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The Mediating Effect of Information Asymmetry and Agency Costs on the Relationship Between CSR and Investment Efficiency

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ABSTRACT

The purpose of the present study is to investigate the relationship between corporate social responsibility and investment efficiency with particular emphasis on the mediating role of agency cost and information asymmetry in a sample of 121 firms listed on the Tehran Stock Exchange during the time period from 2012 to 2017. The research hypotheses are tested using multivariate regression analysis based on panel data and Eviews software. The results indicate that corporate social responsibility is negatively correlated with investment inefficiency. In other words, corporate social responsibility leads to reduced investment inefficiency. Also, information asymmetry plays a mediating role in the relationship between corporate social responsibility disclosure and underinvestment, whereas the variable of agency cost mediates the association between corporate social responsibility disclosure and overinvestment.

1 Introduction

In an efficient financial market where financial decisions are made regardless of financial conditions, firms are required to fully undertake positive net present value projects and refrain from engaging in negative net present value projects [55, 71]. They also need to run certain investment so as to maximize their values until the equilibrium level of income-expenditure is achieved [39]. Nevertheless, a long history of literature has renounced the postulate [13,41,64]. Barriers to capital market can be exploited by managers to make optimal investment decisions. This suggests that firms may not hold optimal level of investment. Previous studies have propounded two major factors contributing to the deviation of firms from anticipated and optimal level of investment: free cash flow [45,37] and information asymmetry [9,35,55]. These factors are argued to trigger various forms of deviation during investment decision making process; free cash flow induces overinvestment, though information asymmetry among shareholders is attributable to underinvestment. According to agency theory, various monitoring mechanisms including corporate social responsibility (henceforth, CSR) can diminish managerial opportunistic behaviors and information asymmetry [24,53,69]. Therefore, CSR can be employed to approach the problems of overinvestment and underinvestment. A couple of scholars have dissected the different merits of CSR activities and ultimately verified their significant association with increased firm value [51], reduced financial constraints [15], diminished investment free

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cash flow sensitivity [5], improved information quality [15,19,53] and mitigated agency conflicts [69,38,24].

On the other hand, as CSR reduces information asymmetry [18, 52], and high levels of transparency allow managers to make better investment decisions, Thus, facilitating effective capital allocation. [35] CSR is expected to reduce underinvestment through lack of information asymmetry. Goarigli and Young [37] research also showed that one of the reasons for the inefficiency of investing is agency problems and that managers prefer to invest in free cash flow over projects with negative net present value instead of paying dividends to shareholders. Work leads to the problem of over-investing. The Conflict Resolution Hypothesis and the Good Management Hypothesis state that CSR reduces the conflict of interest between different stakeholders and limits the amount of free cash flow available [44,10,63]. In fact, CSR can lead to more investment by reducing agency problems. Along similar lines, the current study is concerned with investigating the effect of CSR activities on investment decisions. It aims to scrutinize the association between firm's investment decisions and its engagement in CSR activities in the Iranian capital market. It particularly highlights how CSR activities influence investment efficiency. In other respects, the present research seeks to identify the channels through which CSR activities contribute to appropriate allocation of capital resources. Despite the fact that previous literature has investigated the direct correlation between CSR and investment efficiency [62,8,30,67], the current article focuses its attention on considering the direct and indirect association between CSR and investment efficiency. Baron and Kenny [6] mediation approach is adopted to examine how CSR affects corporate investment efficiency. The present study seeks to detect whether this effect happens via reducing the agency costs of free cash flow or mitigating information asymmetry between insiders or outsiders. The results of the study are expected to provide the following implications. First, the results can extend the theoretical background of the literature concerning investment efficiency in the developing countries like the Iranian emerging market. Second, the current study devises a communication mechanism like reducing such capital market pitfalls as information asymmetry and agency costs between CSR disclosure and investment efficiency to provide investors, capital market regulators, accounting standard setters and other accounting information users with informative documents.

