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The Effect of Brand Capital and the Determinants of Brand Value on Investment Efficiency and Asset Growth

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Abstract

Customer-oriented management approaches challenge traditional performance measurement criteria because they recognize that producing goods and providing services does not necessarily create value for a firm. With customer value creation treated as the primary driver of corporate investment activity, this study examined the effects of brand capital and the determinants of brand value on investment efficiency and firm asset growth. The statistical population comprised all firms listed on the Tehran Stock Exchange from 2015 to 2024. To increase sample homogeneity and further strengthen the validity of the findings, several restrictions were applied, and data from a final sample of 151 firms (1,510 firm-year observations) were analyzed. The results indicated that brand capital and brand age negatively affect firms' investment efficiency and asset growth, whereas advertising intensity and market share improve both investment efficiency and asset growth. Firms characterized by inflexibility and limited adaptability to market conditions, together with firms experiencing unfavorable growth in advertising and marketing expenditures, showed lower investment efficiency and financial stability, particularly among older firms. By contrast, firms that used targeted and effective advertising, as well as those whose sales ratio was higher than that of other firms operating in the same industry, were more successful in undertaking investments and increasing the value of their assets. Managers should therefore emphasize market orientation rather than devote excessive resources to short-sighted marketing activities. In addition, shareholders and boards of directors can align managerial actions more closely with customer needs and preferences by developing reward plans based on customer acquisition and customer-orientation indicators. Such alignment provides a basis for sales growth, financial stability, and greater investment efficiency.

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1. Introduction

Investment decisions form the starting point for the development of a firm's financial policy and play a decisive role in its future growth and development. At the same time, such decisions are fundamental to both macroeconomic growth and corporate finance. During the corporate investment process, managers identify potential investment opportunities, select projects with positive net present value, and continue to invest as long as the marginal benefit of the investment exceeds its marginal cost, thereby facilitating the efficient allocation of capital (He et al., 2019). However, in practice, due to market imperfections, information asymmetry and disputes between owners and agents, the investment efficiency of enterprises often deviates significantly from the optimal level (Chen et al., 2017). Overinvestment and underinvestment are types of inefficient investment. Both types of inefficiency reduce business value and shareholder wealth and limit the long-term expansion of the economy (Liu et al., 2026). Traditional measures of investment efficiency often assume that customers purchase products or services as soon as those offerings become available. This assumption is increasingly questioned, however, because it remains uncertain whether customers will actually purchase the products offered. A related question is whether the resources invested can ultimately be converted into firm value. Even if a project has a positive net present value, investments in it may be wasteful if the goods and services offered to clients do not meet their needs and preferences. Therefore, the key to enhancing the investment efficiency of enterprises lies in combining timely and suitable information gathering and utilization with optimal resource allocation decisions (Liu et al., 2026). Under resource-based and dynamic capabilities theory, firm value creation depends on identifying all tangible and intangible assets and optimizing the use of every available resource to increase sales growth and market share and to improve financial performance in both the short and long term (Sun and Cui, 2012). A valuable brand can also enhance a firm's growth and sustainability. Firms with valuable brands have experienced more rapid growth in sales, assets, and market value, while a firm's brand shapes consumers' perceptions of and attitudes toward the firm. Investment in the brand and recognition of its value-creating components are therefore of particular importance (He and Calder, 2020).

Among a firm’s stakeholders, customers are the source of sales and ultimately of profits. Investment decisions that are consistent with customer needs and preferences lead to better project selection and easier access to financial resources (Liu et al., 2026). Although financial statements do not capture this orientation, attention to customer value is essential to managerial investment decisions. Brand capital is an intangible, value-generating asset arising from the expenditures and investments a firm makes to build its brand and influence customers. Investment in brand marketing is vital to retain and attract existing clients. However, the degree and quality of the advertising/marketing spend and their intended growth rate may have varied and often opposing effects on the effective allocation of resources (Liu et al., 2026). Advertising intensity captures expenditure on advertising and marketing intended to raise brand awareness and attract customers. When managed effectively, these expenditures indicate management’s ability to build brand value and improve investment efficiency through more productive use of resources (Tanveer et al., 2022). Another factor that could affect brand value is the age of a brand. Mature companies are typically in the advanced stage of their life cycle and may benefit from customer loyalty and positive marketing derived from long-term consumer trust. Yet, their financial performance now and in the future may be lower due to technological rigidity as well as changes in demand (Mallinguh et al., 2020). Market share is the proportion of total industry sales attributable to a firm. A bigger market share might allow a firm to realize economies of scale and reduce unit costs, leading to enhanced operating efficiency and helping to make smarter investment decisions (Arianpoor, 2025).

Therefore, this study aims to provide greater knowledge of the role of market orientation and customer orientation in firm success. Specifically, it examines the effects of both the quantity and the quality of brand investment, represented by brand capital, and of the brand's value-creating dimensions, including advertising intensity, the firm's market share, and brand age, on investment efficiency and asset growth. One innovation of the study is the identification of the factors that determine the value of a firm's brand. A second innovation is the examination of the effects of these factors on both investment efficiency and asset growth. In addition, the study discusses the possibility that brand capital may have either positive or negative effects on firm financial performance and subsequently examines its effects on investment efficiency and the growth of firm assets.

2. Literature review and hypothesis development

Investment activity has two major components: investment in the brand and a value-creation component that includes advertising intensity, brand age, and firm market share. To answer the research question, this study examines the effect of each of these dimensions on investment efficiency and asset growth. In doing so, it extends authoritative prior research, including the study by Chan et al. (2025). Rather than limiting the analysis to the relationship between brand capital and firm performance, the study identifies the determinants of brand value from an extensive but dispersed body of prior research and then examines the effects of these dimensions and brand capital on two performance indicators. The value-creating components examined in the study represent tangible or intangible assets or operating expenses. From a resource-based perspective, investment in assets and operating expenditures has the potential to create value for the firm. Nevertheless, the manner in which expenditures are used may strengthen or weaken value creation, which demonstrates the importance of dynamic capabilities theory. Accordingly, examining the effects of brand equity and its value-creating dimensions on performance indicators from a dynamic capability perspective helps indicate the effectiveness of investment expenditures made by Iranian firms.

