



The Influence of Corporate Diversification on Investment Efficiency with an Emphasis on Agency Costs

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Abstract

The objective of this research is to investigate the influence of corporate diversification on investment efficiency with an emphasis on agency costs, for the companies that are listed on Tehran Stock Exchange. In this vain, 110 companies were selected for the period between 2014 and 2019. This is applied and after-the-fact research. The mixed data approach and statistical software “Eviews” were used in order to test the research hypotheses. Results showed that there is a significant and negative relationship between corporate diversification and investment efficiency. In other words, an increase in corporate diversification will lead to increased deviation from optimal investment and decreased investment efficiency. Moreover, results showed that agency costs affect the relationship between corporate diversification and investment efficiency. In fact, there is a negative relationship between corporate diversification and investment efficiency in companies with agency costs. Hence, agency costs intensify the negative relationship between corporate diversification and investment efficiency.

Keywords: *Corporate Diversification; Investment Efficiency; Agency Costs*

Introduction

Corporate diversification is a form of a business strategy used by many managers to improve their company performance (Mehdi & Sabuii, 2011). In other words, corporate diversification is about preparing the company to enter new business activities, such as new markets or manufacturing new products (Marvian, 2015). According to Denis et al. (2002), corporate diversification shows a situation where agency problems decreased among managers and stockholders, so companies are seeking a type of strategy for creating an alignment between managers' and stockholders' interests. Corporate diversification has its own benefits and costs. Benefits of diversification include the creation of internal investment markets, debt capacity, and expansion of economic activities ranges. Diversification costs are mainly caused by agency costs. Managers may be motivated for diversification in order to support human capital, increase vested interests, or secure their position (Farooghi et al., 2014).

According to the theory of agency conflicts, managers' ability to alter or hide the information depends on the level of organizational complexity. Normally, companies with highly complex settings

and increased agency problems will own higher corporate diversification. Many studies have reported that companies with diversification strategies have a complex organizational structure and less operational transparency (Fang & Mishera, 2016). In addition, Fang & Mishera (2016) believed that corporate diversification will lead to an increase in agency conflicts and information asymmetry. Managers of these companies may tend to diversify their business in order to decrease the risk and also increase vested interests. As a result, managers are more inclined to not do optimal investment due to managerial incentives (Kutari et al., 2009).

The researches that are conducted in relation to investment include two sets of hypotheses, explaining that why some companies may deviate from the optimal level of investment. One of these hypotheses is the existence of information asymmetry between managers and investors (Mayerz & Majluf, 1984; Fazay et al., 1988).

Gayoo & Yoo (2018) reviewed the experimental literature associated with investment efficiency measurement in the fields of accounting and finance. They used 52 articles written about the subject of “investment efficiency” and identify theories, which were the foundation of this measurement, and then organized the indexes of investment efficiency into three categories. These categories included: neoclassic theories, agent theory, and real options theory. Moreover, the advantages and disadvantages of each measurement type were discussed and this helped researchers compare the best measurement for research purposes.

Naim & Li (2019) investigated the influence of financial development on investment efficiency under financial constraints and the subject matter of agency. The results show that financial development affects corporate investment positively. Also, an increase in financial development increases the investment efficiency by 42% for the low investing companies but decreases the investment efficiency by 90% for the high investing companies. Ultimately, if economic growth is taken into account, financial development will have a higher influence on the improvement of investment efficiency in low investing companies and high investing companies in countries with the high gross domestic product (GDP).

Hei, Chen, and Hou (2020) investigated the managers’ overconfidence in the selection of internal financing and investment efficiency. Results illustrate that internal investment can create business opportunities and compensate for investment deficiency but it can also lead to overinvestment, especially in companies with overconfident managers. Also, the overinvestment problem can be related to managers’ overconfidence in government-owned companies.

Sadeghi & Jamali (2017) investigated the effect of agency costs on over-investment. The results of testing this hypothesis showed that there is a significant and positive relationship between free cash flow and overinvestment. Also, according to the investigations in companies with high agency problems, the increased effect of free cash flow has been observed on overinvestment. Based on the findings, they argue that high information asymmetry between stockholders and investors has resulted in the theory of free cash flow and at the same time, an increase in the cash flow can lead to the investment by managers in projects with negative net present value (NPV). This can intensify the agent problems and overinvestment.

Aghayee & Hasanzade (2018) investigated accounting comparability and its influence on investment efficiency in 166 companies that were selected from the period between 2008 and 2015. The research observation shows that there is a significant and positive relationship between accounting comparability and investment efficiency. In other words, accounting comparability increases the level of access the quality accounting data concerning investment projects and, hence, improves investment decisions. As a result, when the accounting comparability of peer companies’ increases, there will be a ground created, upon which better decisions can be made by learning how the peer companies are investing.

Rahmani Norouzabad & Mohammadi (2019) identified the consequences of financial literacy on investment decisions and investment performance in the Tehran Stock Exchange. They utilized a standardized questionnaire for data collection. The population was composed of 344 investors that were selected and investigated by simple random sampling and were analyzed using the Cochran formula. The obtained results show that financial literacy and behaviors have a significant and positive effect on investors' decisions. Also, investors' decisions have a significant and positive effect on investment performance.