2 Theoretical Framework

2.1 CSR and Investment Efficiency

Following the new classic theory, firms are required to undertake all positive net present value projects and refrain from engaging in negative net present value projects [48,54]. They also need to conduct certain investment to maximize their values until the equilibrium level of income-expenditure is achieved [38]. Nevertheless, a long history of literature has renounced the postulate [41,64,13]. The potential pitfalls in a capital market together with its sensitivities are likely to hinder managers from accepting all profitable projects. As such, firms may diverge from an optimal level of investment, thereby leading to overinvestment or underinvestment. Underinvestment occurs when firms fail to engage in profitable projects due to financial constraints. In contrast, overinvestment is concerned with the situation in which managers, who pursue their personal benefits, adopt negative net present value projects to avail themselves of acquisition. Therefore, firms with financial constraints face up with more severe underinvestment [11,41]. CSR tends to play a pivotal role in making strategic in-

vestment decisions through influencing corporate financial constraints. Engaging in superb CSR activities facilitates external financing [15], hence allowing firms to undertake appropriate investment projects [64].

On these grounds, El-Ghoul et al. [26,27] propound the view that firms with higher CSR scores may benefit from cheaper financing via selling their stocks. Examining the advantages of voluntary disclosure of CSR activities, Dalival et al. [22] are inclined to believe that firms with high quality CSR activities not only benefit from the fall in the cost of net assets, but also are appealing to private investment companies and economic analysts. Sherfman and Fernando [65] put forward the view that firms are compensated by financial markets provided that they pursue to improve their environmental risk management. Likewise, Nandy and Lodh [57] advance the argument that eco-friendly companies with better environmental scores avail more favorable and appropriate loan transactions than their non-eco-friendly counterparts. Thus, CSR is a major determinant in the cost of bank debt. El-Ghoul et al. [27] develop the claim that CSR performance is significantly correlated with improved access to financial resources, lower risk of non-payment (loan or liability), and long-run credit in countries with poor economic conditions. Attig et al. [5] lend support to the view that CSR performance tends to diminish the sensitivity of investment cash flow. Benlemlih and Bitar [8] document that CSR activities are major contributors to the decrease in investment inefficiency. Taghizadeh khanghah and Zeinali [67] and Fakhari et al. [30] also argue that improving CSR activities is likely to result in the enhancement of investment efficiency. Furthermore, Samet and Jaryubi [62] provide confirmatory evidence on the negative effect of CSR disclosure on corporate investment inefficiency. Therefore, the first hypothesis is developed as follows:

Hypothesis 1: CSR disclosure diminishes the level of corporate investment inefficiency

2.2 CSR, Information Asymmetry and Investment Efficiency

Jensen and Mcling [43], Myers and Majlouf [56] develop a framework to explain the role of information asymmetry in making investment decisions with respect to information problems including adverse selection and moral hazards. Adverse selection occurs when markets are not properly informed about the quality of firms and projects. This may lead capital suppliers to divide the provided capital or raise its cost [64]. Consequently, this may compel firms to give up investment due to financial shortcomings, and hence underinvestment. Moral hazard takes place when managers exploit corporate resources to their own benefits. In pursuit of this goal, they undertake projects which are not advantageous to shareholders, thereby resulting in overinvestment. A growing body of literature examines the impact of information asymmetry on investment efficiency. Firms with higher financial information quality enjoy less deviation form optimal level of investment [9,14,35]. Higher level of transparency assists managers in making more informed investment decisions, thus facilitates more favorable resource allocation. According to the agency theory, various mechanisms, including CSR, are devised to reduce information risk. Following Cho et al. [18], CSR performance plays a pivotal role in enhancing investment through reducing information asymmetry. Moreover, regulatory practice is advisable in decreasing adverse selection besetting less informed investors. Attig et al. [5] put forward the claim that CSR performance can communicate significant non-financial information, which may cut down the cost of finances resulting from high credits. Lopatta et al. [53] provide ample support for the assertion that CSR significantly enhances information quality. They reveal that CSR activities tend to increase firm's credit value via improving moral standards, transparency and income

quality, which in turn results in a drop in information asymmetry. Indeed, firms with higher CSR performance temp managers to release higher quality financial reporting and reduce earning management [49]. Cui et al. [19] conduct a study on an American sample and conclude that information asymmetry is inversely associated with CSR activities. Accordingly, shareholder theory supports the view that CSR activities is a sound instrument to create and shield firm's reputation. This is in line with the findings of Attig et al. [5], who assign an international scope to the CSR activities. As firms enter a foreign market, they tend more to engage in CSR activities to level up their credit. In fact, multinational firms do receive a flood of media's attention, and their CSR activities are significantly influenced as well [28]. Samet and Jarbuyi [59] also provide ample evidence to approve the mediating role of information asymmetry in the association between CSR and underinvestment. Therefore, the second hypothesis is developed as follows:

Hypothesis 2: diminished information asymmetry plays a mediating role in the relationship between CSR activities and underinvestment.

