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RESEARCH ARTICLE

Equity incentives and firm performance: The mediating role of investment efficiency under executives' political identity

Zhao Zeyi, Junainah Jaidi*, Debbra Toria Nipo

Faculty of Business, Economics and Accountancy, Universiti Malaysia Sabah, 88400, Kota Kinabalu, Sabah, Malaysia

*** Corresponding author:** Junainah Jaidi, nenjaidi@ums.edu.my

ABSTRACT

Investment inefficiency remains a critical obstacle to firm performance in China, raising questions about how managerial incentives and political identity shape executive decision-making. Agency, expectancy, and social identity theories jointly suggest that equity incentives may align managerial and shareholder interests, encourage prudent investment decisions via effort–reward considerations, and that executives' political identity may reinforce long-term oriented investment behaviour. Building on these theories, this study examines how equity incentives influence firm performance through investment efficiency, and how executives' political identity moderates this relationship. Using a panel dataset of Chinese listed firms, the empirical results show that equity incentives improve firm performance by approximately 8%, with investment efficiency functioning as a key mediating channel. In addition, executives' political identity, as reflected by Communist Party membership of China, positively moderates this relationship, further reinforcing the effectiveness of equity incentives. Overall, the findings highlight investment efficiency as a behavioural mechanism linking equity incentives to firm performance, demonstrate the reinforcing role of executives' political identity, and contribute to governance research by integrating psychological insights while offering practical guidance for designing effective managerial incentive schemes in emerging markets.

Keywords: Equity Incentives; Investment Behaviour; Firm Outcomes; Political Affiliation; Agency Theory; Expectancy Theory; Social Identity Theory

1. Introduction

Since China's reform and opening-up, corporate investment has experienced more than three decades of rapid expansion. However, this persistent growth has not consistently translated into value creation for firms; instead, widespread inefficiencies in capital allocation have often eroded firm performance [1]. For firms seeking sustainable development, managerial decision-making on major investments is crucial, as the quality of these decisions directly shapes investment efficiency and thereby influences long-term competitiveness. Moreover, the efficiency of corporate investment has been shown to significantly influence not only firm performance but also broader economic outcomes [2]. Taken together, these observations underscore the importance of examining the determinants of inefficient investment behaviour and identifying mechanisms that can align managerial decisions with organizational performance objectives.

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Building on the agent theory, managerial investment decisions may deviate from the firm's best interests when guided by personal motives, leading to inefficient allocation of resources [3]. Improving investment efficiency therefore requires not only constraining opportunistic behaviour but also ensuring that managerial incentives are aligned with long-term corporate goals. Equity incentive schemes serve this purpose by mitigating agency problems and linking executive wealth to organizational outcomes. From a behavioural perspective, expectancy theory suggests that such incentives strengthen the perceived connection between effort, performance, and rewards, motivating managers to make decisions that enhance investment efficiency. To institutionalize these mechanisms, the China Securities Regulatory Commission issued the Administrative Measures for Equity Incentives of Listed Companies in 2016. Unlike Western systems, the Chinese equity incentive framework imposes mandatory performance-based restrictions on both targets and exercise timelines, reflecting the country's distinctive approach to linking managerial incentives with accountability [4].

Additionally, within China's unique political context, some executives or directors of listed companies also hold membership in the Communist Party of China (CPC). This membership not only represents a formal political background but also shapes executives' political identity. According to social identity theory, CPC-affiliated executives internalize their political identity, which reinforces alignment with collective goals and curbs self-serving behaviour. Such CPC-affiliated executives are often considered proponents of collectivist principles and are more likely to integrate Party values with corporate strategies, prioritizing environmental protection, social responsibility, and stakeholder welfare [5-7]. Party discipline further serves as an institutional safeguard against corruption, reducing opportunistic managerial behaviours that could undermine investment efficiency. Consequently, CPC membership can improve managerial decision-making by aligning actions with collective corporate interests, thereby enhancing investment efficiency and ultimately strengthening firm performance, as supported by empirical evidence [8]. In this way, political identity complements equity incentives, reinforcing managerial alignment with corporate goals and strengthening the mechanism through which improved investment efficiency translates into superior firm performance.

Building on the discussion above, this study develops an integrated theoretical framework combining agent theory, expectancy theory, and social identity theory. Equity incentives are expected to align managerial and shareholder interests, thereby improving investment efficiency and ultimately enhancing firm performance. However, the effectiveness of equity incentives may vary depending on contextual factors, particularly executives' political identity. CPC-affiliated executives, guided by both institutional constraints and their value-driven identification with the Party, are more inclined to prioritize long-term collective goals over short-term personal interests, influencing the degree of inefficient investment.

Accordingly, to address the gaps identified above, this study formulates the following research questions within the context of China's unique economic and political environment: (1) How do equity incentives affect inefficient investment? (2) What role does inefficient investment play in mediating the relationship between equity incentives and firm performance? (3) To what extent do executives' political identity moderate the impact of equity incentives on inefficient investment behaviours?