2.1. The impact of brand capital on investment efficiency and asset growth

Brand capital refers to a firm’s capacity to generate additional value through its past investment in creating and promoting its brand (Chan et al., 2025). Like other forms of organizational capital, including knowledge capital (Liu et al., 2026) and human capital (Lehtimaki and Lehtimäki, 2016), brand capital may reduce information asymmetry between firms and external stakeholders, particularly customers. Dynamic brand capital development allows information to flow in both directions: firms have information about what customers want, and customers have information about products and services offered by the firms (Liu et al., 2026). From a marketing perspective, expenditures on brand promotion are therefore unavoidable, and investment in this area is necessary to satisfy current customers and attract new customers, leading to sales growth and stronger competition in the market. From the perspective of efficient resource allocation, however, the quantity and quality of advertising and marketing expenditures, as well as their target growth rate, may have different and sometimes contradictory effects. The net effect of brand capital on investment efficiency and asset growth is therefore uncertain in advance. On the one hand, brand capital may improve investment efficiency for several reasons. A bigger market share might allow a firm to realize economies of scale and reduce unit costs, leading to enhanced operating efficiency and helping to make smarter investment decisions (Arianpoor, 2025). Therefore, this study aims to provide greater knowledge of the role of market orientation and customer orientation in firm success. Brand capital can consequently reduce underinvestment and thereby improve investment efficiency (Chan et al., 2025). Second, greater brand capital attracts more customers by communicating product and service

information effectively and, in turn, helps create a consumer database and monitoring system. Firms develop brand capital to differentiate their brands and strengthen their position and competitiveness in the market (Brexendorf et al., 2015). Third, greater brand capital enhances firm credibility by sending investors positive signals regarding unobservable firm qualities (Nelson, 1974; Grullon et al., 2004; Chemmanur and Yan, 2009). Investors want equities they know and understand, and good brand awareness can make them more familiar. Some studies have also found that brand capital may serve as a monitoring tool to control management opportunism and lessen information asymmetry between managers and investors (Hasan et al., 2022; Ismail et al., 2021). This method can reduce moral hazard and adverse selection, limit over-investment and under-investment, thus improving investment efficiency (Biddle et al., 2009).

In line with these arguments for brand capital development, empirical research by Aaker (1992), Gupta et al. (2020), and Mauer et al. (2022) revealed that brand capital, as an intangible asset, helps enterprises to differentiate themselves from competitors and obtain a competitive advantage. This distinction raises brand awareness and strengthens client loyalty. Srivastava et al. (1999) and Schau et al. (2009) showed that brand capital enables customers to understand and compare the offerings of different manufacturers more effectively and to develop a favorable attitude toward the brand. Brand capital may, however, adversely affect a firm's investment efficiency and asset growth. Some researchers argue that firms with successful brands may succumb to "active inertia", continuing to follow established product, service and competitive practices. Such behaviour constrains flexibility and innovation (Sull, 1999), as illustrated by the decline of well-known brands such as Kodak, Nokia, Blockbuster and BlackBerry. Maintaining brand visibility also requires substantial marketing expenditure, which may consume scarce resources and crowd out worthwhile investments. There are several reasons to believe that brand capital might have an adverse effect on both investment efficiency and asset growth. First, resource scarcity theory states that firms have limited resources. The overspending on brand development, such as celebrity endorsements and expensive advertising campaigns, may crowd out investment in projects with positive net present value. Such misallocation may hinder the efficiency of investment and undermine the financial stability of the firm (Liu et al., 2026). Secondly, established and well-recognized brands in companies are expected to continue to operate in the traditional way (Chan et al., 2025). Such firms may focus too heavily on retaining existing customers, overlook opportunities to attract new customers and consequently miss investment opportunities (Liu et al., 2026). Third, the development of brand capital may intensify agency problems between shareholders and managers. Managers may, for example, allocate advertising expenditures to initiatives that are unrelated to the firm's core operations because those initiatives enhance the managers' personal image or reputation. Thus, firms may miss better investment opportunities, waste resources and depart from the efficient allocation of resources (Cheng and Hou, 2024). Managerial overconfidence can also hinder the development of effective brand capital. Managers who are overconfident may undertake distinctive brand strategies that increase the chance of later failure. For example, firms could strive to develop brand capital by engaging in aggressive or hazardous techniques that undercut the very objective of reducing knowledge asymmetry. They can be interested in nothing but making the most profit in the short run, not bothering too much about what customers really want or the quality of the product. In line with these theories, empirical studies such as Myers (1977) and Nejadmalayeri et al. (2013) documented that enterprises with more brand capital have lower investment efficiency and slower asset growth.

This study was conducted in Iran, a developing country in the Middle East with a moderate GDP per capita. The World Bank separates the world's economies into four income groups – low, lower-middle, upper-middle and high. Income requirements are as follows (in US dollars):

Low income: $1,135 or less.

Lower-middle income: $1,136 to $4,495.
Upper-middle income: $4,496 to $13,935.
High income: more than $13,935.

These classifications are updated annually on July 1 based on the preceding year's GDP per capita. Iran's GDP per capita was $5,013 at the end of 2024, according to the World Bank. The World Bank also reported that Iran had shifted from a lower-middle-income economy to an upper-middle-income economy and that its GDP had increased by 5 percent compared with the previous year (World Bank, 2024). Despite its economic capacity, Iran performs relatively poorly in information and communication technology, and it performs poorly on new technology adoption and productivity and efficiency indices (Amiri and Babazadeh Sangar, 2023). Sull (1999) pointed out that the inefficiency of brand capital and the harmful effects on firms' investment efficiency and financial stability are due to restricted innovation and technology. Brand capital is consequently predicted to undermine investment efficiency and financial stability.