2.3 CSR, Agency Cost and Investment Efficiency

Agency problems are argued to loom when managers or controlling shareholders exploit corporate resources to their personal benefits and at the expense of minority shareholders [6,21,23,34,40,43]. It is argued that agency conflicts between management and shareholders on the one hand, and controlling shareholders and minority shareholders on the other hand, exert significant effect on corporate investment decisions [31,44,46,54,56]. Investment inefficiency, which may stem from investment cash flow sensitivity, seems to be severe for firms with critical agency problems. Goergen and Renborg [36] seek to perceive whether investment cash flow sensitivity varies for firms with different levels of ownership. They demonstrate that the presence of major shareholders can mitigate unfavorable investment. Degryse and Jong [20] indicate that the sensitivity of cost of investment to internal financing can be attributable to overinvestment which results from mismanagement. Andern and Jankensgard [3] conclude that investment cash flow sensitivity in large firms rises in the period of prosperity. They suggest that this relationship originates in the agency problems associated with free cash flow. This conforms to the findings of Pawlina and Renneboog [59] who support the free cash flow theory as the major source of investment cash flow sensitivity. Guariglia and Yang [37] provide ample evidence to accentuate the investment inefficiency caused by agency problems in the Chinese market. Managers or controlling shareholders assume the control of corporate resources through making inappropriate, self-beneficial decisions. Therefore, they prefer to spend the free cash flow on negative net present value projects rather than to distribute dividends, thereby resulting in overinvestment. The theory of conflict resolution is grounded on the assumption that firms undertake CSR investments to mitigate the conflict among various shareholders to maximize shareholders' wealth [45,10,63]. The adoption and implementation of CSR strategies tend to curb the existing level of free cash flow, which can be exploited by managers who follow their personal benefits to undertake non-for-profit projects [44]. The monitoring role of CSR is supported by the so-called good management theory developed by [69]. As such, CSR investment improves shareholders' fundamental communications including social and staff communications. Recently, a stream of literature has focused on the role of CSR in diminishing agency problems. Aribi et al. [4] scrutinize the factors inducing firms to invest in CSR activities. They find out that firms with higher cash flow engage in more CSR activities. Harjoto and Jo [38] confirm that firms which employ public mechanisms as well as CSR

activities to tackle with the conflicts between managers and those shareholders without investment enjoy more favorable firm value. Eccles [24] investigates the integration of social and environmental issues into a corporate strategy, and reveals that highly sustainable firms are more likely to avail formal shareholders, which circumscribes short-term opportunistic behaviors. El-Ghoul et al. [28] find out that lower CSR performance in family firms is associated with greater agency problems, hence conforming to takeover theory. Samet and Jaryubi [62] also come up with this conclusion that financial investment inefficiency stems from a drop in the agency problems of free cash flow. Free cash flow problems are typically correlated with overinvestment. Reduced agency problems play a mediating role in the relationship between CSR and overinvestment. Thus, the third hypothesis is designed as follows:

Hypothesis 3: reduced agency problems play a mediating role in the relationship between CSR disclosure and overinvestment.

2.4 Literature Review

Nofsinger et al. [58] investigated the relationship between institutional investors and corporate social responsibility, and the results of their research showed that institutional investors lead to increased corporate social responsibility. Tao et al. [68]. In their research found that institutional shareholders lead to increased corporate social responsibility. Overall, the results showed that institutional shareholders can create real social impact. Li et al. [51] Using contextual analysis, the risk disclosure index of the annual reports examined the relationship between risk disclosure and investment efficiency, and their research results showed that the higher the risk exposure frequency, the greater the investment efficiency of the company. The research results support the convergence argument for risk disclosure. Du et al. [24] Using a dataset of 8.5 million European companies, they showed that high-debt firms invest more than other companies if they operate in sectors with good global growth opportunities. At the same time, the positive effect of increasing the debt margin on investment efficiency if the company 's debt is excessive, if it overcomes short - term maturities during a systemic banking crisis. Our results are consistent with prominent theories of the disciplinary role of debt on equity. Aflatooni and mansouri [1] show that the increase in information opacity increases (decreases) the positive (negative) deviation from target leverage. In addition, research findings indicate that the increase in information opacity decreases the adjustment speed. Aghaei and Hasanzadeh [2] carry out an investigation into accounting comparability and its impact on investment efficiency. The evidence confirms the presence of a significantly positive relationship between accounting comparability and investment efficiency. To put it differently, accounting comparability facilitates the access to high quality accounting information, and thereby leading to an improvement in investment decisions. Ghaderi et al. [32] consider the possible linkage between managerial overconfidence and efficiency of corporate risk management for a sample of 115 firms listed on the Tehran Stock Exchange and conclude that the methodology of organizational risk management is greatly influenced by managerial overconfidence and behavioral bias, hence losing its efficiency. Samet and Jarboui [62] undertake a study on the relationship between CSR and investment efficiency. Their findings lend support to the fact that improved CSR increases investment efficiency. In underinvesting firms, CSR helps enhance the level of investment via reducing information asymmetry. Likewise, in overinvesting firms, CSR contributes to the reduction of overinvestment by diminishing free cash flow problems. Wang et al. [71] scrutinize the association between managerial overconfidence the level of research and development expenditures of the firms listed on the China Stock Exchange. Having sampled 6465 firm-year