2. Literature review and hypothesis development

2.1. Equity incentive and firm performance

Equity incentives are recognized as an effective mechanism to align managerial and shareholder interests in China, mitigating agency conflicts and discouraging opportunistic managerial behaviours [9-10].

Building on agency theory [11], equity incentives link managerial wealth to firm performance, constraining self-serving behaviour and guiding resource allocation toward value-enhancing projects. By explicitly tying rewards to outcomes, these incentives also shape managers' perceptions of the effort-reward relationship, as highlighted by expectancy theory [12], thereby motivating them to make prudent investment decisions. In this way, the structural alignment emphasized by agency theory and the motivational mechanism emphasized by expectancy theory operate jointly, providing a comprehensive explanation of how equity incentives improve investment efficiency and, ultimately, firm performance.

The relationship between equity incentives and firm performance has been extensively examined in China, yet the findings remain mixed. Some studies reported a positive correlation, arguing that equity ownership aligns executives' interests with organizational goals and thereby enhances firm performance [6, 9, 13-15]. Other research, however, found no significant association, suggesting that equity incentives do not automatically lead to improved outcomes [16]. Moreover, several scholars identified an inverted U-shaped relationship, indicating that performance improvements occur only up to a certain level of incentives, beyond which additional incentives may diminish or even reverse the benefits [17].

Beyond these general findings, scholars have explored factors that condition the effectiveness of equity incentives. Gao et al. [18] demonstrated that such incentives could encourage risk-taking behaviours, particularly when investor ownership was relatively low, which in turn shaped performance outcomes. Similarly, Qiao et al. [4], drawing on 1,695 equity incentive plans implemented by Chinese listed firms between 2010 and 2018, found that plan validity had a positive effect on performance, whereas excessive incentive intensity could be counterproductive, highlighting the importance of careful plan design.

Taken together, these Chinese empirical studies indicate that well-structured equity incentive schemes generally enhance firm performance, lending support to the argument that managerial interests can be effectively aligned with shareholder objectives through appropriately designed incentives. Accordingly, the first hypothesis of this study is proposed as follows:

H1: Equity incentives have a positive relationship with firm performance.

2.2. Mediating role of investment efficiency

Investment efficiency represents the extent to which corporate resources are allocated to value-enhancing projects rather than wasted on overinvestment or constrained by underinvestment. From the perspective of agency theory [11], managers may pursue personal benefits over shareholder interests, leading to overinvestment or underinvestment. Equity incentives mitigate these agency problems by linking managerial wealth to firm outcomes, constraining opportunistic behaviour. Complementing this structural mechanism, expectancy theory [12] emphasizes the psychological channel: when managers perceive a clear connection between effort, performance, and rewards, they are motivated to make prudent and efficient investment decisions. Together, these theories provide a unified explanation: equity incentives not only restrain self-serving behaviour but also actively encourage resource allocation toward value-enhancing projects, making investment efficiency a key mediating mechanism through which managerial incentives translate into improved firm performance.

In China, listed companies generally implemented performance-driven equity incentive systems, whereby managerial gains were tied to corporate earnings growth, creating a strong incentive to allocate resources efficiently and improve investment outcomes [4]. This institutional design strengthens the alignment between managerial actions and firm objectives, providing a structured mechanism through which investment efficiency can be improved.

Empirical studies in China provide mixed but mostly supportive evidence for the positive effect of equity incentives on investment efficiency. Liu and Jiang [19], using financial data from Chinese listed companies between 2007 and 2017, found that executive investment power incentives positively influenced investment efficiency, while mitigating the effects of internal pay disparity among executives. However, some studies highlighted potential limitations. Liu [20] found a nuanced relationship: equity incentives were negatively associated with overinvestment but positively associated with underinvestment, with varying effects observed in Growth Enterprise Market companies.

Furthermore, investment efficiency also plays a crucial role in shaping firm performance. Efficient investment ensures that corporate resources are directed toward value-enhancing projects, thereby improving profitability and sustaining long-term firm value [21-22]. In contrast, inefficient investment, whether through overinvestment or underinvestment, can distort resource allocation and undermine performance outcomes. Accordingly, investment efficiency can be regarded as a key mechanism through which equity incentives influence firm performance.

Based on these findings, the study proposes the following hypotheses:

H2: Equity incentives have a positive relationship with investment efficiency.

H3: Investment efficiency mediates the relationship between equity incentives and firm performance.

2.3. Executive political background

In recent years, most Chinese listed companies have established Party organizations, as mandated by the Party Constitution, which requires companies with three or more Party members to form such organizations. These organizations conduct legal and routine activities, such as organizing events, holding meetings, and carrying out commendations and support initiatives. Through activities such as participating in corporate decision-making, supervising investment and operational plans, organizing events and meetings, performing commendations, and providing guidance or support, Party organizations enhance governance oversight and encourage collective, socially responsible decision-making, thereby constraining managerial opportunism [23-24]. From a theoretical perspective, this aligns with agency theory [11], as such institutional mechanisms help curb self-serving behaviour and align managerial actions with organizational objectives.

