (δ_{it}) is lower than 25% percentile and 1 if not;
δ_{it} = the estimated residual for industry years based on the regression of investment to sales growth;

COM_NI= C_score value estimated for each industry year according to the previous model [51];
ROA= return on assets of Firm i *during the year t*; *SIZE= natural logarithm of total assets during year t;*
LEV =debt ratio/100 during year *t*.

4.4 Regression analysis

Panel 4 of Table 4 summarizes the regression results of the effect of manager's overinvestment on idiosyncratic risks to investors. The numbers in (1), (2), and (3) represent the idiosyncratic risks in the single-factor model (IR_ONE), the three-factor model (IR_THR), and the five-factor model (IR_FIV), respectively. The results indicate a significant and positive correlation between overinvestment ($OVER\_I$) and all the three types of idiosyncratic risks (IR), at the estimated coefficients of 1.171, 1.031, and 0.881, which all reach the 1% significance level. This suggests that manager's overinvestment decision boosts firm-specific risks, and thus, idiosyncratic risks to investors. Panel B shows the regression results of the influence of manager's underinvestment on the idiosyncratic risks assumed of investors. While there is negative correlation between underinvestment ($UNDER\_I$) and all three types of idiosyncratic risks (IR), it is not significantly different from zero. This may be a lower firm-specific risk resulted from manager's underinvestment, and hence, reduced investment from investors and undermined influence on idiosyncratic risks.

Table 5 indicates the regression results of the influence of accounting conservatism on idiosyncratic risks. There is significant and negative correlation between accounting conservatism (COM_NI) and all three types of idiosyncratic risks (IR). The coefficients are estimated to be -1.959, -1.810, and -1.474, respectively, which all reach the 1% significance level, and are consistent with H2. This implies that a higher level of accounting conservatism mitigates the information asymmetry between managers and investors, and thus, lowers the idiosyncratic risks assumed of investors.

Table 4: Regression of Manager 's Investment Efficiency on Idiosyncratic Risks to Investors

Panel A

	IR_ONE		*IR_THR*		*IR_FIV*	
	(1)		(2)		(3)	
	Coeff.	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*
Constant	24.103	(0.000)	20.017	(0.000)	17.275	(0.000)
OVER_I	1.171	(0.000)	1.031	(0.000)	0.881	(0.000)
ROA	-7.191	(0.000)	-5.489	(0.000)	-4.544	(0.000)
SIZE	-1.103	(0.000)	-0.918	(0.000)	-0.802	(0.000)
LEV	4.678	(0.000)	4.201	(0.000)	3.580	(0.000)
N	10,038		10,038		10,038	
Adj. R^2	0.121		0.109		0.108	

Panel B

	IR_ONE	*IR_THR*	*IR_FIV*
	(1)	(2)	(3)

	Coeff.	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*
Constant	24.477	(0.000)	20.360	(0.000)	17.550	(0.000)
$UNDER\_I$	-0.138	(0.240)	-0.143	(0.167)	-0.093	(0.296)
ROA	-7.447	(0.000)	-5.716	(0.000)	-4.736	(0.000)
$SIZE$	-1.100	(0.000)	-0.915	(0.000)	-0.799	(0.000)
LEV	4.436	(0.000)	3.989	(0.000)	3.397	(0.000)
N	10,038		10,038		10,038	
Adj. R^2	0.113		0.101		0.100	

Note:

IR_ONE = the estimated standard deviation of residuals in the single-factor CAPM model;

IR_THR = the estimated standard deviation of residuals in the three-factor CAPM model by Fama-French; IR_FIV= the estimated standard deviation of residuals in the five-factor CAPM model by Fama-French;

$OVER\_I$= the dummy variable for overinvestment, 1 if the residual (δ_{it}) is higher than 75% percentile and 1 if not;

$UNDER\_I$= the dummy variable for underinvestment, 1 if the residual (δ_{it}) is lower than 25% percentile and 1 if not;

δ_{it} = the estimated residual for industry years based on the regression of investment to sales growth;

ROA= return on assets of Firm i *during year t*; $SIZE$= *natural logarithm of total assets during year t;*

LEV =debt ratio/100 during year *t*.