observations during the years 2010-2014, they reveal that managerial overconfidence triggers an enhancement in the quantity of the firms' research and development expenditures. Chan et al. [12] seek to examine whether dividend policy influences investment efficiency of the Chinese firms. Their findings suggest that dividend payment can push up investment efficiency, particularly through minimizing overinvestment. Kim et al. [49] support the notion that dividend payment policy not only improves financial reporting quality and investment efficiency, but also reverse the increase of stock price crash risk via circumscribing bad news withholding. They also demonstrate that dividend payment can mitigate overinvestment. Ghiabi [33] Examining the Relationship between Social Responsibility and Disclosure of Remuneration Paid to Board of Directors and result show that there is a reasonable relationship between the factors social responsibility (employed relations and social participation) and Board Bonus. Fakhari et al. [30] examine the effect of CSR disclosure on investment efficiency. They reveal that CSR disclosure improves the corporate investment efficiency. Being verified by stakeholder's theory, their findings zero in on the paramount role of CSR in forming investment behavior and its efficiency. Wang et al. [70] examine the correlation between financial reporting quality and investment efficiency, as well as the mutual effect of financial reporting and free cash flow on investment efficiency. They validate the claim that financial reporting quality is negatively correlated with overinvestment and underinvestment. In addition, financial reporting quality has a robust relationship with the overinvestment of the firms with higher free cash flow, i.e. financial reporting quality can attenuate the information asymmetry between managers and shareholders.

3 Research Methodology

retrospective study Quasi-Experimental Designs, the current research uses multivariate regression method and econometrics models to test the hypotheses. The statistical population is composed of all firms listed on the Tehran Stock Exchange during the years 2012-2017. This sample needs to meet the following conditions:

1.They are listed on the Tehran Stock Exchange prior to 31 March, 2012 and continue to 2017. Furthermore, as investment efficiency is computed based on the data collected in the field for the last two years, the required data need to be available for a period of 8 years (2010-2017).

2. To increase comparability, their fiscal year ended in March

3.No changes in their fiscal year or activities happened during this period.

4.They are not included in financial intermediaries and investment companies.

5.The necessary data are available to calculate the research variables.

After applying the above limitations, a sample of 121 firms are selected. The research data are elicited from the financial statements and explanatory notes of the listed firms via Stock Exchange websites and Rahavard Novin software. The final data are analyzed using Eviews software.

4 Research Models and Variables

The model employed by Samet and Jarboui [62] serves as the tool to test the research hypothesis:

To test the first research hypothesis, the following regression model is adopted:

$$INVEFF_{i,t}=\beta_0+\beta_1 CSR_{i,t}+\beta_2 INST_{i,t}+\beta_3 AGE_{i,t}+\sum\beta_j INDUSTRY_{i,t}+\sum\beta_k YEAR_{i,t}+\varepsilon i,t \quad (1)$$