From a psychological perspective, social identity theory [25] suggests that individuals who strongly identify with a group tend to internalize its norms and values, which in turn guide their behaviour in line with collective goals. In the context of Chinese listed companies, executives who are CPC members can internalize their political identity through prolonged social learning, integrating core Party values such as "serving the people," "altruism," and "social contribution" into their personal ideologies [26]. Such internalization may influence investment choices, making executives more inclined to pursue projects aligned with long-term corporate sustainability rather than short-term personal gains.

Prior empirical studies highlight three main mechanisms through which CPC affiliation enhances investment efficiency: direct control, discipline constraints, and governance supervision. Li et al. [27] show that direct CPC control, such as appointing CPC members as directors, supervisors, or senior executives, significantly improves investment efficiency, particularly by restraining overinvestment in SOEs. Wang [28] finds that CPC discipline constraints affect investment behaviour by mitigating certain inefficiencies, although their impacts differ between overinvestment and underinvestment contexts. Furthermore, Cheng and Li [29] demonstrate that Party organizations strengthen investment efficiency by performing advisory and supervisory roles within corporate governance. Taken together, these findings suggest that CPC affiliation

functions as both an institutional and behavioural mechanism that fosters long-term oriented decision-making and strengthens alignment with firm-wide goals.

Based on the above findings, the fourth hypothesis of this study is proposed:

H4: Executive membership in the CPC has a positive relationship with investment efficiency.

3. Methodology

3.1. Data

The data employed in this study were drawn from the China Stock Market Accounting Research (CSMAR) database, which provides comprehensive financial and governance information on Chinese listed firms. The sample covers the period from January 1, 2017 to December 31, 2022. To ensure data validity and consistency, we excluded listed companies that met any of the following criteria: (1) operating in the finance or insurance sectors; (2) classified as ST, ST, or PT during the sample period; (3) issuing B shares or H shares; (4) undergoing major asset restructuring during the implementation of the equity incentive plan; or (5) implementing equity incentives for less than two years or having missing data.

Excel 2019 is used for preliminary data processing and organization, while STATA 17 is employed for empirical analysis. All continuous variables underwent a winsorization process at the 1% and 99% levels to mitigate the impact of outliers on research conclusions. Consequently, a final unbalanced panel dataset comprising 1343 firm-year observations is obtained.

3.2. Variables measurement

3.2.1. Equity incentives

Equity incentives are compensation schemes that provide executives with ownership stakes in the firm, typically in the form of stock options or restricted shares, to align their interests with those of shareholders and motivate them to enhance firm value [30]. Since this study focuses on firms that have already implemented incentive plans, a continuous measure of incentive intensity is used rather than a binary indicator.

In China, performance-based equity incentives usually feature phased vesting schedules and expiration periods, motivating managers to consider both current and future exercisable incentives in their decision-making. Following Wang and Huang [31], Gong [32], and Sun [33], the intensity of equity incentives is measured as the total number of outstanding and effective stock options and restricted shares, expressed as a percentage of the firm's total equity.

3.2.2. Investment efficiency

Investment efficiency reflects the extent to which corporate resources are allocated to value-enhancing projects rather than wasted through overinvestment or constrained by underinvestment. While the Richardson model [34] is widely used in prior research [35], it may be unsuitable in certain theoretical contexts, as it could fail to capture overinvestment accurately or produce results inconsistent with actual investment efficiency [36].

To address these limitations, and following Mao and Guan [37], this study employs the Biddle regression model [38] as the primary measure of investment efficiency. Compared with the Richardson model [34], the Biddle regression model [38] more effectively distinguishes between overinvestment and underinvestment, accounts for firm-specific characteristics, and provides a more robust and accurate assessment of actual

investment efficiency. This measure is constructed as a negative-phase indicator, where larger values indicate lower investment efficiency.

3.2.3. Firm performance

Firm performance reflects the overall evaluation of a firm's operational outcomes. Prior research has employed a variety of indicators to measure firm performance, such as return on assets (ROA) [9, 39-40], return on equity (ROE) [41-42], return on operating margin (ROM) [4], and the market-to-book ratio (MBV) [43].

Among these, ROA is particularly informative because it links net profit to total assets, thereby integrating profitability with firm size. Total assets, as the denominator, indicate the scale of the firm and provide a useful signal of its growth over time [44]. Net profit, as the numerator, reflects how effectively a firm manages its assets to generate earnings. Importantly, ROA serves as a measure of operating efficiency that is not distorted by differences in capital structure [45]. Accordingly, and in line with prior studies [4], this study employs ROA as the primary measure of firm performance.

