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HOW DO EXECUTIVES BENEFIT FROM INVESTMENT EFFICIENCY? INVESTIGATING THE USE OF ACCOUNTING PERFORMANCE-BASED PAY: EVIDENCE FROM INDONESIA

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Abstract:

Background: Investment efficiency is expected to mitigate agency problems in investment decision-making. However, the role of investment efficiency in accounting performance-based pay is less well-known.
Purpose: This study investigates the moderating effects of investment efficiency on the nexus between accounting performance and executive compensation, which is termed accounting performance-based pay. We predict that executives at firms with more investment efficiency will receive a higher accounting performance-based pay.
Design/methodology/approach: This study uses a sample comprising 888 firm-year observations of non-financial companies listed on the Indonesian Stock Exchange (IDX) from 2010 to 2018.
Finding/result: Using the level of investment efficiency and executive cash compensation as measures, we find that executive accounting performance-based pay significantly increases in investment-efficient firms. We also find that the association between investment efficiency and accounting pay-for-performance sensitivity is consistent with a robustness check using a different measure of investment efficiency.
Conclusion: Our findings suggest that Indonesian firms generally incorporate relative investment efficiency when designing executive compensation contracts.
Originality/value (state of the art): This study fills an important gap in the literature on the role of investment efficiency and the use of accounting performance-based pay to address empirical evidence of the incentive alignment effect of strategic decision-making.

Keywords: accounting performance-based pay, efficient use of resources, executive compensation, investment, investment efficiency

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INTRODUCTION

This study investigates whether the quality of investment decision-making determines executive accounting performance-based pay and, if so, how it does this. The quality of investment decision-making can be reflected in corporate investment efficiency. Investment efficiency is an essential means by which managers make decisions that involve considerable financial resources to anticipate future firm performance and thus increase shareholder wealth (Yu, 2018; Khurana et al. 2018; Tunyi et al. 2019; Xu et al. 2020; Quah et al. 2020). However, the role of investment efficiency in accounting performance-based pay is less well-known. The significance of investment efficiency in the accounting performance-based pay of executives has been explained theoretically using agency theory. Agency theory proposes a pay-for-performance mechanism to align the interests of managers and shareholders. Compensation contracts can play a role in reducing agency problems in investment decision making (Qu et al. 2021). However, compensation contracts are sometimes not aligned with performance due to high managerial power (Ghrab et al. 2022); therefore, other mechanisms, such as investment efficiency, are needed to align the interests of managers and shareholders. An incentive scheme that is aligned with investment efficiency motivates managers to invest in projects with positive net present value (NPV). Managers can increase shareholder wealth by returning excess cash from investment decision-making to shareholders. Investment efficiency is expected to produce profitable projects and can increase firm value (Chen and Lin, 2013) and the cost of equity (Majeed et al. 2018) to fulfill shareholder expectation. However, there is little empirical evidence regarding the effect of investment efficiency on accounting performance-based pay.

High executive compensation's purpose is to attract and retain highly skilled executives, but it creates a collective problem for institutional investors in the future (Pepper, 2022). Previous studies have explained that executive compensation is usually designed to meet performance targets. Kim and Jang (2020) studied the restaurant industry and suggested that compensation enhances firm performance. In a related study, Zoghlami (2021) found that compensation improved the accounting performance of a French firm. Conversely, some studies have explained that executive compensation does not have a relationship with performance (Ghran et al. 2022; Usman et al. 2019). Therefore, the effectiveness of accounting performance-based pay needs to be explored in investment decision making. The impact of investment decision-making carried out to meet specific performance goals has been investigated by Chen et al. (2016). Their study found that investment decision-making is positively correlated with accounting pay-for-performance sensitivity. However, a previous study only investigated investment intensity and the sensitivity of accounting performance-based pay without focusing on efficient use of financial resources during corporate investment decision-making. This limitation is an empirical question that we focus on in this study.