To test the second research hypothesis, Baron and Kenny [6] mediation method is employed. In the first stage, the effect of underinvestment (UNDER), as the dependent variable, on CSR is evaluated. The second stage is concerned with examining the mediating impact of variable information asymmetry (SPREAD) on CSR. Finally, the effect of CSR and SPREAD on UNDER is computed. Therefore, the second hypothesis is calculated in terms of three conceptual frameworks as follows:

$$UNDER_{i,t}=\beta_0+\beta_1 CSR_{i,t}+\beta_2 INST_{i,t}+\beta_3 AGE_{i,t}+\varepsilon_{i,t} \quad (2)$$

$$SPREAD_{i,t}=\beta_0+\beta_1 CSR_{i,t}+\beta_2 INST_{i,t}+\beta_3 AGE_{i,t}+\varepsilon_{i,t} \quad (3)$$

$$UNDER_{i,t}=\beta_0+\beta_1 CSR_{i,t}+\beta_2 SPREAD_{i,t}+\beta_3 INST_{i,t}+\beta_4 AGE_{i,t}+\varepsilon_{i,t} \quad (4)$$

Table 1: The Sampling Process

Description	Number of firms
All firms listed on the stock exchange until the end of 2017 [1]	351
All firms not listed on the stock exchange since the beginning of 2011, and left the exchange at the end of 2017.	(68)
their fiscal year does not end in March	(59)
no changes in their activities and fiscal year	(35)
An intermediary or investment company	(59)
the necessary data to compute the research variables are not available	(9)
the final sample	121

To test the third hypothesis, three various regression models are adopted to estimate the mediating role of agency cost (free cash flow) as follows:

$$OVER_{i,t}=\beta_0+\beta_1 CSR_{i,t}+\beta_2 INST_{i,t}+\beta_3 AGE_{i,t}+\varepsilon_{i,t} \quad (5)$$

$$FCF_{i,t}=\beta_0+\beta_1 CSR_{i,t}+\beta_2 INST_{i,t}+\beta_3 AGE_{i,t}+\varepsilon_{i,t} \quad (6)$$

$$OVER_{i,t}=\beta_0+\beta_1 CSR_{i,t}+\beta_2 FCF_{i,t}+\beta_3 INST_{i,t}+\beta_4 AGE_{i,t}+\varepsilon_{i,t} \quad (7)$$

Dependent variable: Following Gomariz and Ballesta [34] and Samet and Jarboui [59], investment inefficiency serves as the dependent variable of the present study. It is calculated as the deviation from expected investment level based on the model developed by Chen et al. [14] as follows:

$$Investment_{i,t}=\beta_0+\beta_1 NEG_{i,t-1}+\beta_2 Sales\ Growth_{i,t-1}+\beta_3 NEG_{i,t-1}*Sales\ Growth_{i,t-1}+\varepsilon_{i,t} \quad (8)$$

Where

$Investment_{i,t}$: the sum of investment for firm i in year t, which is computed via dividing net increase in tangible and intangible assets by the total assets at the beginning period.

[1] In the latest update of the firms listed on the Tehran Stock Exchange website, many old firms which no longer engage in any kinds of transactions, but are still included in the list are omitted, thereby resulting in the significant fall of the number of firms. The list is available at: http://tse.ir/listing.html

Sales Growth $_{i,t-1}$: as a dummy variable, it takes the value of 1 if sales grows is negative, 0 otherwise.

The investment model is estimated for each industry-year. The regression residual exhibits the deviation from the expected investment level, which proxies for investment inefficiency. The positive residual implies that more-than-expected real investment points to a scenario of overinvestment. In contrast, a negative residual reveals that a firm engages in less-than-expected investment with respect to the sales growth, hence underinvestment. The absolute value of the regression model accounts for high investment efficiency.

Independent variables

CSR disclosure level is adopted as the independent variable, which is calculated using content analysis. Content analysis is a method to code a text based on certain predefined criteria, which are widely used in the literature associated with environmental and social information disclosure. Researchers apply this systematic method to analyze large non-structural data [42]. According to this methodology, a researcher is supposed to employ a coding checklist to evaluate the environmental and social information disclosure level [4]. The proposed checklist is devised to code the qualitative information included in annual reports [73]. The coding method includes such stages as reading annual reports, identifying the information related to environmental and social issues, and finally classifying it into various parts and sub-parts. To measure corporate environmental and social information disclosure level, the researchers contrive a checklist of 23 items concerning environmental and social issues which are voluntarily or obligatorily disclosed in the Iranian annual reports. As such, if the CSR information contained in the annual reports is released by firms, it is assigned he value of 1, 0 otherwise. Eventually, the sum of all the scores given to various dimensions of CSR is computed as the firm's CSR disclosure level. The final checklist is as follows:

Environmental issues: pollution control, avoiding environmental damages, recycling or avoiding waste disposal, natural resource preservation, research and development, environmental policy, investment in environmental projects, other environmental issues.