H1: Brand capital has a significant negative effect on a firm's investment efficiency.

H2: Brand capital has a significant negative effect on a firm's asset growth.

2.2. The effect of advertising intensity on investment efficiency and asset growth

Advertising intensity is the cost of advertising and marketing to promote the brand and attract customers. According to Tanveer et al. (2022), advertising expenditures indicate the management's capacity to utilize the firm's resources more efficiently when it is well managed, therefore leading to high investment efficiency. More extensive advertising can increase the exposure of the brand and the products of the company, assist sales growth, and result in improved profitability and stronger market dominance. A stronger market position brings about a better allocation of resources as the enterprises are better able to foresee the direction of the market and the demand for goods and services and can align the investment decisions with the strategic objectives (Tyagi and Mahajan, 2022). Hence, it is of particular importance to determine the best ratio of advertising expenditures to assets, sales and firm size. Too little advertising means less sales for the firm, while too much promotion does not necessarily mean higher sales. Meanwhile, companies must also spend on value-creating activities upstream such as research and development, to produce innovative goods and services that can enhance sales and improve financial stability. Thus, the optimal expenditure on advertising and marketing can increase the efficiency of corporate investment (Wang et al., 2021). According to Yu et al. (2021), customers acquired primarily through word-of-mouth advertising typically exhibit greater trust in the firm and its products, remain loyal for a longer period of time, generate greater lifetime value, and frequently become brand advocates themselves, generating continuous positive feedback loops. This mechanism increases the allocation of marketing and investment resources, focuses managerial attention on recruiting new customers, and boosts the overall return on investment in branding initiatives.

Raithel et al. (2011) showed that more efficient use of advertising budgets creates more investment opportunities associated with greater brand value and investor rewards. The direct impact of advertising on investment efficiency is typically less pronounced than other elements like sales volume or customer ratings (Yin et al., 2024). However, advertising becomes more effective when competition increases and firms use differentiation methods. These arguments suggest that the amount and allocation of advertising expenditure improve investment efficiency and asset growth. The third and fourth hypotheses are therefore as follows:

H3: Advertising intensity has a significant positive effect on a firm's investment efficiency.

H4: Advertising intensity has a significant positive effect on asset growth.

2.3. The impact of brand age on investment efficiency and asset growth

Older brands are associated with firms that have operated for a longer period. Over time, however, these firms may experience declining growth in sales and operating profit because organizational inflexibility, resistance to rapid and complex changes in competitive markets, and rising costs reduce their operating efficiency. Empirical research indicates that return on assets and Tobin's Q decline as firms age, partly because fixed assets depreciate and new competitors erode established competitive advantages. Younger firms therefore tend to outperform older firms in short-term measures, such as sales and profitability, as well as in operating efficiency, investment efficiency and employee productivity (Loderer and Waelchli, 2009; Haykir and Çelik, 2018; Mallinguh et al., 2020). Older firms have generally reached a mature stage of their life cycle and benefited from accumulated production experience, customer loyalty and consumer trust. Nevertheless, technological rigidity and rapid market changes may undermine their financial performance in both the short and long term. The costs continue to climb and the growth rate remains consistent for around 15 years after the firm reaches its intended level of growth, after which the indicators of the firm's performance start to fall. Reversing this trend requires substantial changes in a firm's strategy and operations. After 37 years of operation, firms therefore perform below the industry average, on average. Overall, some ratios indicate that older enterprises may have better returns, but are less efficient than younger firms (Loderer and Waelchli, 2009; Repace and Gertner, 2014). Accordingly, the fifth and sixth hypotheses predict negative effects of brand age on investment efficiency and financial stability, respectively.

H5: Brand age has a significant negative effect on a firm's investment efficiency.

H6: Brand age has a significant negative effect on a firm's asset growth.

2.4. The impact of a company's market share on investment efficiency and asset growth

Market share: The proportion of a market controlled by a particular firm. It is the percentage of total sales of a product in a market. Often, when enterprises have a higher market share, they can obtain economies of scale, reduce unit costs and increase operating efficiency. These benefits can help make investment decisions more effective as fixed costs are dispersed over more output and resources are employed more efficiently (Arianpoor, 2025). Higher sales can also expand a firm's pool of customers and improve its access to market information for making investment decisions. Higher market strength and competitive advantages also often exist with these enterprises, which reduces uncertainty and risk of investment (Stoughton et al., 2017). However, Khan (2014) highlighted that the need to rapidly expand market share involves significant investment expenditure that can depress investment returns. In general, a company with a larger market share has more pricing power and may have higher profit margins. Financial strength can facilitate efficient strategic investment, enabling managers to reinvest earnings into projects with better returns instead of ventures with short-term, low returns (Peng et al., 2021).

The majority of previous empirical research indicates that a robust customer base has a positive impact on investment efficiency. However, Liu et al. (2024) demonstrate that a greater customer concentration, i.e., a smaller customer base, constrains firms' need for innovation and decreases the efficiency of R&D spending. The fewer significant consumers a firm has, the riskier it is and the more financial restraints it has. This reliance hampers their ability to engage in aggressive or varied R&D activities and hence has an adverse effect on investment efficiency. Thus, a higher market share of the firm's products would be expected to increase its investment efficiency and asset growth. The seventh and eighth hypotheses are based on this anticipation.

H7: A company's market share has a significant positive effect on its investment efficiency.

H8: A company's market share has a significant positive effect on its asset growth.