To fill this research gap and test the efficient use of financial resources in corporate investment decision-making, we use investment efficiency as a proxy. We examine the relationship between investment efficiency and pay-for-performance in accounting. We also study this in a unique setting, namely Indonesia, where executive compensation schemes have the potential to lead to accounting fraud (Soepriyanto et al. 2022) and where mechanisms are needed to fulfill shareholder expectations (Farid et al. 2011), such as investment efficiency. We use hand-collected data from the Indonesia Capital Market (IDX) in a country that lags behind other ASEAN countries in executive compensation disclosure (Wahyuni et al. 2020). To test the effect of investment efficiency on the relationship between firm performance and executive compensation, this research uses a quantitative approach through ordinary least squares (OLS) regression analysis with control for year fixed effects, which is termed the least square dummy variable (LSDV) as a baseline for testing the hypothesis. We use a base sample of 888 firm-year observations from 2010 to 2018 to estimate the pay-for-performance model from previous studies (Jensen and Murphy, 1990; Chen et al. 2016). To the best of our knowledge, no study has investigated the beneficial effect of investment efficiency on pay-for-performance sensitivity. It is important because investment decision-making can be strategic when managers use many financial resources, and long-term returns must align with shareholder interests. We explore how the relationship between short-term accounting performance and executive compensation is affected by investment efficiency.

This study focuses on how investment efficiency as manifested in efficient use of financial resources in investment decision-making moderates the nexus between accounting performance and executive compensation, termed as the accounting performance-based pay. Our focus is motivated by several factors. First, there is growing interest in research on investment efficiency that focuses more on the determinants of investment efficiency. The consequences for managers (as the decision-maker) of decisions that lead to investment efficiency are limited. Second, as discussed in the extant literature, the consequences of investment efficiency in Indonesian companies are related to corporate governance effectiveness under a unique board structure (Harymawan et al. 2020), which has a potential effect on a system of accounting performance-based compensation in contract design. As discussed in the existing literature, a pay-for-performance compensation scheme can align manager's and shareholder interests (Nicholas, 2020).

We find that investment efficiency is positively related to accounting performance-based pay, which is consistent with the hypothesis (H1). Firms with high investment efficiency offer higher pay for performance. The other result from testing the control variable suggests that accounting performance is more pronounced in Indonesian companies. There is no evidence that other compensation contract schemes, such as pay size and firm-stock performance, have been used by Indonesian companies. The overall result of this study implies an argument to advocate the role of investment efficiency in improving the relationship between performance and executive compensation in Indonesian companies.
We contribute to the extant literature in the following ways. First, we empirically demonstrate the role of investment decision-making quality using the effect of investment efficiency on accounting pay-for-performance sensitivity. Second, this study has regulatory implications, particularly for an accounting performance-based compensation mechanism in contracts with Indonesian companies. Three, this study fills the gap in the literature by examining how compensation contract design is structured by firm investment efficiency. Finally, this study provides new evidence for studying the moderating effect of investment efficiency as the quality of corporate investment decision-making on pay-for-performance sensitivity. Existing studies reveal that effect investment efficiency has a beneficial impact on firms, but their effect on accounting performance-based pay is often omitted. Therefore, we use a quantitative approach through ordinary least squares (OLS) regression analysis with control for year fixed effects to control for economic conditions, which is termed the least square dummy variable (LSDV). This study also uses a robustness test with an alternative measure of investment efficiency to address the problem of endogeneity from measurement error.

METHODS

We obtained our data from annual reports and financial statements from Indonesia's capital markets. The population of this study are all non-financial companies listed on the Indonesia Stock Exchange from 2010 to 2018. We chose this sample period, starting in 2010, to control for the existence of changes in the role of governing mechanisms after the global financial crisis (Chow, 2021). The observation period in 2019, the last year before the effect of COVID-19 pandemic, regarding firms' financial reporting timeliness where Indonesia Stock Exchange (IDX) authority was released by regulation No.:Peng-LK-00005/BEI. PP1/07-2020 to give a relaxation of the deadline for submitting financial statements for a listed company, which may have influenced the firm financial reporting timeline that impacted firm-level investment decision-making and firm investment efficiency (Liu et al. 2021). We excluded financial firms that had unique characteristics in investment decision-making. Firms without complete data for analysis in this study were also excluded from the sample. Based on these criteria, our final sample comprises 888 firm-year observations from 112 individual firms.