Table 5: Regression of Accounting Conservatism on Idiosyncratic Risks to Investors

	IR_ONE		IR_THR		IR_FIV	
	(1)		(2)		(3)	
	Coeff.	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*
Constant	25.938	(0.000)	21.699	(0.000)	18.655	(0.000)
COM_NI	-1.959	(0.000)	-1.810	(0.000)	-1.474	(0.000)
ROA	-8.076	(0.000)	-6.295	(0.000)	-5.209	(0.000)
$SIZE$	-1.210	(0.000)	-1.017	(0.000)	-0.883	(0.000)
LEV	5.253	(0.000)	4.743	(0.000)	4.013	(0.000)
N	10,038		10,038		10,038	
Adj. R^2	0.116		0.104		0.103	

Note:

IR_ONE = the estimated standard deviation of residuals in the single-factor CAPM model;

IR_THR = the estimated standard deviation of residuals in the three-factor CAPM model by Fama-French; IR_FIV= the estimated standard deviation of residuals in the five-factor CAPM model by Fama-French;

COM_NI= C_score value estimated for each industry year according to the previous model [51];

ROA= return on assets of Firm i *during year t*; $SIZE$= *natural logarithm of total assets during year t;*

LEV =debt ratio/100 during year *t*.

Table 6: Regression of Interaction Term on Idiosyncratic Risks to Investors

Panel A

	IR_ONE		IR_THR		IR_FIV	
	(1)		(2)		(3)	
	Coeff.	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*
Constant	25.662	(0.000)	21.454	(0.000)	18.448	(0.000)
$OVER\_I$	1.265	(0.000)	1.104	(0.000)	0.951	(0.000)
COM_NI	-1.523	(0.000)	-1.468	(0.000)	-1.147	(0.000)
$OVER\_I$×*COM_IN*	-1.754	(0.003)	-1.370	(0.008)	-1.315	(0.003)
ROA	-7.877	(0.000)	-6.115	(0.000)	-5.059	(0.000)
$SIZE$	-1.221	(0.000)	-1.026	(0.000)	-0.891	(0.000)
LEV	5.535	(0.000)	4.987	(0.000)	4.225	(0.000)
N	10,038		10,038		10,038	
Adj. R^2	0.125		0.114		0.112	

Panel B

	IR_ONE		IR_THR		IR_FIV	

	(1)		(2)		(3)	
	Coeff.	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*
Constant	26.034	(0.000)	21.789	(0.000)	18.715	(0.000)
$UNDER\_I$	-0.210	(0.092)	-0.182	(0.095)	-0.125	(0.188)
COM_NI	-2.282	(0.000)	-2.006	(0.000)	-1.631	(0.000)
$UNDER\_I \times COM\_NI$	1.214	(0.037)	0.751	(0.143)	0.597	(0.179)
ROA	-8.046	(0.000)	-6.280	(0.000)	-5.195	(0.000)
$SIZE$	-1.214	(0.000)	-1.021	(0.000)	-0.885	(0.000)
LEV	5.277	(0.000)	4.759	(0.000)	4.025	(0.000)
N	10,038		10,038		10,038	
Adj. R^2	0.116		0.105		0.103	

Note:

IR_ONE = the estimated standard deviation of residuals in the single-factor CAPM model;
IR_THR = the estimated standard deviation of residuals in the three-factor CAPM model by Fama-French; IR_FIV= the estimated standard deviation of residuals in the five-factor CAPM model by Fama-French;

$OVER\_I$= the dummy variable for overinvestment, 1 if the residual (δ_{it}) is higher than 75% percentile and 1 if not;
$UNDER\_I$= the dummy variable for underinvestment, 1 if the residual (δ_{it}) is lower than 25% percentile and 1 if not;

δ_{it} = the estimated residual for industry years based on the regression of investment to sales growth;

COM_NI= C_score value estimated for each industry year according to the model [51];

ROA= return on assets of Firm i *during year t*; $SIZE$= *natural logarithm of total assets during year t;*

LEV =debt ratio/100 during year *t*.

Table 6 shows the regression results of the interaction term on the idiosyncratic risks to investors. Panel A suggests that the interaction term of overinvestment and accounting conservatism ($OVER\_I \times COM\_NI$)is significantly and negatively correlated with all three types of idiosyncratic risks (IR), at coefficients of -1.754, -1.370, and -1.315, respectively. This indicates that accounting conservatism mitigates manager's overinvestment decisions. As enhanced accounting conservatism allows managers to realize that investments are no longer efficient, they will cut down unnecessary investments.