3.2.4. Executive political background

In this study, Executive Political Background specifically refers to membership in the CPC, which is a political organization emphasizing collective interests and ethical conduct, is expected to shape executives' decision-making by reducing self-serving behaviours and aligning actions with firm objectives [46-47].

Following prior research [48-50], a dummy variable is constructed to capture CPC membership. If the chairman, CEO, and CFO all hold CPC membership, the variable is assigned a value of 1. If one or two of these executives are CPC members, the variable is also assigned a value of 1. If none of the three executives are CPC members, the variable is assigned a value of 0.

3.2.5. Control variable

This study plans to use equity concentration, board size, board independence, financial leverage, firm size, free cash flow as control variables. In addition, the Acronym, Definition and Operationalization of the variables are provided in Table 1.

Table 1. Summary of variables

Variables	Acronym	Definition	Operationalization
Equity incentive	EI	The ratio of the number of equity incentives to the total share capital of the company	EI=number of equity incentives/total share capital of the company
Firm performance	ROA	The ratio of net profit to total assets	ROA=Net Income/Total Asset
Investment Efficiency	INVE	The extent of inefficient investment in the firm	The magnitude of the expected investment model residuals
Executive Political Background	CPC	Dummy variables for measuring whether executives have party membership	For executives with party membership, CPC=1, and vice versa CPC=0
Equity concentration	TOPONE	Percentage of shareholding of the largest shareholder	Percentage of shareholding of the largest shareholder
Board Size	BOARD	Size of the board	Natural logarithm of the number of board members
Tobin's Q	TOBINQ	The ratio of the market value of capital to its replacement cost	Market value of the company/replacement cost of assets
Board independence	IDP	The ratio of independent directors	IDP=Number of Independent

Variables	Acronym	Definition	Operationalization
		to number of directors	Directors / Total Number of Directors
Financial leverage	LEV	The ratio of total liabilities to total assets was selected as the measure.	Levi=Total liabilities/Total assets
Firm size	LNSIZE	Log of total assets	Log of total assets
Free cash flow	FCF	Amount of cash flow freely available to the company	FCF = Net cash flow from operating activities - Expected level of investment

Table 1. (*Continued*)

3.3. Estimation tests

This study employs unbalanced panel data for empirical analysis. Panel data simultaneously consider both cross-sectional and time dimensions, and with a large sample size, it is crucial to first determine the appropriate model form for the panel data. This model effectively addresses issues such as omitted variable bias and multicollinearity, significantly improving estimates precision and estimation efficiency [51].

To identify the most appropriate model, a series of specification tests were conducted, including the F-test, Breusch-Pagan test, and Hausman test. The F-test results ($p < 0.05$) suggest that the fixed effects (FE) model provides a better fit than the ordinary least squares (OLS) model. The Breusch-Pagan test also rejects the OLS model in favour of a panel data specification. Most importantly, the Hausman test ($p < 0.05$) indicates that the FE model is preferable to the random effects (RE) model. Based on these results, this study employs the FE model for all regression analyses, consistent with the methodological approach adopted in prior research [21, 52].

3.4. Model design

In order to test the hypotheses proposed in this study, the following model is constructed to verify and explore the relationship between equity incentive, investment efficiency, CPC and firm performance:

$$FP_{i,t} = \beta_0 + \beta_1 EI_{i,t} + \theta X_{i,t} + k_t + v_k + \eta_{i,t} \quad (1)$$

$$FP_{i,t} = \beta_0 + \beta_1 EI_{i,t} + \beta_2 INVE_{i,t} + \theta X_{i,t} + k_t + v_k + \eta_{i,t} \quad (2)$$

$$Inv.E_{i,t} = \beta_0 + \beta_1 EI_{i,t} + \beta_2 CPC_{i,t} + \theta M_{i,t} + k_t + v_k + \eta_{i,t} \quad (3)$$

Where: i (company number) = 1, ... , N; t (year time) = 1, …T; $INVE_{i,t}$ is the investment efficiency variable, including three cases of inefficient investment, over-investment and under-investment, it should be noted that this study will borrow Biddle regression model [38] to measure investment efficiency, i.e., through the indicator of "inefficient investment" to measure investment efficiency. $EI_{i,t}$ represents the equity incentive intensity or equity incentive level of firm i at time t; $CPC_{i,t}$ is a dummy variable referring to the political background of executives; $CPC_{i,t}$ =1 means executives have Chinese Communist Party membership; $CPC_{i,t}$=0 means executives do not have Chinese Communist Party membership; $X_{i,t}$ represents a set of control variables that affect firm performance; $M_{i,t}$ represents a set of control variables that affect investment efficiency, including free cash flow, TobinQ, years of listing and financial leverage.

