How Investment Efficiency Affects Firms Performance?

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Abstract

This research aims to investigate the relationship between investment efficiency and firm performance. Multivariate linear regression was used to test the research hypothesis. The statistical population was 112 companies listed to the Tehran Stock Exchange during 2012-2021 (1120 firm-year observations). The research results showed no significant relationship between investment efficiency and firm performance. However, the additional test showed a positive relationship between underinvestment and firm performance. On the other hand, there is a negative relationship between overinvestment and firm performance.

1 | Introduction

Financial policies, including debt, dividend, and triple investment, are essential in corporate finance [1]. Debt policy refers to the amount of debt, i.e., leverage, dividend policy refers to the amount of dividends paid, and investment policy is related to the amount of investment [2]. Therefore, these three financial policies depend on each other and determine the company's profitability. However, over the past decades, the collective role of these policies has sparked much debate among the academic community worldwide. The discussion began with Modigliani and Miller [3], who showed the irrelevance of debt and dividend policy with investment policy and firm performance in a perfect capital market without taxes, various costs, and information asymmetry. On the other hand, these assumptions are strongly criticized in an imperfect capital market, indicating the interdependence between these three financial policies in a company's decision-making process to improve profitability [4].

A company's profitability partly depends on investment strategies in an uncertain environment [5]. During management, managers must allocate resources and capital effectively to achieve the optimal investment where marginal benefits equal marginal costs. Any investment that exceeds the optimal level represents inefficient investment decisions. Therefore, the problem of overinvestment, compared to the expected investment requirement, makes a firm's performance less effective. Overinvestment incentives originate from the misalignment of interests between managers and investors [6].

Managers try to increase their assets under management to collect personal benefits, while investors pay attention to profit maximization to increase the company's value in the future [7]. As a result, managers expand the level of investment and increase the probability of investing in projects with negative net present value (NPV) [8]. To limit such discretionary behavior, investors incur high costs to monitor their agents to coordinate interests between the parties. Inefficient investment decisions and high monitoring costs worsen firm performance [9]. Therefore, the current research investigates the relationship between investment efficiency and company performance.

The accepted Iranian companies have been selected as samples in the research for two main reasons. First, Iran's financial market is underdeveloped, with weak institutional quality and severe information asymmetry, and commercial banks provide the majority of financial resources to companies. Secondly, the overinvestment problem in this country has been ignored, although the conflict of interest between shareholders and managers is serious. In summary, the results are supposed to contribute to the existing empirical investigation in two aspects. First, this study is the first attempt to consider the effect of investment efficiency and firm performance. Second, our results address the issue of investment inefficiency and performance.

2 | Theoretical Foundations and Development of Hypotheses

2.1 | Investment Efficiency

Investment is the current value of money in a period to earn income in the future that the investor for the time of receiving the funds; the expected inflation rate; Uncertainty in future payments rewards. The investor can be an individual, the government, a pension fund, or a company. Also, this definition includes all types of investment: companies investing in equipment and devices and individuals investing in stocks, bonds, durable goods, or land and real estate. Investment can be considered one of the crucial factors in solving countries' economic problems and expanding and developing countries and businesses. But this alone is not enough [10]. Due to the limitation of financial resources, in addition to the issue of investment development, increasing the efficiency of investment is also one of the essential issues [11].

Investment efficiency means accepting projects with a positive net present value, and investment inefficiency means passing on these investment opportunities (underinvestment) or choosing projects with a negative net present value (overinvestment). Investor inefficiency occurs if a project does not get the expected return in real conditions [12].

In determining the efficiency of investment, there are at least two theoretical criteria: the first criterion states that to finance investment opportunities, there is a need to collect resources. All projects with a positive net present value in an efficient market should be financed. However, a large number of research studies in the financial field have shown that financial constraints limit managers' ability to provide finance [13]. The second criterion also states that if the company decides to provide financing, there is no guarantee that the correct investment will be made. For example, managers may make inefficient investments by choosing inappropriate projects for their interests or even misusing existing resources. Most existing articles in this field predict that choosing weak projects will lead to more investment [14].