Based on the literature and empirical background, Figure 1 presents the proposed relationships

among the key research variables:

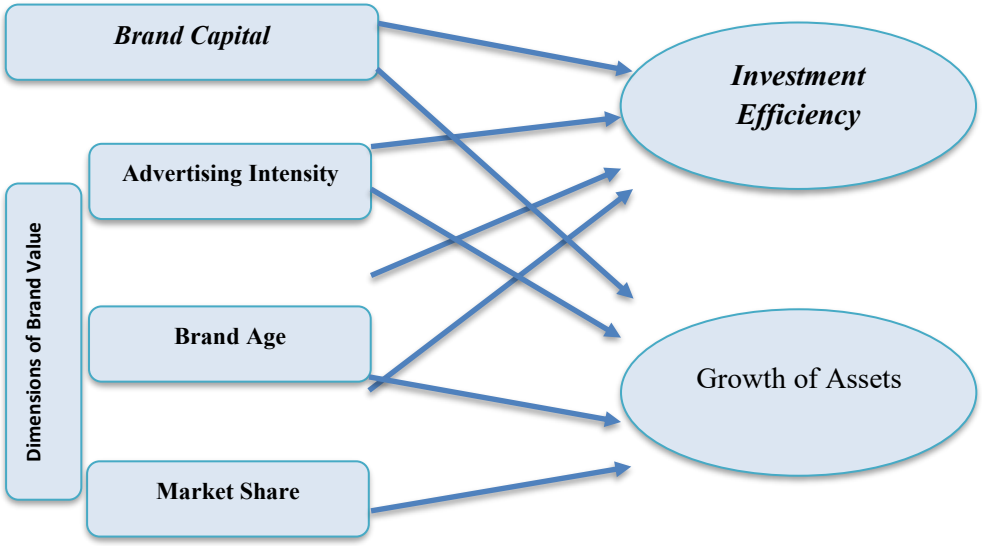


Figure 1. Conceptual model of the effects of brand capital and brand value-creating dimensions on investment efficiency and asset growth

3. Methodology

This study is applied in purpose, descriptive-correlational in design, and retrospective in terms of data collection. The statistical population comprised all firms listed on the Tehran Stock Exchange from 2015 to 2024. To improve sample homogeneity and the validity of the findings, several restrictions were imposed based on the following criteria. The final sample included 151 firms (1,510 firm-year observations):

- A firm's stock exchange ticker was not suspended for more than three months during the study period.
- A firm had to be listed on the stock exchange before the beginning of 2015, and its data had to be available.
- A firm had to have at least five years of activity on the stock exchange.
- The firms had to have the same financial reporting periods.
- A firm could not be a bank, investment institution, holding company, financial intermediary, or leasing company because such firms have different capital structures.

3.1. Development of regression models and measurement of variables:

3.1.1. Dependent variables

Investment efficiency and asset growth were used as the dependent variables in the two models:

Investment efficiency: The methods of He et al. (2019) and Richardson (2006) were used to measure investment efficiency:

$$Investment_{i,t} = \beta_0 + \beta_1 Size_{i,t-1} + \beta_2 Lev_{i,t-1} + \beta_3 Growth_{i,t-1} + \beta_4 Return_{i,t-1} + \beta_5 Age_{i,t-1} + \beta_6 Cash_{i,t-1} + \beta_7 Investment_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

Where:

$Investment_{i,t}$: The firm's investment in year t, measured as the ratio of changes in tangible and intangible assets to assets at the beginning of the period (i.e., the net increase in tangible and intangible assets divided by the firm's total assets at the beginning of the period).

$Size_{i,t-1}$: The firm's size in the previous year (the natural logarithm of assets);

$Lev_{i,t-1}$: The firm's financial leverage in the previous year (the ratio of liabilities to assets);

$Growth_{i,t-1}$: The firm's sales growth in the previous year (the change in sales revenue divided by sales revenue at the beginning of the period);

$Return_{i,t-1}$: Growth in the firm's stock market price in the previous year (the change in the stock market price divided by its price at the beginning of the period);

$Age_{i,t-1}$: The firm's age in the previous year;

$Cash_{i,t-1}$: The ratio of cash and cash equivalents to total assets in the previous year; and

$Investment_{i,t-1}$: The firm's investment in the previous year.

$\varepsilon_{i,t}$The residuals from the regression model indicate the firm's overinvestment (underinvestment) in the current period. To obtain a direct measure of investment efficiency, the absolute values of the estimated residuals are multiplied by -1 (He et al., 2019).

Asset growth: The asset growth rate was calculated as follows:

$$FS_{it} = AssGrowth_{it} = \frac{Total\ Asset_{it} - Total\ Asset_{it-1}}{Total\ Asset_{it-1}} \quad (2)$$

Where:

$Total\ Asset_{it}$: is the firm's total assets in year t; and

$Total\ Asset_{it-1}$: is the firm's total assets in year t-1 (Putra, 2019).

The study used two dependent variables: asset growth and investment efficiency. Together, asset growth and investment efficiency comprehensively reflect the sustainability of a firm's financial and investment performance (He et al., 2019; Richardson, 2006).

3.1.2. Independent variables

Brand capital, brand age, advertising intensity, and market share were used as independent variables in both research models:

Brand capital: Following Belo et al. (2014) and Hasan et al. (2022), brand capital was calculated using the following formula:

$$BC_{i,t} = (1 - \delta_0)BC_{i,t-1} + adv_{i,t} \quad (3)$$

Where:

$adv_{i,t}$: is firm i's marketing and advertising expenditure in year t. Following Kapareliotis and Panopoulos (2010), general, administrative, and selling expenses were used as a proxy for marketing and advertising expenditures.

δ_0: is the depreciation rate of the firm's brand capital in year t, which was set at 0.5;

Brand capital is formulated on the basis of advertising expenditure and its growth rate. According to Belo et al. (2014), the brand-capital depreciation rate is based on empirical evidence and is applied as an average across firms in different industries. Although this rate appears high, several international studies have used it as the average depreciation rate of brand capital (e.g., Bagwell, 2007; Lambin, 1976) because, on average, 50% of the market effect of advertising expenditure is argued to dissipate each year.

To date, all studies conducted in the Iranian economic context have used the same brand-capital depreciation rate. Moreover, no other empirical study has estimated a new brand depreciation rate.