4. Results and discussion

4.1. Descriptive analysis

Table 2 reports the descriptive statistics of the variables used in this study. The mean value of firm performance (ROA), the dependent variable, is 0.062 with a minimum of -0.410 and a maximum of 0.445, which is broadly consistent with prior studies on Chinese listed firms. With respect to the independent variables, the mean strength of equity incentives (EI) is 0.056, ranging from 0.000 to 0.389. This level is comparable to prior studies on equity incentives in China, indicating that the sample firms generally grant equity incentives at a moderate intensity.

The mediator variable, investment efficiency (INVE), has a mean of 0.042 with a minimum of 0.000 and a maximum of 0.394. These values fall within the range reported in prior research on Chinese listed firms, suggesting that investment efficiency is measured consistently with existing studies.

For executive political background, proxied by Communist Party of China (CPC) membership, the mean is 0.213. This suggests that approximately 21% of the sampled executives hold CPC membership, which is in line with prior research on the prevalence of political affiliations among executives in Chinese listed firms.

Regarding the control variables, the descriptive statistics indicate that the values of ownership concentration (TOPONE), board size (BOARD), board independence (IDP), leverage (LEV), firm size (LNSIZE), free cash flow (FCF), and Tobin's Q (TOBINQ) all fall within reasonable ranges. These results are broadly consistent with prior studies on Chinese listed firms, suggesting that the sample is representative and appropriate for subsequent regression analysis.

Table 2. Descriptive Statistics

Variable	Mean	Standard Deviation	Min	Max
ROA	0.062	0.057	-0.410	0.445
INVE	0.042	0.049	0.000	0.394
EI	0.056	0.050	0.000	0.389
CPC	0.213	0.409	0.000	1.000
FCF	0.168	1.243	-1.961	36.430
TOBINQ	2.326	1.699	0.000	22.560
TOPONE	29.740	14.440	5.823	82.440
BOARD	2.088	0.180	1.386	2.708
IDP	38.370	5.728	20.000	66.670
LEV	1.220	6.668	-36.310	219.000
LNSIZE	22.420	1.264	19.700	28.610

4.2. Correlation analysis

Table 3 presents the pairwise correlations among the variables. Firm performance (ROA) is significantly and positively correlated with equity incentives (EI) and CPC membership, while it is negatively associated with investment efficiency (INVE).

Among the control variables, free cash flow, Tobin's Q, and ownership concentration are positively correlated with firm performance, whereas board size, board independence, leverage, and firm size show no significant correlations. Overall, these results suggest that firm performance is more closely linked to

incentives, political connections, and ownership structure, while board characteristics and firm size play a limited role.

Table 3. Pairwise Correlation

	ROA	INVE	EI	CPC	FCF	TOBINQ	TOPONE	BOARD	IDP	LEV	LNSIZE
ROA	1										
INVE	-0.067**	1									
EI	0.124***	-0.101***	1								
CPC	0.0190***	-0.184***	-0.093***	1							
FCF	0.069**	0.014	-0.024	-0.044	1						
TOBINQ	0.400***	-0.081***	0.105***	-0.076**	0.049*	1					
TOPONE	0.202***	0.033	-0.128***	0.165***	0.001	-0.063**	1				
BOARD	0.018	-0.022	0.009	0.234***	-0.040	-0.073**	0.010	1			
IDP	0.002	-0.026	0.031	0.039	0.038	-0.034	0.117***	-0.563***	1		
LEV	-0.032	-0.017	0.004	-0.010	0.011	-0.006	0.025	-0.012	0.068**	1	
LNSIZE	-0.007	0.034	0.024	0.355***	-0.111***	-0.126***	0.241***	0.204***	0.125***	0.004	1

Note. ****, **, and * represent null rejection at 1%, 5%, and 10% level of significance, respectively.*

4.3. Multicollinearity test

To assess the validity of the model, a test for multicollinearity was performed using VIF and tolerance (1/VIF), and the results were presented in Table 4.

The multicollinearity check based on VIF revealed a minimum value of 1.01 and a maximum of 1.75, indicating acceptable collinearity levels. Additionally, the inverse VIF values ranged between 0.571 and 0.993, further confirming the absence of multicollinearity issues. In general, VIF values less than 10 and 1/VIF values greater than 0.1 are considered to indicate freedom from multicollinearity [53]. Therefore, it was concluded that the model investigating the factors influencing corporate environmental disclosure in this study did not suffer from severe multicollinearity, and the selection of variables was appropriate for further empirical testing.

Table 4. Variance Inflation Factor

Variable	VIF	1/VIF
BOARD	1.750	0.571
IDP	1.670	0.598
LNSIZE	1.330	0.754
CPC	1.290	0.777
TOPONE	1.100	0.909
INVE	1.070	0.931
EI	1.060	0.943
TOBINQ	1.040	0.958
FCF	1.020	0.982
LEV	1.010	0.993
Mean	VIF	1.230

4.4. Regression analysis

4.4.1. Equity incentive and investment efficiency

Table 5 presents the regression results for Models 1 to Model 3, which examine the effects of equity incentives and CPC membership on investment efficiency.