Previous research shows that in semi-perfect markets, factors such as information asymmetry and agency problems may force managers to make ineffective investment decisions that cause over and under-investment

growth. Therefore, according to the underinvestment theory, managers may abandon low-risk projects with positive present value when shareholders finance the investment. They tend to make such investments because the equity holders bear the cost of the investment, while the benefits of these investments go to the bondholders [15]. In this way, company managers may be inclined towards risky projects that can benefit shareholders, and when large losses occur, they may be transferred to bondholders. On the other hand, overinvestment is caused by the lack of alignment between the interests of managers and shareholders. In the presence of free cash flows, company managers tend to expand their company and to achieve their goals; they choose projects with a negative net present value that reduces shareholders' value [16].

According to Biddle et al.'s [17] argument, expected investment levels are based on investment growth opportunities. According to them, underinvestment is caused by high financial leverage and limited access to cash, while overinvestment is caused by high cash access and lack of financial leverage. They state that underinvestment and overinvestment are caused by two types of anomalies: moral hazard and inconsistent choice, both caused by information asymmetry. The moral hazard model suggests that managers invest in projects with negative net present value until there is a divergence in the interests of the owner and the agent. Moral hazard can lead to overinvestment and underinvestment, depending on the capital access level [17].

The theory of inconsistent selection also suggests that if managers have more knowledge of the company's prospects than investors, they will try to time the release of capital in such a way as to sell securities as high as possible. If they are successful in this action, they invest their income more than optimally. Despite this, investors may rationally ration capital this way, leading to underinvestment [18]. On the other hand, as free cash flows increase, managers may invest below the cost of capital or waste cash on organizational inefficiencies to avoid paying cash. This approach leads to overinvestment [19]. According to Jensen's [20] opinion, debt can reduce managers' tendency to overinvest and thus reduce operating cash flow costs. It means that the financial leverage ratio is negatively related to overinvestment. Jensen [20] states that managers use all cash to invest in projects with negative net present value. Such an approach is called "creating an empire" [20]. Investment efficiency reduces the information gap between different stakeholder groups by reducing the conflict of interests, and by aligning the interests between them, it will reduce the information asymmetry and increase the company's value [21].

Agency theory also deals with "over-investment," based on which the conflict between managers and shareholders is formed. Managers tend to increase the company's size, even by accepting weak projects that reduce shareholders' wealth. If excess cash flows are unavailable, the managers' ability to achieve this goal will be limited, but debt financing can overcome this limitation. Subsequently, the manager must pay the principal and interest on these debts with cash that was supposed to be used in weak projects [22].

2.2 | Investment Efficiency and Firm Performance

A perfect capital market suggests some assumptions, including (1) no taxes, transaction costs, and bankruptcy among market participants; (2) two-way informational symmetry between shareholders and managers; (3) fair debt burden between shareholders and debt holders [3]; Balanced theory states the advantage of the debt tax shield and the costs of the financial crisis. Tax theory shows that dividends are paid under different tax pressures [23]. Hierarchical theory emphasizes the hierarchy of financing from minimum to maximum sources of cash [24]. The bird-in-the-hand theory supports the role of dividends in reducing uncertainties [25]. Agency theory expresses the conflict of interest between managers and shareholders [26].

Conflict of interest occurs due to the difference in shareholders' ownership rights and managers' management rights [27]. With a comprehensive understanding of internal performance, managers decide to profit with higher salaries and assets under control. Such a primary motivation explains the overinvestment. The problem may be exacerbated if shareholders fail to recognize their behavior by monitoring business activities[28]. As a result, overinvestment leads to investment in projects with negative NPV and indirectly destroys the value of the company [8].