Panel B on underinvestment shows significant and negative correlation between underinvestment ($UNDER\_I$) and idiosyncratic risks in the single-factor model (IR_ONE). This suggests that managers are risk averse and the firm-specific risks are obviously too low. As a result, the volatility of idiosyncratic risks is reduced for investors. There is significant and positive correlation between the interaction term of underinvestment and accounting conservatism ($UNDER\_I \times COM\_NI$) and idiosyncratic risks in the single-factor model (IR_ONE). In other words, accounting conservatism improves the problems of managers underinvestment. Enhanced accounting conservatism helps stakeholders to supervise managers, which prompts managers to actively seek positive-NPV projects, and the result is higher firm-specific risks and greater idiosyncratic risks to investors. The idiosyncratic risks in the three-factor model (IR_THR) and the five-factor model (IR_FIV) do not exhibit statistical significance, which is possibly due to the over-specification of the two models. The response to Fama-French's five factor model has been poor in the industry, as more is not better.

4.5 Sensitivity analysis

The C_Score (COM_KW) [51] as the annual coefficients for each firm is commonly used as the metric for accounting conservatism. Therefore, this paper incorporates this variable (COM_KW) into sensitivity analysis. The results of sensitivity analysis on accounting conservatism (COM_KW), as shown in Table 7, are consistent with the C_Score (COM_NI), while the estimated annual coefficient for different industries are shown in Table 5. This supports the argument that the higher the accounting conservatism, the lower the idiosyncratic risks to investors.

Table 7: Sensitivity Analysis of Accounting Conservatism on Idiosyncratic Risks to Investors

	IR_ONE		IR_THR		IR_FIV	
	(1)		(2)		(3)	
	Coeff.	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*
Constant	47.214	(0.000)	40.919	(0.000)	34.350	(0.000)
COM_KW	-27.239	(0.000)	-24.643	(0.000)	-20.119	(0.000)
ROA	-14.187	(0.000)	-11.813	(0.000)	-9.714	(0.000)
$SIZE$	-2.968	(0.000)	-2.605	(0.000)	-2.179	(0.000)
LEV	26.760	(0.000)	24.185	(0.000)	19.887	(0.000)
N	10,038		10,038		10,038	
Adj. R^2	0.173		0.166		0.158	

Note:

IR_ONE = the estimated standard deviation of residuals in the single-factor CAPM model;

IR_THR = the estimated standard deviation of residuals in the three-factor CAPM model by Fama-French; IR_FIV= the estimated standard deviation of residuals in the five-factor CAPM model by Fama-French;

COM_NI= C_score value estimated for each industry year according to the previous model [51];

ROA= return on assets of Firm i *during year t*; $SIZE$*= natural logarithm of total assets during year t;*

LEV =debt ratio/100 during year *t*.

Table 8: Sensitivity Analysis of Interaction Term on Idiosyncratic Risks to Investors

Panel A

	IR_ONE (1)		*IR_THR* (2)		*IR_FIV* (3)	
	Coeff.	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*
Constant	46.314	(0.000)	40.137	(0.000)	33.669	(0.000)
OVER_I	1.078	(0.000)	0.890	(0.000)	0.767	(0.000)
COM_KW	-25.860	(0.000)	-23.556	(0.000)	-19.193	(0.000)
OVER_I×COM_KW	-2.344	(0.001)	-1.568	(0.009)	-1.280	(0.014)
ROA	-13.812	(0.000)	-11.485	(0.000)	-9.429	(0.000)
SIZE	-2.922	(0.000)	-2.564	(0.000)	-2.144	(0.000)
LEV	26.313	(0.000)	23.787	(0.000)	19.539	(0.000)
N	10,038		10,038		10,038	
Adj. R^2	0.178		0.170		0.162	