$BC_{i,t-1}$: The firm's brand capital in the previous year.

The absolute values of brand capital were then divided by the firm's total assets. Brand capital in

the base year was calculated using the following formula:

$$BC_{i,t_0} = \frac{adv_{i,t_0}}{g+\delta_0} \qquad (4)$$

Where:

g:is the firm's growth rate of marketing and advertising expenditure. The average growth rate of this variable was calculated from the growth rates of general, administrative, and selling expenses for each firm during the study period (Belo et al., 2014; Hasan et al., 2022).

Brand age: Ries and Trout (1986) stated that when a company first enters the market, it can't manufacture goods of high quality and match customer expectations as well as industry competitors. As time goes on, the company becomes better known to its clients, and the company learns more about the market and what customers are looking for. This initial recognition process takes between three and five years. Firms that follow a growth trajectory therefore require no more than five years to establish themselves in the market. Continued firm success and brand reputation clearly depend on firm strategy, the management of tangible and intangible resources, market orientation, and other factors. For example, of the 25 leading US brands in 1923, 20 remained among the leading US brands 60 years later. Brand age was therefore calculated by subtracting five years from firm age and taking the natural logarithm of the result.

Advertising intensity: Because most firms do not separately disclose advertising expenditures in their financial statements, general, administrative, and selling expenses were divided by total assets (Kapareliotis and Panopoulos, 2010).

The basic principles and calculations of Advertising Intensity and Brand Capital, as outlined above, differ. Brand capital is an intangible asset used to promote a brand. Its growth rate is included in the calculation, and like other assets, a depreciation rate is used. Advertising intensity, on the other hand, depicts actual marketing and advertising expenditures that are classed as selling, general, and administrative costs (Liu et al., 2026; Tanveer et al., 2022). Empirically, this distinction is further supported by the absence of collinearity when these factors are included as independent variables in the model.

Market share: The market share of the sampled firms in each industry was calculated by dividing each firm's sales by total industry sales (Arianpoor, 2025).

3.1.3. Control variables

Following He et al. (2019) and Hasan et al. (2022), the study used the following control variables:

Firm size (Size): the natural logarithm of the firm's total assets at the end of the period;

Profitability (ROE): return on equity, calculated as net income divided by equity.

Financial leverage (Lev): total liabilities divided by the firm's total assets at the end of the financial period.

Growth opportunity (MTB): the market value of equity divided by its book value.

Firm loss (Loss): an indicator equal to 1 if the firm reported a loss in the current period and 0 otherwise.

3.2. Research models

This study examined the effects of brand capital and the determinants of brand value on investment efficiency and asset growth. Based on the measures introduced by He et al. (2019), Kapareliotis and Panopoulos (2010), Hasan et al. (2022), and Belo et al. (2014), the following two regression models were used to test the hypotheses:

$$InvestEff_{it} = \beta_0 + \beta_1 BrandCap_{it} + \beta_2 AdvIn_{it} + \beta_3 BrAge_{it} + \beta_4 MarketSh_{it} + \beta_5 Loss_{it} + \beta_6 Lev_{it} + \beta_7 ROE_{it} + \beta_8 Size_{it} + \varepsilon_{it} \qquad (5)$$

$$AR_{it} = \beta_0 + \beta_1 BrandCap_{it} + \beta_2 AdvIn_{it} + \beta_3 BrAge_{it} + \beta_4 MarketSh_{it} + \beta_5 MTB_{it} + \beta_6 Lev_{it} + \beta_7 ROE_{it} + \beta_8 Size_{it} + \varepsilon_{it} \quad (6)$$

Where:

$InvestEff$: The firm's investment efficiency, the dependent variable in Model 5;

AR: Asset growth, the dependent variable in Model 6;

$BrandCap$: The firm's brand capital;

$AdvIn$: The firm's advertising intensity;

$BrAge$: The firm's brand age;

$MarketSh$: The firm's market share.

The other variables in both models were defined above.

4. Findings

4.1. Descriptive statistics

Table 1 reports the descriptive statistics for the research variables. It presents the mean, median, standard deviation, skewness, and kurtosis. As shown in Table 1, the mean brand capital is 0.10. Because the score of this index measures the ratio of general, administrative, and selling expenses and their changes relative to the firm's assets, the reported value indicates a substantial level of investment in brand promotion and marketing among firms operating on the Tehran Stock Exchange.

Table 1. Descriptive statistics

Research variables		Mean	Median	SD	Skewness	Kurtosis
Independent variables	Brand capital	0.101	0.082	0.064	1.114	3.447
	Advertising intensity	0.062	0.050	0.039	1.148	3.513
	Brand age	2.763	2.773	0.450	-0.024	2.493
	Market share	0.062	0.027	0.082	1.865	5.611
Dependent variables	Investment efficiency	-0.514	-0.262	0.672	-1.757	5.200
	Asset growth	0.326	0.238	0.330	1.082	3.435
Other investment efficiency estimators	Company investment	0.344	0.099	0.634	2.363	7.873
	Sales growth	0.437	0.378	0.376	0.617	2.772
	Stock price growth	0.448	0.055	1.183	1.676	5.142
	Cash ratio	0.589	0.582	0.311	0.134	2.147
	Company age	22.566	21	8.753	1.162	4.556
Control variables	Company size	15.005	14.704	1.507	0.607	2.698
	Financial leverage	0.541	0.537	0.190	-0.062	2.093
	Growth opportunity	4.678	3.329	3.955	1.646	4.926
	Profitability	0.320	0.305	0.242	0.159	2.013
	Loss	0.083	0	0.276	-	-

The descriptive statistics for advertising intensity likewise indicate substantial operating expenditures among the sampled firms. Mean firm age was 22.5 years, suggesting that most of the firms included in the study were in the mature stage of their life cycle. In general, firms younger than three years have not yet reached the stage at which their brands are consolidated, and a firm requires between three and five years to reach this stage. Mean market share was 6 percent, indicating that each firm's sales represented, on average, 6 percent of the total sales of products in the industry in which the firm operated. Mean investment inefficiency was 51 percent and was multiplied by a negative value to obtain the investment efficiency measure. Given the level of production technology used by these firms and the country's economic conditions, this value is highly consistent with prevailing conditions. A substantial proportion of the observed inefficiency may be attributable to

outdated or underdeveloped production technologies. This weakness may also provide an opportunity to adopt advanced technologies and thereby improve the investment efficiency of listed firms, which constitute one of the fundamental pillars of the country's economy.