Various empirical studies have shown a negative relationship between overinvestment and profitability. Shima [29] found a negative effect of overinvestment in Singapore companies in 2005-2011. Farooq et al. [30] investigated investment at three levels: over-investment, optimal investment, and under-investment for Chinese listed companies from 1998 to 2014 [30]. Guariglia and Yang [31] suggest that investment rarely reaches the desired level because agency issues limit financing access and worsen company performance [31]. Finally, Yang [32] also proved that overinvestment negatively affects firm performance [32]. Finally, this research stated the following hypotheses based on the above material:

- *H1: There is a relationship between investment efficiency and firm performance.*
- *H2: There is a negative relationship between overinvestment and firm performance.*
- *H3: There is a positive relationship between underinvestment and firm performance.*

3 | Research Methodology

3.1 | Statistical Population

The statistical population of this research includes the selected companies listed to the Tehran Stock Exchange, which have the following conditions from 2012 to 2021 (10 years):

- *The selected samples must have been listed in the Tehran Stock Exchange before 2012.*
- *In terms of increasing the comparability of its financial period ending in March.*
- *It has not changed his activity or financial year during the studied years.*
- *The company's type of activity is production, so financial institutions, investment, and banks are not included in the sample.*

In this order, the number of companies with the aforementioned characteristics that can be used as a statistical sample is 112, so the number of observations is 1120.

3.2 | Research Model

To test the research hypotheses, the following regression *Model (1)* has been used:

$$Per_{i,t}=\beta_0+\beta_1 Per_{i,t-1}+\beta_2 Inv_{i,t}+\beta_3 Gro_{i,t}+\beta_4 Risk_{i,t}+\beta_5 Liq_{i,t}+\beta_6 Tan_{i,t}+\beta_7 Size_{i,t}+\varepsilon_{i,t} \tag{1}$$

n the present model, Per is for the current year (t) and the previous year (t-1), which uses three profit criteria: one-time Earnings Before Interest and Tax (EBIT), Earnings Before Tax (EBT), Earnings After Tax (EAT) is assessed on total assets. Div shows dividends paid. Debt is total debt to total assets. Size is the natural logarithm of total assets. Gro is sales growth. RISK is profitability changes. Liq is the quick liquidity ratio. Tan is fixed assets to total assets. The following *Model (2)* is used to calculate investment efficiency (Inv):

$$Inv_{i,t} = \beta_0 + \beta_1 Grow_{i,t}+ \sum Control_{j,t,t-1} + v_{i,t}. \tag{2}$$

$Inv_{i,t}$: Change in total net fixed assets, long-term investment, and intangible assets over the average total assets of the company in year t. $Grow_{i,t}$: annual income growth rate of company i in year t.

The control variables in *Model (2)* are:

lev $_{i,t,t-1}$ (financial leverage of the company): the ratio of total liabilities to total assets. Age $_{i,t,t-1}$ (age): the logarithm of the number of years the company has been admitted to the Tehran Stock Exchange. Cash $_{i,t,t-1}$ (cash ratio): (cash + short-term investment) / average assets in year t-1. Size $_{i,t,t-1}$ (size): natural logarithm of

assets at the beginning of the year. Ret $_{i,t,t-1}$ (annual stock return): Annual return on stocks purchased or held yearly.

Based on Richardson's [33] research, sales are used as a variable to estimate expected investment opportunities. This model argues that the company's sales numbers show the company's investment expectations in an efficient market. The residuals of this equation are calculated by placing the figure calculated for the total investment in the above regression equation [33]. Positive lag (positive deviation from the expected investment) indicates the selection of projects with a negative net present value, i.e., excessive investment, and negative lag (negative deviation from the expected investment) indicates the passing of investment opportunities with a positive present value, i.e., investment less than will be the limit. Investment efficiency is measured as the absolute value of this error component multiplied by a negative one. Therefore, the higher this value, the higher the investment efficiency [33].

4|Research Results

4.1|Descriptive Statistics of Data

For *Model (1)* analysis in this research, panel data was used. The results of descriptive statistics are shown in *Table 1-2*.

Table 1. Statistical index of research variables.

Variabels	Symbol	Mean	Medan	Max	Min	S.D
Performance	PER1 EBT	0.146	0.125	0.72	-0.79	0.18
Performance	PER2 EAT	0.125	0.108	0.69	-0.79	0.168
Performance	PER3 EBIT	0.148	0.124	0.78	-0.78	0.15
Firm Size	SIZE	14.61	14.49	20.46	10.49	1.606
Growth	GROW	0.15	0.18	0.99	-1.92	0.34
Risk	RISK	0.007	0.002	0.77	-0.59	0.11
Liquidy	LIQ	1.48	1.31	5.68	0.07	0.85
Tangibility	TAN	0.24	0.205	0.79	0.001	0.17
Dividend	DIV	0.048	0.018	0.366	0.000	0.065
Debt	DEBT	0.618	0.589	3.97	0.046	0.37
Investment	INV	0.00003	-0.004	0.45	-0.46	0.072

Table 2. Statistical index of research variables.