Panel B

	IR_ONE		IR_THR		IR_FIV	
	(1)		(2)		(3)	
	Coeff.	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*
Constant	47.323	(0.000)	41.025	(0.000)	34.420	(0.000)
$UNDER\_I$	-0.291	(0.041)	-0.258	(0.040)	-0.175	(0.107)
COM_KW	-27.502	(0.000)	-24.841	(0.000)	-20.261	(0.000)
$UNDER\_I \times COM\_KW$	1.233	(0.073)	0.927	(0.124)	0.662	(0.206)
ROA	-14.167	(0.000)	-11.800	(0.000)	-9.705	(0.000)
$SIZE$	-2.970	(0.000)	-2.607	(0.000)	-2.181	(0.000)
LEV	26.714	(0.000)	24.152	(0.000)	19.863	(0.000)
N	10,038		10,038		10,038	
Adj. R^2	0.173		0.166		0.158	

Note:

IR_ONE = the estimated standard deviation of residuals in the single-factor CAPM model;

IR_THR = the estimated standard deviation of residuals in the three-factor CAPM model by Fama-French; IR_FIV= the estimated standard deviation of residuals in the five-factor CAPM model by Fama-French;

$OVER\_I$= the dummy variable for overinvestment, 1 if the residual (δ_{it}) is higher than 75% percentile and 1 if not;

$UNDER\_I$= the dummy variable for underinvestment, 1 if the residual (δ_{it}) is lower than 25% percentile and 1 if not;

δ_{it} = the estimated residual for industry years based on the regression of investment to sales growth;

COM_NI= C_score value estimated for each industry year according to the previous model [51];

ROA= return on assets of Firm i *during year t*; $SIZE$= *natural logarithm of total assets during year t;*

LEV =debt ratio/100 during year *t*.

The results of sensitivity analysis on the interaction term of investment efficiency and accounting conservatism (COM_KW), as shown in Table 8, are in line with the results shown in Table 6. This supports H3, that the implementation of accounting conservatism improves manager's investment efficiency. Enhanced accounting conservatism rectifies the problems of manager's overinvestment and underinvestment. It is important to consider the difference in funding sources for overinvestment from one firm to another. This paper refers to the pecking order theory [52], which posits that managers first resort to internal capital (i.e. retained earnings) for funding sources, followed by debts; because of debt covenants, managers will only consider debt financing if internal capital is insufficient. The least preferred source is cash injection, which is due to the likely scrutiny from major shareholders and the agency problem with original shareholders. This paper divides the sampled firms into four types according to the pecking order theory.

Type 1 : Firms with ample internal capital

Managers have access to ample cash for investments, thus, there is no need to be bothered with debt financing or cash injection.

Type 2 : Firms restricted by debt covenants

Manager's hands are tied because of debt covenants, i.e. contracts with banks. Due to an insufficiency of internal capital, managers obtain extra cash from debt financing.

Type 3 : Dual oversight from creditors and shareholders

Managers are subject to supervision from creditors and shareholders. Due to a severe lack of internal capital, managers must rely on both debt financing and cash injection.

Type 4 : Contrary to the pecking order theory

Due to financial distress or poor credit ratings, managers resorts to cash injection as the only way to access capital.

This paper divided the sample into four subgroups according to net debt financing and net cash injection amounts. The net debt financing was calculated with net short-term and long-term borrowing plus corporate bonds issued minus corporate bonds repaid. Net cash injection was estimated with cash injection less cash reduction. The number of observations (firm-year data) was reduced from 10,038 to 9,917 after net debt financing and net cash injection values were taken into consideration. Type 1 firms have ample internal capital, defined as zero or negative net debt financing and net cash injection values. Type 2 firms are subject to supervision from creditors, and are defined with positive net debt financing and zero/negative net cash injection values. Type 3 firms are scrutinized by both creditors and shareholders, with positive net debt financing and net cash injection amounts. Type 4 firms, counter to the pecking order theory, have zero/negative net debt financing and positive net cash injections by value. In aggregate, this paper sourced 9,917 observations: 4,974 for Type 1 firms; 3,962 for Type 2 firms; 440 for Type 3; 541 for Type 4. Tables 9 to 11 present the sensitivity analysis of manager's overinvestment in these four types of firms, respectively.