Table 1 also reports mean asset growth of 0.326. This rate is relatively high and is partly attributable to the country's substantial inflation during the study period. The descriptive statistics for sales growth and stock-price growth also support this interpretation. Mean financial leverage was 54 percent, indicating that a substantial proportion of firm assets belonged to creditors and lenders and were financed through increases in firm debt. Other descriptive statistics are presented in Table 1.

Table 2. Correlation coefficients among the research variables

	Investment Efficiency	Brand Capital	Advertising Intensity	Brand Age	Market Share	Size	Profitability	Leverage	MTB	Asset growth
Investment Efficiency	1									
Brand Capital	0.0496	1								
Advertising Intensity	0.045	0.474*	1							
Brand Age	-0.211*	-0.017	-0.002	1						
Market Share	0.025	-0.058*	-0.060*	-0.095*	1					
Size	-0.019	-0.227*	-0.283*	-0.017	0.306*	1				
Profitability	0.145*	-0.073*	-0.039	0.053	0.032	0.276*	1			
Leverage	0.076*	0.199*	0.182*	-0.048	0.061*	-0.067*	-0.198*	1		
MTB	-0.102*	0.186*	0.219*	0.200*	-0.155*	-0.076*	0.259*	0.091*	1	
Asset growth	-0.305*	-0.209*	-0.153*	0.170*	-0.091*	0.268*	0.309*	-0.213*	0.233*	1

NOTE: * Correlation is significant at the 0.05 level (2-tailed).

Table 2 reports the correlation coefficients among the research variables. According to the results, investment efficiency has a significant negative relationship with brand age, which is consistent with the fifth research hypothesis. Asset growth also has a negative relationship with brand capital, consistent with the second research hypothesis. In addition, advertising intensity and brand capital have a significant, positive, and relatively strong relationship. The correlation coefficient between these two variables is 0.47. Because brand capital is estimated both conceptually and structurally on the basis of advertising and marketing expenditures, the observed relationship appears reasonable. The remaining correlation coefficients are presented in Table 2.

4.2. Estimation of the final research models

To test the main research hypotheses, two models were estimated on the basis of Equations 5 and 6 presented in the methodology section. After the final dataset had been prepared, the assumptions of multivariate linear regression were examined to ensure that all required conditions were satisfied. In the first step, the reliability of the variables was assessed. Because some variables were not stationary at level, cointegration among the variables included in each model was also examined. The results of the Kao cointegration test, which is based on the Engle-Granger approach, showed that the variables in both models were cointegrated and that both models could therefore be estimated using the data at level.

The estimated variance inflation factors for the variables in both models were below 10, indicating the absence of strong collinearity among the independent variables, as reported in the results table for each model. The F-Limer and Hausman test statistics were significant at the 95% confidence level,

indicating that fixed effects should be used to estimate both models. The results of the Breusch-Pagan test were also reported and confirmed the same conclusion. According to Table 3, both models exhibited heteroskedasticity. Generalized least squares, in its weighted form, was therefore used instead of ordinary least squares. Table 3 presents the complete results of the tests used to examine the assumptions of multivariate linear regression and determine the appropriate estimation method.

Table 3. Results of regression-assumption tests and model-estimation methods

Assumptions Testing and Estimation Method	Test	Model 1		Model 2		Result
		Statistics	Prob	Statistics	Prob	
Autocorrelation	Wooldridge	11.653	0.000	60.301	0.000	*Autocorrelation is present.
Heteroskedasticity	Modified Wald	30097.94	0.000	11289.01	0.000	Variance is not homogeneous.
Normality	Shapiro-Wilk	11.282	0.000	8.904	0.000	**The residuals are not normally distributed.
Cointegration	Kao	-18.708	0.000	-17.870	0.000	The variables are cointegrated.
Estimation Method	F-Limer	7.877	0.000	6.120	0.000	Both models should be estimated using the fixed-effects method.
	Breusch–Pagan	1037.060	0.000	28.860	0.000	
	Hausman	74.347	0.000	300.333	0.000	

*To address this problem, generalized least squares (weighted) regression was used instead of ordinary least squares. Generalized least squares (weighted) regression can resolve heteroskedasticity in the variances of the variables and autocorrelation among the model residuals (Akpan and Moffat, 2018, and Fox, 2008).
**When the number of observations exceeds 30 and the other classical assumptions are satisfied, non-normality in the distribution of the model residuals cannot be ignored.

4.3. Estimation of Model 1 (Investment Efficiency)

After the assumptions of multivariate linear regression had been tested and the model had been validated as described in the preceding section, the investment efficiency model was estimated from Equation 5 using the fixed-effects method. The estimation results are reported in Table 4. The F-statistic was used to assess the overall significance of the linear regression model. Based on the F-statistic and probability reported in the table (9.49, 0), the model is significant, meaning that at least one of the estimated variable coefficients differs from zero. In addition, the estimated adjusted coefficient of determination is 0.47. This value indicates that the four independent variables and the control variables explain approximately 47 percent of the variation in investment efficiency. The estimated ratio therefore indicates a relatively good relationship between the independent and control variables and the dependent variable.