Model 1 reports the relationship between equity incentives and investment efficiency. The coefficient is -0.0790 ($p < 0.05$). Since investment efficiency (INVE) is defined as a negative indicator, higher values represent greater inefficiency, this result implies that stronger equity incentives reduce inefficient investment and thereby enhance efficiency. Beyond the contractual explanation of mitigating agency problems, expectancy theory [12] highlights a motivational pathway: when managers perceive a stronger link between effort, performance, and reward, they are more likely to allocate resources prudently and avoid wasteful or opportunistic projects. Thus, hypothesis H2 is supported. To further examine whether such effects extend to executives' value systems, Model 2 introduces CPC membership.

Model 2 shows that CPC membership is associated with reduced inefficiency (-0.0189, $p < 0.10$). This effect can be understood both institutionally and behaviourally. Institutionally, CPC affiliation constrains opportunistic behaviour through organizational oversight. Behaviourally, executives who identify with the CPC internalize collective values such as altruism and long-term responsibility [26], which shape more sustainable investment choices. This interpretation is consistent with social identity theory [25], which posits that group identification strengthens adherence to group norms. Thus, hypothesis H4 is supported. To test whether these two mechanisms complement each other, Model 3 incorporates both variables.

Model 3 confirms the robustness of the findings: equity incentives (-0.0808, $p < 0.05$) and CPC membership (-0.0196, $p < 0.10$) both remain significant, with slightly stronger effects compared to Models 1 and 2. This suggests a complementary relationship, where extrinsic incentives provided by equity contracts and intrinsic motivations derived from political identity jointly strengthen managers' commitment to efficient resource allocation.

Overall, these results suggest that both economic incentives and value-based identities enhance investment efficiency. Managerial behaviour is thus shaped not only by contractual arrangements but also by internalized norms and motivations. These findings lay the groundwork for the mediation analysis in the next section.

Table 5. Regression Analysis Result (1)

	MODEL 1	**MODEL 2**	**MODEL 3**
	INVE	**INVE**	**INVE**
EI	-0.0790**		-0.0808**
	(-2.15)		(-2.20)
CPC		-0.0189*	-0.0196*
		(-1.77)	(-1.84)
TOPONE	0.000634*	0.000514	0.000573
	(1.70)	(1.38)	(1.54)
IDP	-0.000792*	-0.000796*	-0.000760*
	(-1.77)	(-1.78)	(-1.70)
FCF	-0.00136	-0.00134	-0.00135
	(-0.87)	(-0.85)	(-0.86)

	MODEL 1	MODEL 2	MODEL 3
	INVE	**INVE**	**INVE**
TOBINQ	-0.000674	-0.000659	-0.000619
	(-0.55)	(-0.54)	(-0.51)
LEV	-0.000409*	-0.000421*	-0.000409*
	(-1.84)	(-1.90)	(-1.84)
LNSIZE	0.00743*	0.00685*	0.00714*
	(1.83)	(1.69)	(1.76)
_cons	-0.1050	-0.0890	-0.0941
	(-1.08)	(-0.91)	(-0.96)
N	1343	1343	1343
R^2	0.015	0.014	0.018
adj. R^2	-0.209	-0.211	-0.207
F	2.403	2.188	2.529

Note. *t statistics in parentheses.* $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

4.4.2. Investment efficiency between equity incentive and firm performance

Table 6 presents the regression results for Models 1 to 3, which test the mediating role of investment efficiency in the relationship between equity incentives and firm performance.

Model 1 shows that equity incentives are positively related to firm performance (0.0862, $p < 0.05$), supporting H1. This aligns with agency theory, which argues that equity-based compensation aligns managerial and shareholder interests and discourages opportunism.

Model 2 examines the effect of investment efficiency on firm performance. The coefficient is -0.0663 ($p < 0.05$). Given that INVE is a negative indicator, this result means that reducing inefficient investment enhances firm performance. This interpretation is consistent with Section 4.5.1, where a negative coefficient denoted greater efficiency.

Model 3 incorporates both equity incentives and investment efficiency. The results remain consistent: equity incentives (0.0850, $p < 0.05$) positively affect performance, while investment efficiency (-0.0653, $p < 0.05$) negatively affects it. Importantly, the coefficient of equity incentives declines slightly from 0.0862 (Model 1) to 0.0850, suggesting that part of the effect of equity incentives on performance operates indirectly through improving investment efficiency.

Following the three-step procedure for mediation analysis [54], these results confirm a partial mediating effect (H3). Managers motivated by equity-based compensation not only act in alignment with shareholder interests but also allocate resources more effectively, avoiding wasteful overinvestment or excessive conservatism. Expectancy theory [12] offers further insight: when managers see a clear link between effort, performance, and compensation, they are more motivated to pursue long-term, value-enhancing projects. By improving investment efficiency, equity incentives reinforce this expectancy pathway and ultimately elevate firm performance.

Taken together, the findings indicate that equity incentives affect firm outcomes both directly and indirectly through investment efficiency.