Table 1 presents firm distribution by the end of each year and industry. As shown in panel A, we found that 402 firm-years in our sample are under-investment firms suggesting that investment in Indonesian companies exhibit an under-investment condition and this indicates that investment efficiency in Indonesian companies is weaker (Gao et al. 2017). Higher efficiency is seen in our sample in 2011 when Indonesia began implementing the IFRS standard that required more accurate and consistent disclosure of firm investment (such as IAS 16, IAS 28, IAS 38 and IFRS 3), indicated that adopting IFRS can have an effect on firm investment efficiency (Gao and Sidhu, 2018).

Table 1. Sample distribution among firm investment efficiency

Year	Under-invest	Over-invest	Efficient	Total
2010	48	26	21	95
2011	41	24	31	96
2012	43	34	21	98
2013	46	27	25	98
2014	48	34	20	102
2015	44	28	29	101
2016	44	25	30	99
2017	41	34	22	97
2018	47	32	23	102
Total	402	264	222	888

Investment efficiency is the optimal level in investment expenditure under a scenario without agency cost (Biddle et al. 2009). This study uses the investment efficiency model that was proposed by Richardson (2006) and modified by He et al. (2019), where investment efficiency as unexpected investment is measured using a residual value between total investment and expected investment using not only investment in the new project but also the total investment of the firm. The expected investment formula is as follows:

$$INV_{i,t} = \alpha + \beta_0 Q_{i,t-1} + \beta_1 CASH_{i,t-1} + \beta_2 LEV_{i,t-1} + \beta_3 RET_{i,t} + \beta_4 AGE_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 INV_{i,t} + \varepsilon_{i,t} \quad \text{..... (1)}$$

Where INVi,t is total investment for firm i at time t, consisting of the sum of fixed assets, construction in process, intangible assets, and long-term investments, all scaled by total assets (He et al. 2019); Qi,t-1 is Tobin's Q as growth opportunity; CASHi,t-1 is cash and equivalent and short term-investment; LEVi,t-1 is financial leverage; RETi,t-1 is earning per share for the year before the investment year; AGEi,t-1 is firm age since being listed company; SIZEi,t-1 is the natural logarithm of total assets of the previous year; INVi,t-1. In this model, we include industry and year as dummy variables. In testing our hypothesis, we use the absolute value of the residual term of equation (1), AbsInvi,t, to measure the investment efficiency. Absolute value is intended to correspond to a residual value that has negative (positive) value with under (over) investment is undesirable. A large (small) absolute value of residual represents a less (more) efficient investment.

According to agency theory, the alignment of executive compensation with firm performance has the potential to resolve agency issues (Core et al. 1999; Basu et al. 2007; Cheng et al. 2015). Conversely, managers may augment their incentives by manipulating their investment decisions to optimize their utility. In order to increase their power and capitalize on privileges, managers may make investment decisions that lead to overinvestment, thereby increasing the size of their investments beyond the optimal level (Aggarwal and Samwick, 2006; Yermack, 2006; Blanes et al. 2020). Therefore, we can address investment efficiency to control managerial behavior (Majeed et al. 2018) and mitigate agency problems. In order to mitigate agency issues associated with investment decision-making, it is imperative to establish an appropriate compensation contract scheme. The positive impacts of executive compensation on accounting irregularities in Indonesian companies suggest a lower efficacy of governance (Soepriyanto et al. 2022). Therefore, the board has been responsible for managing executive compensation in Indonesian companies (Harymawan et al. 2020). We may recommend performance-based pay as a compensation strategy to address principal-agent issues.

H1: Investment efficiency has moderating impact on the nexus between accounting performance and executive compensation.

To test our hypothesis, we proposed the model in Figure 1, which is to regress the changes in accounting performance (ROA) in terms of change in executive compensation as pay-for-performance sensitivity (Jensen and Murphy, 1990; Chen et al. 2016; Koo, 2022). We also include an interaction term between investment efficiency (unexpected investment) and accounting performance (ROA) to examine the effect of investment efficiency on accounting pay-for-performance sensitivity. We use the following model:

$$dTotCOM = \alpha + \beta_0 dROA + \beta_1 AbsInv + \beta_2 ROA*AbsInv + \beta_3 SIZE + \beta 4LS + \beta_5 MLEV + \varepsilon_{i,t} \quad \text{.... (2)}$$

Where: dTotCOM = change in the logarithm of total compensation from the previous year; dROA = change in ROA from the previous year; AbsInv = absolute value unexpected investment; SIZE = the natural logarithm of the total assets; LS = stock liquidity; MLEV = market leverage; in the above model, we also control for year fixed effect by including year dummies. To test the moderating effects of investment efficiency on the nexus between firm performance and executive compensation, this research uses a quantitative approach through ordinary least squares (OLS) regression analysis with control for year fixed effects, which is termed the least square dummy variable (LSDV).