Products and services: product development/market share, product quality/ISO, product safety or health, cessation of production, other products and services.

Staff: union relations, cash income, staff participation, safety health, pension benefits, other customers.

The responsibilities of the community: social investment, advocating the society's activities, donations, legal actions/ legal proceedings, religious/cultural activities, other responsibilities of the society.

Mediation Variables

Information Asymmetry

The model developed by Venkatesh and Chiang [68], and applied in a couple of studies including Kanagaretnam et al. [47], Cheng et al. [16], Cho et al. [18and Samet and Jarboui [62] is adopted to compute information asymmetry. In Iran, Behbahninia and Masumi [7] and Fakhari and Kabiri [29] employ this instrument to measure information asymmetry.

$$\mathrm{SPREAD_{it}} = \frac{(\mathrm{AP}-\mathrm{BP})}{(\mathrm{AP}+\mathrm{BP})/2} * 100 \tag{9}$$

where SPREAD denotes the spread for firm i in year t, AP is the mean of ask price for firm i in year t, BP refers to the mean of bid price for firm i in year t. Accordingly, the higher the spread, the greater the information asymmetry.

Agency Cost

The conflict of interests between managers and shareholders deteriorates when firms engender considerable cash flow [44]. The availability of free cash flow governed by corporate management provokes investment in non-value added projects, and overinvestment, thereby increasing shareholders' costs. Following Chi and Lee [17] and Samet and Jarboui [62] and Rezaei Pitenoei and Gholamrezapoor [59], the present research employs free cash flow to proxy for the potential agency cost. Therefore, the model developed by Lehn and Poulsen [50] and undistributed cash flow serve as the measures of calculating free cash flow. Free cash flow is considered as a benchmark to measure the performance of companies and it is important in terms that allow the company to seek opportunities to increase shareholder value [61]. Accordingly, free cash flow is calculated by subtracting operational income from the sum of income tax payable, interest payable, common stock dividend payable, and preferred stock dividend payable. To homogenize free cash flow, this variable is divided by book value of total assets. According to the discussed model, free cash flows are computed as follows:

$$FCF_{i,t} = (INC_{i,t} - TAX_{i,t} - INTEP_{i,t} - PSDIV_{i,t} - CSDIV_{i,t}) / A_{i,t-1} \tag{10}$$

Where:

$FCF_{i,t}$: free cash flows of firm i in year t, $INC_{i,t}$: operational income for firm i in year t, $TAX_{i,t}$: total tax payable for firm i in year t, $INTEP_{i,t}$: interest payable of firm i in year t, $PSDIV_{i,t}$: preferred stock dividend payable for firm i in year t, $CSDIV_{i,t}$: common stock dividend payable for firm i in year t, $A_{i,t-1}$: book value of total assets for firm i in year t-1.

Table 2: Descriptive Statistics of Research Variables

Variables	Obs.	Mean	Median	Minimum	Maximum	Std. Deviation
INVEFF	726	0.070	0.043	0.001	1.233	0.124
CSR	726	5.614	5	3	18	2.642
INST	726	0.71	0.76	0.08	0.99	0.192
AGE	726	17.418	17	3	49	7.871
UNDER	423	-0.047	-0.042	-0.387	-0.001	0.038
SPREAD	423	0.745	0.693	0.013	1.723	0.345
OVER	303	0.102	0.044	0.001	1.233	0.183
FCF	303	0.225	0.195	-0.781	0.669	0.169

Control variables

institutional investment: calculated through dividing the sum of the shares owned by banks, insurance companies, investment firms, pensions, financing firms, investment funds, organizations and state agencies by the sum of the stocks issued [60].

Firm age: it refers to the time period between when a firm is listed on the stock exchange and end of the research period.

5 Empirical Results

5.1 Descriptive Statistics

To investigate the general characteristics of the variables and estimate and analyze the research model and data, the descriptive statistics including some central indices of dispersion is illustrated for a sample of 726 firm-year observations during the years 2012-2017 in Table 2. As tabulated in Table 2, the mean of institutional ownership equals 0.71, suggesting that approximately 71 percent of the shareholders are institutional owners. Moreover, the average age of the sample firm is 17.