Variabels	Symbol	%	Number	0 or 1
Over investment	OVER	55.8	625	(0)
		44.2	495	(1)
Under investment	UNDER	44.38	497	(0)
		55.63	623	(1)

4.2|Descriptive Statistics of Data

According to *Model (1)*, research hypotheses were tested, and the results are shown in *Tables 3-5*.

Table 3. Test of the first hypothesis.

Variable	β	t Statistic Sig.	β	t Statistic Sig.	β	t Statistic Sig.
PER(-1)	.485	6.67 0.000	–	–	–	–
PER2(-1)	–	–	0.47	6.75 0.000	–	–
PER3(-1)	–	–	–	–	0.88	18.63 0.000
SIZE	-.005	-0.534 0.59	0.001	-0.176 0.86	0.001	0.498 0.618
GROW	-.012	-0.282 0.77	-0.023	-0.64 0.518	-0.009	-0.788 0.43
RISK	.44	6.459 0.000	0.41	6.329 0.000	0.901	4.222 0.000
LIQ	.068	2.504 0.0124	0.064	2.68 0.007	0.005	0.639 0.522
TAN	-.246	-1.33 0.18	-0.191	-0.122 0.222	-0.048	-0.83 0.405
DIV	-.804	-1.38 0.166	-0.707	-1.33 .181	-0.256	-0.1343 0.179
DEBT	-.019	-0.176 0.85	-0.032	-0.33 0.735	-0.002	-0.062 0.95
INV	.303	0.34 0.72	0.25	0.319 0.749	0.44	1.58 0.112
Sargan test	20.065		21.914		13.24	
Sargan test	0.63		0.525		0.94	
Arellano and band (tool ranking)	AR(1) 0.0001	AR(2) 0.3237	AR(1) 0.0012	AR(2) 0.1928	AR(1) 0.0395	AR(2) 0.555

The results show that there is no significant relationship between investment efficiency and three performance measures: EBIT, EBT, and EAT.

Table 4. Test of the second hypothesis.

Variable	β	t Statistic Sig.	β	t Statistic Sig.	β	t Statistic Sig.
PER(-1)	0.48	8.08 0.000	–	–	–	–
PER2(-1)	–	–	0.46	8.002 0.000	–	–
PER3(-1)	–	–	–	–	0.84	10.68 0.000
SIZE	-0.012	-1.94 0.052	-0.003	-0.522 0.601	-0.001	-0.412 0.67
GROW	-0.006	-0.185 0.85	-0.02	-0.806 0.42	0.027	3.77 0.002
RISK	0.44	9.24 0.000	0.418	-0.079 0.000	0.447	11.55 0.000
LIQ	0.049	2.14 0.03	0.045	2.21 0.027	0.029	6.74 0.000
TAN	-0.32	-2.89 0.003	-0.23	-2.27 0.023	-0.133	-5.191 0.000
INV OVER	-0.135	-2.37 0.017	-0.119	-2.99 0.021	-0.044	-4.458 0.000
Sargan test	26.63		27.85		18.27	
Sargan test	0.27		0.22		0.74	
Arellano and band (tool ranking)	AR(1) 0.000	AR(2) 0.247	AR(1) 0.000	AR(2) 0.296	AR(1) 0.0452	AR(2) 0.548

Table 5. The third hypothesis test.