Table 9: Sensitivity Analysis on Type 1 Companies with Ample International Capital

	IR_ONE		IR_THR		IR_FIV	
	(1)		(2)		(3)	
	Coeff.	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*
Constant	24.083	(0.000)	19.842	(0.000)	17.283	(0.000)
$OVER\_I$	1.467	(0.000)	1.333	(0.000)	1.132	(0.000)
COM_NI	-1.200	(0.013)	-1.267	(0.003)	-1.052	(0.004)
$OVER\_I$×*COM_IN*	-1.059	(0.238)	-0.601	(0.447)	-0.849	(0.216)
ROA	-5.999	(0.000)	-4.529	(0.000)	-4.055	(0.000)
$SIZE$	-1.140	(0.000)	-0.938	(0.000)	-0.826	(0.000)
LEV	6.072	(0.000)	5.352	(0.000)	4.473	(0.000)
N	4,974		4,974		4,974	
Adj. R^2	0.111		0.098		0.098	

Note:

IR_ONE = the estimated standard deviation of residuals in the single-factor CAPM model;

IR_THR = the estimated standard deviation of residuals in the three-factor CAPM model by Fama-French; IR_FIV= the estimated standard deviation of residuals in the five-factor CAPM model by Fama-French;

$OVER\_I$= the dummy variable for overinvestment, 1 if the residual (δ_{it}) is higher than 75% percentile and 1 if not;

$UNDER\_I$= the dummy variable for underinvestment, 1 if the residual (δ_{it}) is lower than 25% percentile and 1 if not;

δ_{it} = the estimated residual for industry years based on the regression of investment to sales growth;

COM_NI= C_score value estimated for each industry year according to the previous model [51];

ROA= return on assets of Firm i *during year t*; $SIZE$= *natural logarithm of total assets during year t;*

LEV =debt ratio/100 during year *t*.

Table 10: Sensitivity Analysis on Type 2 Companies Restricted by Debt Providers

	IR_ONE (1)		IR_THR (2)		IR_FIV (3)	
	Coeff.	*p-value*	*Coeff.*	*p-value*		*p-value*
Constant	23.673	(0.000)	19.617	(0.000)	16.649	(0.000)
$OVER\_I$	0.936	(0.000)	0.812	(0.000)	0.704	(0.000)
COM_NI	-1.493	(0.002)	-1.257	(0.004)	-0.867	(0.020)
$OVER\_I \times COM\_IN$	-1.930	(0.024)	-1.780	(0.017)	-1.575	(0.014)
ROA	-4.507	(0.000)	-2.889	(0.002)	-1.778	(0.028)
$SIZE$	-1.099	(0.000)	-0.914	(0.000)	-0.784	(0.000)
LEV	4.489	(0.000)	4.092	(0.000)	3.555	(0.000)

N	3,962	3,962	3,962
Adj. R^2	0.096	0.085	0.083

Note:

IR_ONE = the estimated standard deviation of residuals in the single-factor CAPM model;

IR_THR = the estimated standard deviation of residuals in the three-factor CAPM model by Fama-French; IR_FIV= the estimated standard deviation of residuals in the five-factor CAPM model by Fama-French;

$OVER\_I$= the dummy variable for overinvestment, 1 if the residual (δ_{it}) is higher than 75% percentile and 1 if not;

$UNDER\_I$= the dummy variable for underinvestment, 1 if the residual (δ_{it}) is lower than 25% percentile and 1 if not;

δ_{it} = the estimated residual for industry years based on the regression of investment to sales growth;

COM_NI= C_score value estimated for each industry year according to the previous model [51];

ROA= return on assets of Firm i *during year t*; $SIZE$= *natural logarithm of total assets during year t;*

LEV =debt ratio/100 during year *t*.

Table 11: Sensitivity Analysis on Type 3 Companies Restricted by Both Debt and Equity Providers

	IR_ONE		IR_THR		IR_FIV	
	(1)		(2)		(3)	
	Coeff.	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*
Constant	28.204	(0.000)	25.073	(0.000)	20.600	(0.000)
$OVER\_I$	1.744	(0.001)	1.335	(0.005)	1.209	(0.004)
COM_NI	-2.986	(0.085)	-2.710	(0.076)	-2.148	(0.103)
$OVER\_I \times COM\_IN$	1.434	(0.534)	0.811	(0.689)	0.590	(0.736)
ROA	-8.519	(0.004)	-6.529	(0.011)	-4.248	(0.055)
$SIZE$	-1.275	(0.000)	-1.180	(0.000)	-0.978	(0.000)
LEV	4.170	(0.024)	4.378	(0.007)	4.070	(0.004)
N	440		440		440	
Adj. R^2	0.140		0.134		0.118	

Note:

IR_ONE = the estimated standard deviation of residuals in the single-factor CAPM model;
IR_THR = the estimated standard deviation of residuals in the three-factor CAPM model by Fama-French; IR_FIV= the estimated standard deviation of residuals in the five-factor CAPM model by Fama-French;

$OVER\_I$= the dummy variable for overinvestment, 1 if the residual (δ_{it}) is higher than 75% percentile and 1 if not;

$UNDER\_I$= the dummy variable for underinvestment, 1 if the residual (δ_{it}) is lower than 25% percentile and 1 if not;

δ_{it} = the estimated residual for industry years based on the regression of investment to sales growth;

COM_NI= C_score value estimated for each industry year according to the previous model [51];

ROA= return on assets of Firm i *during year t*; $SIZE$= *natural logarithm of total assets during year t;*

LEV =debt ratio/100 during year *t*.

Table 9 shows the sensitivity analysis of Type 1 firms that have ample internal capital. The results suggest significant and positive correlation between overinvestment ($OVER\_I$) and all three types of idiosyncratic risks (IR). The high internal cash flows are given manager's abundant power to pursue non-rational investments. manager's overinvestment significantly boosts the idiosyncratic risks assumed by investors. Meanwhile, there is significant and negative correlation between accounting conservatism (COM_NI) and all three types of idiosyncratic risks (IR), as accounting conservatism effectively mitigates information asymmetry, and hence, idiosyncratic risks. Finally, the correlation between the interaction term of overinvestment and accounting conservatism ($OVER\_I \times COM\_NI$) and all types of idiosyncratic risks (IR) is statistically insignificant. This suggests that the counterbalancing effect of accounting conservatism on manager's overinvestment is muted in the presence of too much internal capital.

Table 10 exhibits the sensitivity analysis of Type 2 firms subject to restrictions imposed by debt providers. The results indicate significant and positive correlation between overinvestment ($OVER\_I$) and all three types of idiosyncratic risks (IR). There is significant and negative correlation between accounting conservatism (COM_NI) and all three types of idiosyncratic risks (IR). These findings are consistent with prior results. Finally, the interaction term of overinvestment and accounting conservatism ($OVER\_I \times COM\_NI$) is negatively and significantly correlated with all types of idiosyncratic risks (IR), which is consistent with the results in Table 6 regarding overinvestment. In other words, the implementation of accounting conservatism can effectively mitigate manager's overinvestment under the restrictions imposed by debt providers.

Table 11 presents the sensitivity analysis of Type 3 firms subject to the scrutiny of both debt providers and shareholders. Due to severe insufficient internal capital, managers are in urgent need of both debt and equity financing. The analysis results suggest insignificant correlation only between accounting conservatism (COM_NI) and the idiosyncratic risks in the five-factor model (IR_FIV), which implies the substitution effect between dual oversight from creditors and shareholders and accounting conservatism. The correlation between the interaction term of overinvestment and accounting conservatism ($OVER\_I \times COM\_NI$) and all types of idiosyncratic risks (IR) is insignificant. In other words, double supervision from debt and equity providers forces managers to turn conservative, which blurs the mitigating effect of accounting conservatism on overinvestment.

Table 12 presents the sensitivity analysis of Type 4 firms contrary to the pecking order theory. The results suggest insignificant correlation between overinvestment ($OVER\_I$) and all three types of idiosyncratic risks (IR), which indicates poor financials and the need for managers to repay debts by issuing new shares. At this juncture, manager's decision can no longer affect the idiosyncratic risks to investors. Meanwhile, the interaction term of overinvestment and accounting conservatism ($OVER\_I \times COM\_NI$) is not significantly correlated with any type of idiosyncratic risks (IR). The poor financial status of the firms forces managers to turn conservative. Thus, the weakening effect of accounting conservatism on idiosyncratic risks becomes less obvious.