5.2 Regression Results

In the panel data, the F-Limer test is first used to determine whether the data are pooled or panel data. According to the results presented in Table 3, the level of significance of the F-Limer statistic for all models is less than 0.05, so the null test hypothesis is rejected and indicates that the method of estimation should be used to estimate the research models. Use panel data. Then, given the model's panel layout, the Hausman test should be used to determine the panel data type (fixed or random effects method). As shown in Table 3, fixed effects methods are used for models with a significance level less than 0.5, and models that are more than random effects. The results of the Breusch-Pagan test for investigating the assumption of variance homogeneity in the disruption components of the research models are also shown in the table, with models with a significance level less than 0.5 using GSL and models with a significance level greater than 0.5. Is used by the OSS method

Table 3: Results of Testing the First Hypothesis

Model	Observations	F-Limer		Hausman		Breusch-Pagan	
		F-statistic	Prob.	Chi-Sq. Statistic	Prob.	F-statistic	Prob.
1	726	5.182	0.000	21.655	0.000	0.525	0.664
2	423	1.534	0.007	23.332	0.000	0.621	0.601
3	423	1.927	0.000	21.238	0.000	0.948	0.417
4	423	4.543	0.006	23.908	0.000	0.561	0.691
5	303	2.162	0.002	10.260	0.216	0.814	0.488
6	303	2.868	0.000	8.625	0.234	0.322	0.475
7	303	2.014	0.004	7.488	0.112	4.765	0.001

Also, in order to ensure that there is no coincidence problem between the explanatory variables, the Variance inflation factor (VIF) was tested. does not have. The results of testing the first hypothesis are represented in Table 4.

Table 4: Results of Testing the First Hypothesis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.160	0.073	2.183	0.029
CSR	-0.028	0.014	-2.067	0.039
INST	-0.035	0.065	-0.545	0.585
AGE	-0.006	0.002	-2.283	0.022
F-statistic	5.164	Durbin-Watson stat		2.302
Prob(F-statistic)	(0.000)	Adjusted R-squared		0.187

The obtained values of f-statistics confirm the general significance of the fitted regression model at 5% level. The values of Durbin-Watson statistics also point to the lack of autocorrelation among the residuals. As noted above, the estimated coefficient and t-statistics of the variable of CSR is computed negative at 5 percent level of significance, confirming the presence of a negative relationship between CSR and investment inefficiency at 95 percent level of significance. Therefore, the research hypothesis is accepted at 5% level. The results of testing the second hypothesis are represented in Table 5.

Table 5: Results of Testing the Second Hypothesis

Variable	model 2		model 3		model 4	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
C	-0.056	0.000	0.646	0.000	-0.051	0.000
CSR	–0.003	0.000	-0.002	0.007	-0.003	0.000
SPREAD	---	---	---	---	-0.112	0.015
INST	-0.035	0.008	0.049	0.702	-0.035	0.009
AGE	0.001	0.024	0.002	0.398	0.001	0.021
F-statistic	1.540		2.941		1.592	
Prob(F-statistic)	0.005		0.000		0.002	
Durbin-Watson stat	2.268		2.409		2.282	
Adjusted R-squared	0.25		0.240		0.262	

As illustrated in the table, the values of f-statistics support the general significance of the fitted regression model at 5% level. The values of Durbin-Watson statistics also point to the lack of autocorrelation among the residuals. As tabulated, the estimated coefficient and t-statistics of the variable of CSR disclosure in the second and third models is significant at 5 percent level. Likewise, the estimated coefficient and t-statistics of the variables of CSR disclosure and information asymmetry in the fourth model is significant at the same level, suggesting the mediating effect of information asymmetry on

the association between CSR and underinvestment. Thus, the research hypothesis is accepted at 5% level. The results of testing the third hypothesis are represented in Table 6.

Table 6: Results of Testing the Third Hypothesis

Variable	model 5		model 6		model 7	
	Coefficient	**Prob.**	**Coefficient**	**Prob.**	**Coefficient**	**Prob.**
C	0.135	0.013	0.220	0.000	0.190	0.000
CSR	-0.056	0.047	-0.075	0.006	-0.025	0.001
FCF	---	---	---	---	-0.303	0.000
INST	-0.059	0.300	0.102	0.052	-0.011	0.837
AGE	0.135	0.013	-0.003	0.010	-0.001	0.182
F-statistic	5.755		4.396		6.702	
Prob(F-statistic)	0.000		0.004		0.000	
Durbin-Watson stat	1.901		1.863		1.976	
Adjusted R-squared	0.222		0.232		0.240	

As indicated in the table, the values of f-statistics support the general significance of the fitted regression model at 5% level. The values of Durbin-Watson statistics also point to the lack of autocorrelation among the residuals. As tabulated, the estimated coefficient and t-statistics of the variable of CSR disclosure in the fifth and sixth models is significant at 5 percent level. Likewise, the estimated coefficient and t-statistics of the variables of CSR disclosure and agency cost (free cash flow) in the seventh model is significant at the same level, verifying the mediating effect of agency cost (free cash flow) on the association between CSR and overinvestment. Thus, the third hypothesis is accepted at 5% level.