Table 6. Regression Analysis Result (2)

	MODEL 1	MODEL 2	MODEL 3
	ROA	ROA	ROA
EI	0.0862**		0.0850**
	(2.44)		(2.41)
INVE		-0.0663**	-0.0653**
		(-2.35)	(-2.32)
TOPONE	0.00116***	0.00127***	0.00122***
	(3.10)	(3.36)	(3.25)
BOARD	0.00706	0.0109	0.00951
	(0.31)	(0.48)	(0.42)
IDP	-0.000968	-0.000931	-0.000970
	(-1.56)	(-1.50)	(-1.56)
LEV	-0.000470**	-0.000480**	-0.000493**
	(-2.20)	(-2.24)	(-2.31)
LNSIZE	0.00243	0.00323	0.00305
	(0.61)	(0.81)	(0.76)
_cons	-0.00746	-0.0299	-0.0251
	(-0.06)	(-0.25)	(-0.21)
N	1223	1223	1223
Industry/Year	YES	YES	YES
R^2	0.028	0.028	0.034
adj. R^2	-0.219	-0.220	-0.214
F	4.708	4.640	4.826

Note. *t statistics in parentheses.* $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

4.5. Robustness test

To examine the robustness of the baseline findings, this study adopts an alternative measure of investment efficiency based on Chen Model [55], which has been applied in subsequent studies [37, 56]. In this approach, the absolute value of the residual term is used as the proxy for investment inefficiency (CHEN). The model is specified as:

$$CHEN_{i,t} = \alpha + \beta_1 Growth_{i,t-1} + \beta_2 NEG_{i,t-1} + \beta_3 Growth_{i,t-1} * NEG_{i,t-1} + \varepsilon_{i,t}$$

Where: i (company number) = 1, ... , N; t (year time) = 1,…T; $Inv_{i,t}$ represents total investment of company i at time t; $Growth_{i,t-1}$ represents operating income growth rate of company i at time t-1; $NEG_{i,t-1}$ represents dummy variables for operating income growth of company i at time t-1; $\varepsilon_{i,t}$ is residual.

Table 7 reports the regression results using this alternative measure. The coefficient of equity incentives remains significantly negative (-0.0780, $p < 0.05$), and CPC membership is also negatively related to investment inefficiency (-0.0208, $p < 0.05$). These results confirm that both equity incentives and CPC membership consistently reduce inefficient investment, reinforcing the conclusion that managerial incentives and political identity jointly promote efficient resource allocation.

Table 7. Robustness Test Results (1)

	MODEL 1	MODEL 2	MODEL 3
	CHEN	CHEN	CHEN
EI	-0.0760**		-0.0780**
	(-2.21)		(-2.27)
CPC		-0.0208**	-0.0214**
		(-2.08)	(-2.14)
TOPONE	0.000736**	0.000612*	0.000669*
	(2.11)	(1.75)	(1.92)
IDP	-0.000776*	-0.000776*	-0.000741*
	(-1.86)	(-1.86)	(-1.77)
FCF	-0.00166	-0.00163	-0.00165
	(-1.13)	(-1.11)	(-1.12)
TOBINQ	-0.000762	-0.000741	-0.000703
	(-0.67)	(-0.65)	(-0.62)
LEV	-0.000405*	-0.000417**	-0.000405*
	(-1.95)	(-2.01)	(-1.95)
LNSIZE	0.00616	0.00556	0.00584
	(1.62)	(1.46)	(1.54)
_CONS	-0.0805	-0.0635	-0.0685
	(-0.88)	(-0.69)	(-0.75)
N	1343	1343	1343
R^2	0.017	0.017	0.021
ADJ. R^2	-0.207	-0.207	-0.203
F	2.724	2.642	2.966

Note. *t statistics in parentheses.* $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 8 further examines the mediating role of investment efficiency in the relationship between equity incentives and firm performance under the alternative measure. The results show that equity incentives are positively related to firm performance (0.0862, $p < 0.05$) in the direct model. When investment efficiency is included, the coefficient of equity incentives decreases slightly to 0.0843 ($p < 0.05$), while investment efficiency itself is negatively related to firm performance (-0.0755, $p < 0.05$). This pattern replicates the mediation effect found in Section 4.5.2, indicating that part of the effect of equity incentives on performance operates through improved investment efficiency.