The Model 1 hypothesis tests at the 95% confidence level show that brand capital has a negative effect on investment efficiency. In other words, as brand capital, measured as the ratio of general and selling expenses and their changes to firm assets, increases, the firm's investment efficiency decreases. The first hypothesis is therefore confirmed. Advertising intensity, however, has a significant positive effect on investment efficiency. More specifically, an increase in effective and targeted advertising improves investment efficiency, and the third hypothesis is therefore also confirmed. Considered together, these results indicate that the general and selling expenses of listed firms, represented by advertising intensity, improve their investment efficiency. By contrast, the growth rate of these expenses is disproportionate and has reduced investment efficiency. The growth rate of each firm's expenses appears in the denominator of base-year brand capital, while brand capital in each year is a function of the firm's brand capital in the preceding year.

The fifth hypothesis examines the relationship between brand age and investment efficiency. According to the results reported in Table 4, brand age has a negative effect on investment efficiency. In other words, as firm age increases, both overinvestment and underinvestment increase, and the

fifth hypothesis is therefore also confirmed. The results also show, however, that the firm's market share improves investment efficiency.

Table 4. Effects of brand capital and brand value-creating dimensions on investment efficiency

Variable	Coefficient	Std. Error	t-Statistic	Prob.	VIF
C	2.374	0.167	14.187	0.000	-
Brand capital	-1.896	0.520	-3.646	0.000	4.823
Advertising intensity	2.748	0.797	3.448	0.001	4.041
Brand age	-0.250	0.065	-3.846	0.000	2.494
Market share	0.861	0.181	4.750	0.000	1.136
Company size	-0.152	0.015	-10.353	0.000	2.689
Profitability	0.111	0.041	2.724	0.007	1.567
Loss	-0.131	0.036	-3.613	0.000	1.089
Financial leverage	0.090	0.063	1.420	0.156	1.253
F-statistic	9.490		Adjusted R-squared	0.471	
Prob (F-statistic)	0.000		Durbin-Watson stat	1.899	

Firms with a higher sales ratio within the industry in which they operate are less likely to overinvest or underinvest. The seventh hypothesis therefore cannot be rejected. The results for the control variables further show that profitability, measured by return on equity, increases investment efficiency, whereas reporting a loss reduces efficiency. In addition, larger firms had lower investment efficiency during the study period.

4.4. Estimation of Model 2 (Asset Growth)

The results of the regression-assumption tests indicated that Model 2 had the validity required to test the relevant research hypotheses. In accordance with the diagnostic tests reported in the preceding section, the model was estimated from Equation 6 using the fixed-effects method, and the results are reported in Table 5. The F-statistic was used to assess the overall significance of the linear regression model. Based on the value and probability of the F-statistic reported in the table (12.926,0), the model is significant, meaning that at least one of the estimated variable coefficients differs from zero. The estimated adjusted coefficient of determination is 0.58. This value indicates that the four independent variables and the control variables explain approximately 58 percent of the variation in the asset growth variable. The estimated ratio therefore indicates a relatively appropriate relationship between the independent and control variables and the dependent variable.

Table 5. Effects of brand capital and brand value-creating dimensions on asset growth

Variable	Coefficient	Std. Error	t-Statistic	Prob.	VIF
C	1.784-	0.151	-11.797	0.000	-
Brand capital	-2.232	0.397	-5.626	0.000	3.997
Advertising intensity	1.225	0.583	2.101	0.036	3.725
Brand age	-0.130	0.052	-2.475	0.014	2.870
Market share	0.670	0.215	3.254	0.001	1.033
Company size	0.163	0.013	12.676	0.000	3.274
Profitability	0.443	0.033	13.287	0.000	1.642
Financial leverage	0.204-	0.051	-4.005	0.000	1.234
Growth opportunity	0.011	0.001	7.044	0.000	1.420
F-statistic	12.926		Adjusted R-squared	0.581	
Prob (F-statistic)	0.000		Durbin-Watson stat	2.134	

The tests of the research hypotheses associated with Model 2 at the 95% confidence level show that brand capital has a negative effect on asset growth. In other words, as the brand-investment ratio, measured as advertising and marketing expenditures divided by assets, increased, asset growth among listed firms declined during the study period. The second research hypothesis is therefore confirmed. In the test of the fourth hypothesis, advertising intensity had a positive effect on asset growth, and this hypothesis is also confirmed. This result means that incurring advertising expenditures in a targeted and efficient manner promotes the growth of firm assets.

According to the results reported in Table 5, brand age has a negative effect on firm asset growth, and the sixth hypothesis is confirmed. In other words, older firms experienced less asset growth. The results also show that the firm's market share improves asset growth. Firms with a higher sales ratio within the industry in which they operate experienced greater asset growth, and the eighth hypothesis therefore cannot be rejected. The results concerning the relationships between the control variables and financial stability show that larger firms experienced greater asset growth and that profitability also had a positive effect on asset growth. Firms with a higher debt ratio, however, experienced lower financial stability, as measured by asset growth. In addition, growth opportunity, measured as the ratio of market value to the book value of equity, increased firm asset growth.

5. Discussion and conclusion

Efficient investment requires managers to select projects with positive net present value and reject those with negative net present value. As long as the marginal benefit of an investment exceeds its marginal cost, undertaking the investment remains rational. Nevertheless, several incentives arising at the market level can cause firms to deviate from optimal investment (Chan et al., 2025). Sales growth and sustainable profitability depend on optimal firm investment, which improves asset growth and financial stability. Sales growth and profitability are most important to all company stakeholders, including customers. Therefore, an investment decision based on consumer wants and preferences leads to better project selection and easier access to financial resources (Liu et al., 2026). Thus, the study looked at two major aspects of company investment objectives. The first is investment intended to introduce and stabilize brand value, and the second is the operational function of investment in the market, which has a significant role in creating value for the firm's brand. The effects of these dimensions and of their determining components on firm investment performance and financial stability were then examined. One innovation of the study is therefore the identification of variables that create value for a firm's brand. A second innovation is the examination of the relationship between the value-creating components of the brand and the investment performance of listed firms. A further innovation is the examination of the effects of these dimensions on firm asset growth and financial stability. Accordingly, the study examined the effects of brand capital, advertising intensity, brand age, and market share on the investment efficiency and asset growth of firms listed on the Tehran Stock Exchange. The hypotheses were tested using data from 151 firms over the 10 years from 2015 to 2024.