6 Conclusions

Does the development of CSR strategies influence investment decisions? If so, How? The present research samples a number of firms listed on the Tehran Stock Exchange during the years 2012-2017 to answer the question. In the first phase, the direct effect of CSR disclosure on investment efficiency is scrutinized. In the pursuit of this goal, the scenarios are divided into overinvestment and underinvestment. In overinvesting firms, the mediating impact of agency costs (free cash flow) on the association between CSR disclosure and overinvestment, whereas, in underinvesting firms, the mediating effect of information asymmetry on the association between CSR disclosure and underinvestment are discussed. The results of testing the first hypothesis reveal that CSR disclosure mitigates the investment inefficiency level. This suggests that the higher the firms take part in CSR activities, the greater the investment efficiency and the lower investment inefficiency would be. CSR is a mechanism which exerts significant effect on managerial investment and decisions so that managerial opportunistic behaviors reduce due to their accountability to stakeholders, thereby resulting in higher information transparency and financial reporting quality. Fazzari [31] are inclined to believe that failing to meet stakeholders' expectations is likely to provoke a kind of aversion in the marketplace, and thus minimizes the lucrative opportunities for firms. Firms seek to improve their financial performance through optimal investment to exhibit more favorable accountability to their stakeholders. Investment effi-

ciency is a crucial approach in firms with high CSR to promote their financial performance. The obtained results are in compliance with those generated by Samet and Jarboui [61] and Benlemlih and Bitar [8], pointing to the negative effect of CSR on investment inefficiency, and are in conformity to those yielded by Fakhari et al. [30] and Taghizadeh and Zeinali [66], confirming the positive effect of corporate CSR on investment efficiency. The second hypothesis is concerned with the mediating effect of information asymmetry on the correlation between CSR and underinvestment. The results of testing this hypothesis reveal that information asymmetry plays a mediating role in the relationship between the mentioned variables, i.e. underinvesting firms enhance their investment level through decreasing information asymmetry. Indeed, CSR disclosure contributes to the transparency of information environment, thereby mitigating the information asymmetry among shareholders. Improved information environment leads to a rise in investment level, and hence preventing underinvestment. These findings comply with those of Samet and Jarboui [59]. The third hypothesis seeks to test the mediating effect of agency cost on the connection between CSR and underinvestment. The results of testing this hypothesis demonstrate that agency cost plays a mediating role in the relationship between the mentioned variables, i.e. overinvesting firms attenuate overinvestment via decreasing information asymmetry (free cash flow). In fact, CSR disclosure compromises the level of free cash flows, which is exploited by opportunistic managers to undertake non-profit projects. Therefore, the monitoring role of CSR disclosure averts corporate overinvestment. This is in line with what Samet and Jarboui [61] document. Given the results of the study, the following recommendations are made to overcome the existing obstacles:

1- Given the presence of a negative relationship between CSR disclosure and investment inefficiency, those investors who place an important value on investment efficiency level are recommended to devote a particular attention to CSR disclosure level and count it as a factor contributing to the effect of investment efficiency and inefficiency on their investment decisions.

2-Regarding the mediating effect of agency cost and information asymmetry on the correlation between CSR disclosure and investment efficiency, investors and stock exchange activists are suggested to consider the level of agency cost (free cash flow) and information asymmetry simultaneously.

3-Considering the role of corporate CSR, accounting standard setter's committee is recommended to devise an appropriate standard in this regard.

4-Stock Exchange, as a monitoring institution, is suggested to set certain guidelines to lay on the ground for enforcing compensation policies to motivate firms to release more CSR information.

5-Given the paramount importance of CSR disclosure, Tehran Stock Exchange is suggested to rank the listed firms according to their CSR disclosure level to establish a competitive environment among the firms.

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