The dependent variable in this research is the change in logarithm of total remuneration from the previous year (dTotCOM). We use the cash compensation of the board in a firm as a proxy for executive compensation. The boards in Indonesian listed firms consist of a board of directors (BoD) and a board of commissioners (BoC) because Indonesia uses a two-tier board structure (Harymawan, 2018). Cash compensation is more useful as a proxy for executive compensation because equity-based compensation is rarely used by listed firms in Indonesia during our sample period. We measure executive compensation by taking the natural logarithm of the total salary and short-term incentive earned by the board of directors. The test variable in this research is AbsInv, which is the absolute value of the unexpected investment. We use change in return on assets (dROA) compared to the previous year as a performance proxy to test accounting performance-based pay using the relationship between performance and executive compensation. The control variable in this study consists of 1) size, measured as a natural logarithm of total assets; 2) stock liquidity, trading volume/(trading days*outstanding stock), and 3) market leverage, total debt/ market value of assets.

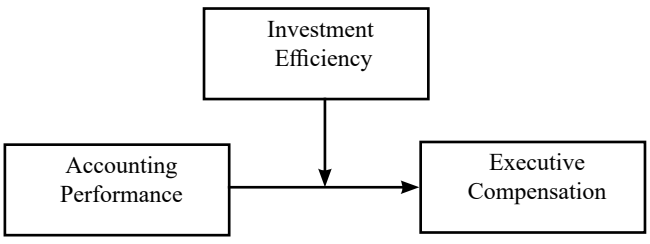

Figure 1. Research framework

RESULTS

Descriptive Statistics

Table 2 shows the descriptive statistics in our sample. The mean value of dTotCOM is 0.099 which indicates that mean compensation increases every year. The median value of dTotCOM, 0.0754, is much smaller than the mean value suggesting that dTotCOM is highly positively skewed. The mean value of increasing ROA from the previous year is 0.0002, which indicates that financial performance has growth. The mean investment efficiency, using an unexpected investment measure of 0.15, is more than the median value which means that many samples have inefficient investment conditions. Regarding the control variable, the average size (total assets) is 28.40, and the stock liquidity of the sample firm is positively skewed. The mean market leverage is 45.7 percent.

Table 3 provides Pearson Correlation analysis as a univariate test. Based on Table 3, we find a significant positive relationship between dROA and dTotCOM (p= 0.0000). This result confirms that the relationship between accounting performance and executive pay (accounting performance-based pay) is consistent. We document other positive relationships, for instance, LS. Table 4 provides the result of hypothesis testing. The testing in this study uses OLS regression with a fixed year to control economic conditions. In this study, the effect of the interaction between the investment inefficiency variable (AbsInv) and the change in accounting performance variable (dROA) on board compensation was examined to find the effect of investment efficiency on the accounting pay-for-performance sensitivity. We found a significant negative relationship between the interaction term dROA*AbsInv and change in board compensation (dTotCOM). The coefficient for the interaction term is -1.520 and is significant at a level of 10%. The effect of investment inefficiency (AbsInv) on change in board compensation (dTotCOM) is insignificant, indicating this test pure moderator.

In addition, the results from the controlling variable reveal that size, stock liquidity, and market leverage are not significant. The insignificant relationship between size and TotCOM is consistent with Hill et al. (2016). This result indicates no evidence of excess CEO compensation in Indonesian companies. Unlike

previous studies like Wijaya et al. (2023), executives in Indonesia receive more compensation based on accounting performance than company size. The insignificant relationship between stock liquidity and market leverage on TotCOM is different from Nickerson (2017) and consistent with Firth et el. (1999). Market performance was not driven by executive compensation, and this indicates that capital market performance is not fully considered as a compensation scheme in contracts in Indonesian companies.