Table 8. Robustness Test Results (2)

	MODEL 1	MODEL 2	MODEL 3
	ROA	ROA	ROA
EI	0.0862**		0.0843**
	(2.44)		(2.39)
CHEN		-0.0770**	-0.0755**
		(-2.58)	(-2.54)

	MODEL 1	MODEL 2	MODEL 3
	ROA	ROA	ROA
TOPONE	0.00116***	0.00128***	0.00124***
	(3.10)	(3.41)	(3.30)
BOARD	0.00706	0.0109	0.00946
	(0.31)	(0.47)	(0.41)
IDP	-0.000968	-0.000940	-0.000978
	(-1.56)	(-1.51)	(-1.58)
LEV	-0.000470**	-0.000483**	-0.000496**
	(-2.20)	(-2.26)	(-2.32)
LNSIZE	0.00243	0.00321	0.00303
	(0.61)	(0.80)	(0.76)
_CONS	-0.00746	-0.0291	-0.0243
	(-0.06)	(-0.25)	(-0.21)
N	1223	1223	1223
R^2	0.028	0.029	0.035
ADJ. R^2	-0.219	-0.218	-0.213
F	4.708	4.830	4.976

Table 8. (*Continued*)

Note. *t statistics in parentheses.* $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Taken together, the robustness tests yield results consistent with the baseline analysis in terms of coefficient signs, magnitudes, and significance levels. This consistency strengthens confidence in the validity of the study's conclusions. Beyond statistical robustness, the findings also highlight behavioural stability: whether viewed through contractual incentives or value-driven identities, managers tend to reduce inefficient investment and thereby enhance firm performance.

5. Conclusions and recommendations

This study examines how equity incentives influence firm performance through investment efficiency and how executives' CPC membership further shapes managerial decision-making. First, the positive relationship between equity incentives and firm performance (H1) is consistent with Sun and Zhang [13], who found that stock option schemes enhanced firm value in Chinese listed firms. Second, the evidence that equity incentives improve investment efficiency (H2) aligns with Liu and Jiang [19], who reported that such incentives mitigated overinvestment, and Qiao et al. [4], who showed that managers allocated capital more effectively when their compensation was equity-based. Third, the partial mediating role of investment efficiency (H3) resonates with Chen and Lin [14], who demonstrated that improvements in resource allocation explained part of the performance gains from incentive schemes. Finally, the positive effect of CPC membership on investment efficiency (H4) is supported by Li et al. [27], who highlighted the role of CPC oversight, and Lv and Fang [26], who emphasized the influence of political identity on sustainable managerial behaviour. These findings remain robust across alternative measures and model specifications, underscoring the central role of investment efficiency as a behavioural mechanism.

The findings extend agency theory by showing that incentives do not merely align interests mechanically but may operate through psychological channels that can shape managerial decision-making. Drawing on expectancy theory, equity incentives can be interpreted as enhancing managers' belief that effort translates into performance and reward, which may foster a forward-looking investment orientation. At the same time, CPC membership functions as a salient social identity, consistent with social identity theory, which may encourage managers to internalize collective norms that can temper opportunism. Taken together, these insights highlight a dual mechanism, extrinsic incentives and intrinsic identity, that may help explain improved investment efficiency and performance. By integrating psychological perspectives into the governance literature, this study suggests that contractual and cognitive forces may jointly shape firm outcomes.

For practitioners, several actionable insights follow from these results. First, incentive schemes should make the effort–reward link explicit, thereby reinforcing managers' expectancy and reducing incentives for short-term manipulation. Second, extrinsic rewards need to be balanced with initiatives that foster intrinsic motivation and ethical responsibility, such as leadership development and value-based training. Third, in contexts where CPC membership is present, firms can harness its normative influence to promote prudent behaviour, while simultaneously strengthening executives' professional competence to ensure that identity-driven restraint is accompanied by sound judgement. Finally, robust monitoring systems are essential to contain behavioural risks and safeguard long-term performance. Practical measures to achieve this may include independent financial audits, oversight during vesting periods, regular compliance checks, and board-level supervision, all of which help ensure accountability and alignment with long-term objectives.

Several limitations should be acknowledged. First, the study focuses on Chinese listed firms, which may constrain the generalizability of the findings to other institutional and cultural settings. Second, the psychological mechanisms underlying investment efficiency are inferred indirectly from behavioural outcomes rather than captured through direct measures, limiting the precision with which constructs such as expectancy, moral identity, and risk preferences can be assessed. Third, CPC membership is coded as a binary indicator, which simplifies the construct and overlooks potential variation in the strength and salience of political identity across executives.

Future research could address these limitations in several ways. Comparative studies across different institutional and cultural contexts would help establish the external validity of the results. Incorporating survey or experimental data alongside archival analysis would allow psychological constructs to be measured more directly. In addition, developing richer indicators of political identity, beyond a binary coding of CPC membership, could capture variation in identity strength and salience, offering a more nuanced understanding of its behavioural implications.

Overall, this study identifies investment efficiency as the central mechanism linking equity incentives to firm performance and demonstrates that CPC membership enhances outcomes by reinforcing identity-based motivations. From an organisational psychology perspective, the findings show how extrinsic rewards and intrinsic values interact to shape managerial decision-making. Looking ahead, integrating psychological measurement with governance research holds strong potential to deepen understanding of how incentives and identities jointly guide behaviour in complex organisational contexts.

Conflict of interest

The authors declare no conflict of interest

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