The hypothesis tests at the 95% confidence level showed that brand capital has a negative effect on investment efficiency and asset growth. In other words, brand investment expenditures, including advertising and marketing costs together with their annual growth rate, reduced both investment efficiency and asset growth among the sampled firms. The first and second hypotheses are therefore confirmed. These findings are consistent with the results reported by Sull (1999) and Nejadmalayeri et al. (2013), but they are inconsistent with the findings of Liu et al. (2026) and Chan et al. (2025). Sull (1999) concluded that firms with successful brands persist in their established patterns of behavior and competitive strategies, leading to inflexibility and limited innovation. The resulting loss

of competitive advantage creates the conditions for investment inefficiency and for reductions in firm sales and asset growth. Nejadmalayeri et al. (2013) reported that firms with ineffective advertising experience lower liquidity in the bond market and higher debt costs. However, Liu et al. (2026) and Chan et al. (2025) found a beneficial impact of brand capital on investment efficiency. Note that the growth of capital does not necessarily imply that the efficiency of the investment will increase, even if the advertising and marketing expenses grow. Thus, managers should emphasize market orientation and generate brand capital based on market capabilities rather than investing too much in impulsive marketing initiatives. Management must be more geared to client demands and tastes and shareholders and boards should also act to achieve this. They can do so by developing reward plans based on customer acquisition and customer-orientation indicators, thereby providing a basis for sales growth, financial stability, and investment efficiency.

The tests of the third and fourth hypotheses showed that advertising intensity has a significant positive effect on investment efficiency. In other words, effective and targeted advertising and marketing expenditures increase investment efficiency. Advertising intensity also has a positive effect on asset growth, meaning that incurring advertising and marketing expenditures in a targeted and efficient manner promotes asset growth. The third and fourth research hypotheses are therefore confirmed. These findings are in line with Tanveer et al. (2022), who found a favorable relationship between well-managed advertising expenditures and investment efficiency, since these help in better utilization of firm resources and can be a sign of managerial aptitude. Yin et al. (2024) have demonstrated that the direct effect of advertising on investment efficiency is positively affected by competition when firms use a differentiation strategy. In contrast, Wang et al. (2021) demonstrated that a strong emphasis on advertising, as in the downstream part of the value chain, can mislead the market and lead to inefficient investment decisions. Fischer and Himme (2017) have proved that advertising expenditure boosts the consumption of the product by communicating the brand-specific qualities and developing a favourable perception among the customers, which consequently contributes to sales growth and, in turn, to the firm's financial stability and financial health. Given the positive effect of advertising expenditure on investment efficiency and financial stability, managers, consultants, and analysts are advised to estimate the firm's optimal level of advertising and marketing expenditure and incorporate it separately into share-price analysis. The positive effects of advertising and marketing expenditure on investment efficiency and asset growth imply that reducing such expenditure sends a negative signal to the market, although excessive expenditure will not generate additional sales. Investors should therefore not view these expenditures, from a short-term perspective, as activities that fail to create added value. Instead, they should adopt a long-term perspective, regard them as value-creating capital expenditures, and make decisions to buy or sell the firm's shares on that basis.

The tests of the fifth and sixth hypotheses showed that brand age has a negative effect on investment efficiency. In other words, as firm age increases, both overinvestment and underinvestment increase. Brand age also has a negative effect on firm asset growth, meaning that older firms experienced less asset growth. Thus, the fifth and sixth assumptions are verified. These results are consistent with Loderer and Waelchli (2009), Haykir and Çelik (2018) and Mallinguh et al. (2020). The findings of these studies indicated that the sales growth of enterprises was diminishing over time because of organizational rigidity and resistance to rapid and complicated market changes, which led to increased expenses and reduced operating efficiency. The older enterprises also lose their competitive edge due to the depreciation of fixed assets and the introduction of powerful competitors in the market, causing financial instability. It is recommended for managers and consultants of the older enterprises to change the strategy of the firm to maintain competitive advantage, adopt new technologies and replace depreciated machinery and equipment.

The tests of the seventh and eighth hypotheses demonstrated that the firm's market share improves investment efficiency. Companies that have a greater sales ratio in the industry are less likely to overinvest or underinvest. Market share enhances financial stability, and enterprises with higher ratios of industry sales had larger increases in assets. Therefore, the seventh and eighth hypotheses are verified. This is consistent with Arianpoor (2025) and Peng et al. (2021), who showed that a bigger market share reduces the manufacturing costs per unit and boosts the investment efficiency of the firm. Liu et al. (2024) and Stoughton et al. (2017) similarly find that a greater proportion of the product market can minimize the investment risk of enterprises with a wider client base. Marketing managers are recommended to identify the prospective market of the product and effectively estimate consumer wants in an effort to acquire new customers and grow firm sales. In addition, managers and operators of firms should be able to attract new customers and increase the loyalty of existing customers by targeting research and development expenditures at the manufacture of items that go beyond client expectations.

In addition to the practical recommendations arising from each hypothesis test, this study contributes theoretically to the development of the literature on brand investment and corporate brand value creation. It also helps direct advertising and marketing expenditures, improve corporate strategy, and explain the role of customers in the growth of firm assets. By identifying the value-creating components of a firm's brand, the study further clarifies the role of these factors in asset growth and in the direction of investment. Future research could examine the effects of upstream activities that create value for the firm's brand, such as research and development expenditures, on investment efficiency and the employee productivity ratio. Future studies could also examine the effect of firm-specific characteristics, such as firm size, on the relationship between the value-creating dimensions of the firm's brand and investment efficiency. The principal limitation of the study was that most sampled firms did not separately disclose advertising and marketing expenditures within total operating expenses. Estimates of these expenditures were therefore used in the analysis.

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