Table 2. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Median	Min	Max
dTotCOM	888	0.0999	0.3280	0.0754	-2.5538	4.0684
dROA	888	0.0002	0.1305	-0.0008	-0.8936	2.4954
AbsInv	888	0.1458	0.2501	0.1150	0.0003	5.4170
dROA* AbsInv	888	-0.0007	0.0192	-0.0000	-0.2993	0.1510
SIZE	888	28.4038	1.5832	28.3144	24.4748	32.2010
LS	888	0.0014	0.0028	0.0004	0.0000	0.0340
MLEV	888	0.4570	0.2900	0.4297	0.0029	2.7853

Table 3. Pearson correlations

	dTotCOM	dROA	AbsInv	SIZE	LS
dROA	0.2994***				
	(0.0000)				
AbsInv	-0.0297	-0.0217			
	(0.3773)	(0.5184)			
SIZE	0.0088	-0.0155	-0.0164		
	(0.7931)	(0.6449)	(0.6258)		
LS	0.0775**	-0.0145	-0.0158	0.1877***	
	(0.0209)	(0.6661)	(0.6385)	(0.0000)	
MLEV	-0.0285	0.0028	0.0356	-0.0347	0.0462
	(0.3969)	(0.9332)	(0.289)	(0.3022)	(0.1686)

Table 4. The result of regression on investment efficiency and executive compensation

Dependent variable: dTotCOM	Coef.
dROA	0.891*** (8.680)
AbsInv	-0.060 (-1.360)
dROA* AbsInv	-1.520* (-2.100)
SIZE	0.004 (0.610)
LS	6.205 (1.590)
MLEV	-0.033 (-0.880)
Cons	0.026 (0.130)
Year fixed effect = Yes	
Number of obs = 888	
F = 8.21	
Adj R-squared = 0.1022	

Note(s): This table consists of the results of OLS regression for hypothesis test. t statistics in parentheses indicate *p<0.1; **p <0.05; ***p < 0.01

Prior studies have documented an association between executive compensation and firm investment. Firms with more investment opportunities should have greater compensation-performance relationships (Baber et al. 1996). To encourage firm innovation using R&D investment, a firm should pay more incentives (Chen et al. 2016). However, managers may exhibit myopic behaviors (Lai and Liu, 2018). When the managers make decisions about investment, they may have their own set of interests. Managers may seek more compensation for their investment decision-making for a firm beyond optimal investment size (Eisdorfer et al. 2013). Extending previous study, this study demonstrates that accounting performance-based pay is less common where there is investment inefficiency than it is in firms with investment efficiency. The effect of investment efficiency will be to increase accounting performance-based pay.

The result also confirms with classical agency theory that linking executive compensation to firm performance could alleviate agency problems (Core et al. 1999; Basu et al. 2007; Cheng et al. 2015). However, managers can increase their incentives in another way: by distorting their investment decision to maximize their utility. In their decision-making, managers should invest in projects with positive net present value (NPV). They should increase shareholder wealth by return as marginal benefit exceeds investment to shareholders from investment decision-making (Biddle et al. 2009). Investment efficiency is expected to lead to profitable projects and increase a firm's financial performance. However, various frictions and forces such as managerial distortion may affect a firm's investment efficiency.

This result is in line with the finding of a previous study that firms should pay more incentives when making investment decisions (Chen et al. 2016). Managers may take advantage of an opportunity in investment decision-making to over-invest in negative net present value (NPV) projects to develop their companies beyond their optimal size. Managers can make investment decisions that result in over-investment which is used to expand their investments beyond the optimal size in order to gain power and benefit from perquisites (Aggarwal and Samwick, 2006; Yermack, 2006; Blanes et al. 2020). Inefficiency in investment decision-making can also be caused by avoiding risky projects with optimal investment return (Jeon, 1998; Bianco et al. 2013; Cheng et al. 2013; Habib et al. 2018; Li et al. 2019; Salehi et al. 2020) in the interests of their career (Wan et al. 2015; Xie, 2015; Aulia and Siregar, 2018; Cirillo et al. 2019) and for their own personal gain (Grundy and Li, 2010). Hence, investment efficiency can be addressed by controlling managerial behavior (Majeed et al. 2018) and mitigate agency problems.