Table 12: Sensitivity Analysis on Type 4 Companies in Contrary with Pecking Order Theory

	IR_ONE		IR_THR		IR_FIV	
	(1)		(2)		(3)	
	Coeff.	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*
Constant	38.218	(0.000)	33.162	(0.000)	29.066	(0.000)
$OVER\_I$	0.701	(0.290)	0.676	(0.249)	0.720	(0.158)
COM_NI	-3.409	(0.037)	-3.551	(0.014)	-2.909	(0.021)
$OVER\_I \times COM\_IN$	-1.531	(0.570)	-0.211	(0.930)	-0.357	(0.863)
ROA	7.933	(0.000)	7.659	(0.000)	6.565	(0.000)
$SIZE$	-11.363	(0.000)	-9.617	(0.000)	-8.526	(0.000)
LEV	-1.887	(0.000)	-1.680	(0.000)	-1.500	(0.000)
N	541		541		541	
Adj. R^2	0.199		0.200		0.209	

Note:

IR_ONE = the estimated standard deviation of residuals in the single-factor CAPM model;

IR_THR = the estimated standard deviation of residuals in the three-factor CAPM model by Fama-French; IR_FIV= the estimated standard deviation of residuals in the five-factor CAPM model by Fama-French;

$OVER\_I$= the dummy variable for overinvestment, 1 if the residual (δ_{it}) is higher than 75% percentile and 1 if not;

$UNDER\_I$= the dummy variable for underinvestment, 1 if the residual (δ_{it}) is lower than 25% percentile and 1 if not;

δ_{it} = the estimated residual for industry years based on the regression of investment to sales growth;

COM_NI= C_score value estimated for each industry year according to the previous model [51];

ROA= return on assets of Firm i *during year t*; $SIZE$= *natural logarithm of total assets during year t;*

LEV =debt ratio/100 during year *t*.

The empirical findings are as follows:

(1) Manager's overinvestment boosts the firm-specific risks and the corresponding idiosyncratic risks assumed of investors.

(2) Manager's underinvestment reduces the firm-specific risks and the corresponding lower investment from investors will mute the effects on idiosyncratic risks.

(3) The higher the level of accounting conservatism, the better the information quality and the lower the idiosyncratic risks to investors.

(4) Accounting conservatism mitigates manager's overinvestment (underinvestment) and reduces (enhances) idiosyncratic risks assumed of investors.

Below is a summary of sensitivity analysis findings:

(1) If there is too much internal capital, managers do not have to raise debt or equity financing, which means they are not subject to external oversight, and at this juncture, managers are likely to overinvest. As a consequence, the idiosyncratic risks to investors are significantly higher. Too much available capital also undermines the balancing effect of accounting conservatism on manager's impulsive decisions on investing.

(2) Debt providers exercise robust supervision of managers. In this instance, accounting conservatism can effectively remedy manager's investment inefficiency.

(3) If the internal capital is rather insufficient, managers must rely on both debt and equity financing. In this scenario, managers are likely to be scrutinized by both creditors and shareholders. This makes the mitigating effect of accounting conservatism on manager's investment inefficiency less significant.

(4) If the firm suffers poor credit ratings and financial distress, managers have to issue new shares for restructuring or repaying debts. This forces managers to turn conservative in investment decisions.

5. CONCLUSIONS

Most literature on investment efficiency delves into information quality, while there are very few studies on the relationship between investment efficiency and idiosyncratic risks to investors. Managers are usually motivated to pursue their own interest, and thus, likely to go for riskier and negative-NPV projects. Equally, manager's underinvestment may cause agency problems with investors. While this paper explores the respective influence of manager's investment inefficiency and accounting conservatism on idiosyncratic risks to investors, it also examines the relative effect of investment efficiency mitigated by accounting conservatism on idiosyncratic risks.

The empirical findings suggest that manager's manager inefficiency affects the idiosyncratic risks to investors.

5.1 Manager's overinvestment increases the idiosyncratic risks to investors.

5.2 Accounting conservatism enhances information quality and reduces idiosyncratic risks to investors.

5.3 Accounting conservatism mitigates manager's overinvestment (underinvestment) and lowers (increases) idiosyncratic risks to investors.

5.4 In the presence of weak financial constraints, it is difficult for accounting conservatism to keep manager's overinvestment in check.

5.5 Stringent financial constraints force managers to turn conservatism.

The contribution of this paper is to provide an analysis on the influence of manager's investment inefficiency on the idiosyncratic risks to investors, as well as the improvement on manager's investment efficiency due to accounting conservatism. This paper examines the evidence of the effects on idiosyncratic risks. It is suggested that future studies on manager's investment efficiency can incorporate idiosyncratic risks to explore how manager's decisions affect the risks of investors.

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