Variable	β	t Statistic Sig.	β	t Statistic Sig.	β	t Statistic Sig.
PER(-1)	0.481	7.956 0.000	–	–	–	–
PER2(-1)	–	–	0.465	7.846 0.000	–	–
PER3(-1)	–	–	–	–	0.85	10.589 0.000
SIZE	-0.012	-1.951 .0513	-0.003	-0.54 0.588	-0.001	-.37 0.705
GROW	-0.004	-0.12 0.904	-0.023	-0.76 0.441	0.002	0.236 0.812
RISK	0.44	9.208 0.000	0.416	8.989 0.000	0.88	13.55 0.000
LIQ	0.049	2.139 0.0327	0.043	2.141 0.0325	0.006	0.88 0.374
TAN	-0.314	-2.86 0.0043	-0.231	-2.27 0.022	-0.033	-0.681 0.49
DIV	-0.84	-1.96 0.05	-0.599	-1.48 0.139	-0.309	-0.941 0.346
DEBT	-0.008	-0.132 0.89	-0.018	-0.33 0.74	0.016	0.69 0.48
UNDER	0.129	2.33 0.019	0.11	2.319 0.02	0.006	2.206 0.036
Sargan test	26.92		27.97		18.42	
Sargan test	0.25		0.21		0.73	
Arellano and band (tool ranking)	AR(1) 0.000	AR(2) 0.236	AR(1) 0.000	AR(2) 0.286	AR(1) 0.046	AR(2) 0.549

5 | Conclusion and Discussion

The present research has investigated the relationship between investment efficiency and the performance of companies in an emerging market like Iran. The study's statistical population was 112 companies listed to the Tehran Stock Exchange from 2012 to 2021 (1120 firm-year observations). The research results showed no significant relationship between investment efficiency and company performance. There is also a negative relationship between overinvestment and company performance. In other words, the company's performance will decrease as the investment increases too much. Also, the results indicate a positive relationship between underinvestment and company performance. Investment efficiency is achieved when the firm invests only in all projects with a positive net present value. Of course, this scenario works if the market is perfect and none of the problems of the imperfect market exist, including incorrect selection and agency costs [34].

One of the main goals of countries' economic policies and decisions is economic development and efficient investment fundamentally affects sustainable economic growth and development [35]. On the other hand, competitiveness is a central issue for achieving optimal economic growth and sustainable development. Competitive strength is one of the characteristics of a successful company. Market competition is an influential factor in the investment and financial performance of the company, which can lead to an increase in investment and business efficiency and affect the value of the company and agency costs [36]. The agency issue arises from the separation between corporate ownership and management and is an obstacle to achieving the goal. Professional managers are responsible for running most large companies and feel they have the authority to run companies without considering the interests of shareholders [37].

Since the competitive environment plays an essential informational role, a strong competitive environment creates an influential corporate governance culture and leads to improved monitoring of management decisions on investment and efficiency. It can be associated with increased managerial efficiency and

transparency in decision-making and improved accountability, which reduces the risk of incorrect investment decisions. Under competition, managers are encouraged to perform their duties to maintain the company's sustainability. When stock price information improves, capital allocation in companies with more market power is done more efficiently, increasing the company's investment efficiency and financial performance [38].

These findings provide implications especially for emerging markets, as the analysis was based on an emerging market such as Iran. Companies in Iran are heavily monitored by the government, which can reduce information asymmetry. Therefore, the results of this study provide several implications for researchers, managers, regulatory agencies, and governments that may be useful for developing and developed countries. Hierarchy theory shows that when the market is imperfect, and there is higher information asymmetry, corporate managers can take advantage of it and invest their excess free cash flows in projects with positive or negative present value (inefficiency). This causes representation issues. Therefore, supervisory mechanisms such as corporate governance should be used to monitor the behavior of managers effectively.

This study is limited to considering manufacturing companies. Hence, other industries such as finance, mining, oil, and gas are not considered due to differences in operational, regulatory, and financial characteristics. Therefore, it is suggested that other types of companies should be considered. Moreover, this study can be investigated in public, small and medium enterprises, and private enterprises, which may provide fruitful findings.

Author Contributaion

Conceptualization, Z.B. and B.P.M.; Methodology, B.P.M.; Software, Z.B.; Validation, Z.B. and B.P.M; data maintenance, B.P.M.; writing-creating the initial design, Z.B. and B.P.M; writing-reviewing and editing, Z.B. and B.P.M.

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Data Availability

Data used in this work are available from the Codal Database. www.codal.ir

Conflicts of Interest

The authors declare no conflict of interest.

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