An appropriate compensation contract scheme must be designed to alleviate agency problems with regard to investment decision-making. The positive impacts of executive compensation on accounting irregularities in Indonesian companies (Soepriyanto et al. 2022) indicate lower effectiveness of governance. Hence, executive compensation in Indonesian companies has been managed by the board (Harymawan et al. 2020). Performance-based pay can be suggested as a compensation scheme for mitigating principal-agent problems. A compensation scheme can control managerial decision-making (Sisaye, 2005). The agency theory proposes that an optimal contract correlates between firm performance and executive compensation to align manager's and shareholder interests. This study reveals that changes in accounting performance variables (measured by returns on assets) on board compensation, which is termed accounting performance-based pay, exhibit more in firms with more efficient investments. Linking investment efficiency to an appropriate compensation scheme in a contract alleviates the friction of agency problems. This study implies an argument to advocate the role of investment efficiency in improving the relationship between performance and executive compensation in Indonesian companies to reduce agency problems in managerial decision-making.

Robustness Test

A robustness test was conducted with respect to alternative measures on investment efficiency. An alternative measure of investment efficiency was used to eliminate the possibility that our main result was driven by the measure that we use. The robustness test in this study replaced unexpected investment (AbsInv) with another measure of investment efficiency (INEV_Lag1). We used the INEV_Lag1 measure by Biddle et al. (2009) model described below:

$$INV_{i,t} = \alpha + \beta_0 SalesGrowth_{i,t-1} + \varepsilon_{i,t} \quad .... (3)$$

Where the INV is the total investment and sales growth is the percentage change of sales from the previous year. The investment efficiency is measured as the residual from equation (3).

Table 5 shows the result of the robustness test. INEV_ Lag1 is investment efficiency from the previous year. Under the different measures, we finally had 873 firm-year observations. Supporting the findings of the main sample, we found that the effect of the interaction variable on board compensation is negative and statistically significant. The coefficient of the interaction term (dROA * INEV_Lag1) is significantly negative at the 1 per cent level (Coeff. -0.0003; t-stat. -5.29).

Managerial Implications

Our study has important practical implications as a firm in design contract. A design contract that aligns managers' and shareholders' interests can be achieved using the pay-for-performance mechanism. However, implementation of the pay-for-performance mechanism in design contracts faces challenges. Therefore, efficient investment in corporate investment decision-making can be another mechanism to align managers' and shareholders' interests. Supporting this mechanism can effectively improve pay-form performance.

Firms can now manage to improve their short- and long-term performance. This performance improvement can be achieved using efficient resources during corporate decision-making. Efficiency investment in Indonesian companies must be improved because investment efficiency in Indonesian companies is weaker (Gao et al. 2017). The effort to improve investment efficiency can be benefit not only to firm performance but also improves the executive compensation.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This research took advantage of Indonesia's particular context to examine the influence of investment efficiency on pay-for-performance sensitivity. As we developed the testing of theory, we examined the link between firm investment efficiency and accounting performance-based pay. We documented the robustness of the results supporting the main idea that decision-making leading to efficient investment by management is found in firms that exhibit a higher level of accounting pay-for-performance sensitivity. An additional result from the control variable provides evidence that firm size and market performance (stock liquidity and market leverage) are not significant factors in executive compensation schemes in design contracts for Indonesian-listed firms. In general, these findings indicate that the agency theory argument in favor of the incentive-alignment effect of investment efficiency plays a significant role, ultimately affecting the pay-for-performance compensation schemes in the Indonesian context.

Table 5. The result of regression on investment efficiency and executive compensation for alternative

Dependent variable: dTotCOM	Coef.
dROA	0.8201*** (10.1900)
INEF_Lag1	0.0000 (0.8400)
dROA*INEV_Lag1	-0.0003*** (-5.290)
SIZE	0.0039 (0.590)
LS	6.0352 (1.570)
MLEV	-0.0250 (-0.6800)
Cons	0.0194136 (0.1)
Year fixed effect = Yes	
Number of obs = 873	
F = 9.98	
Adj R-squared = 0.1260	

Note(s): This table consists of result OLS regression for hypothesis test. t statistics in parentheses indicate *p<0.1; **p <0.05; ***p < 0.01

Recommendations

Our study has several limitations that should be considered in future research. First, the role of firm investment efficiency in pay-for-accounting performance can be tested in cross-country settings. Second, future research could use another proxy to estimate unexpected investments. Finally, future research could add another compensation scheme to compare investment efficiency consistency in different executive incentives.

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