Managers are aware of optimal investment opportunities while investors are not completely aware. Hence, companies may suffer from overinvestment and not finance the projects with a positive NPV. Another hypothesis is associated with management's authorities seeking vested interests that lead to overinvestment (Grabuski & Muler, 1972). Each of these hypotheses predicts that investment is a function of internal cash flows. According to the theory of information asymmetry, companies with optimal investment opportunities and high cash flows will finance investment projects without any need for external investment markets. According to the managerial discretion hypothesis, managers prefer internal funds over external funds in order to finance inefficient projects (Mooler & Piev, 2007).

Montgomery (1994) introduced three theoretical views concerning why companies choose diversification strategies. These three views are as follows: agency theory, resource-based view, market power view. According to agency theory, diversification is the result of seeking managers' vested interests and managers may seek diversification due to several reasons such as increasing service recovery, power and credit, securing their position, and decreasing the risk. According to the resource-based view, companies with excess capacity will be more inclined toward diversification. According to this view, corporate diversification is an efficient form of organizing economic activities. According to the market power view, three anti-competitive motivations exist for diversification that includes taking advantage of generated earnings in an industry in order to support monopolistic valuation, collusion with other companies that are simultaneously competing in various markets, and utilizing corporate diversification in order to interact with larger companies to leverage smaller companies (Jiraporn et al., 2008).

Mehdi & Sabuii (2011) believe that corporate diversification eliminates the wealth of stockholders and "Company shares to be sold at a fraction". They explain that negative information is concealed more and more in companies that are executing geographical and industrial diversification. Denis et al. (2003) point out that managers are able to increase the size of the company through diversification, decrease the risk associated with low stockholders equity, and develop programs to increase vested interests.

It is argued that managers may diversify business activities due to several reasons, such as increasing service recovery, power, and credit (Jensen & Morphy, 1990), securing their position within the company by doing certain investments (Shifler & Vishni, 1990), and decreasing the risk of personal investments by decreasing company risk (Amihod & Lou, 1981). In this vein, Jensen & Mack Ling (1976) believe that corporate diversification is a necessary factor to deal with agency problems. Based on the above content, this question remains that:

"Does corporate diversification influence investment efficiency under agency costs conditions in the companies that are listed on Tehran Stock Exchange?"

Research Conceptual Model

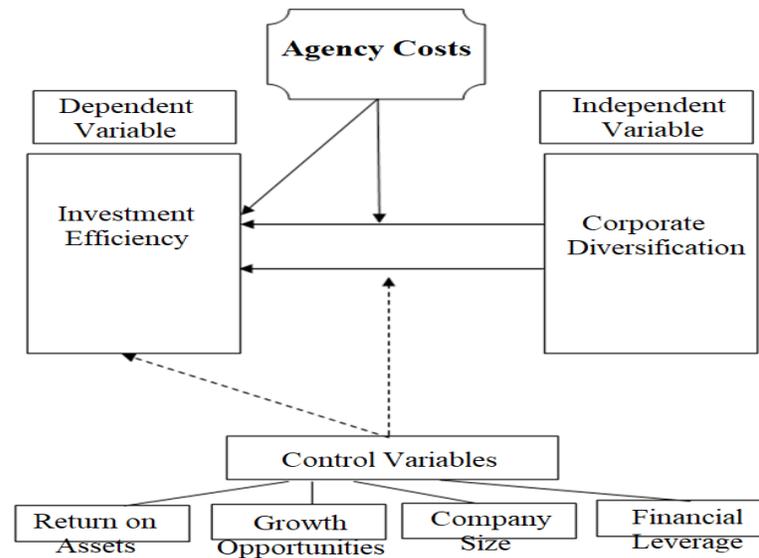


Figure 1 - Conceptual Model of Research Variables

Methodology

This study is considered a correlation and after-the-fact research, meaning that the research is conducted based on the previous data. The population is composed of all companies that are listed on Tehran Stock Exchange during 2004 and 2009. Due to extensive statistical population and related problems, and the existence of inconsistent data obtained from the population member that is required by the research, the conditions for selecting the sample are illustrated in Table (1).

Table 1- The process of selecting data from sample companies

No	Constraints	The total number of companies until March 2020 (End of 1398 Shamsi Hijri calendar)
1	Investment companies, insurance companies, banks, financial intermediaries, and financing institutions are not considered since the pattern of their accruals and cash flows are different from other companies.	(59)
2	Companies that changed their fiscal year during the period under study (2004-2009).	(66)
3	Companies that their fiscal year ends in March (final day of Esfand, Shamsi Hijri calendar) for comparability.	(116)
4	Companies that were listed on Stock Exchange before 2004 and were not removed from the list until 2009.	(126)
5	Companies that their data is not available.	(83)
	The total number of companies under investigation.	(110)

According to Table (1), the number of sample companies is 110 in this study and the number of observations is 600 years-company.

Documentary and library research methods were utilized in order to gather data and information. In other words, the needed information to write the literature review and theoretical foundations were gathered by going through books, foreign and domestic journals. Moreover, needed statistical data were extracted from financial reports of companies listed on the Tehran Stock Exchange and Rahavard Novin software. These financial reports can be observed by visiting the Tehran Stock Exchange website.

The model that was used to test the research hypotheses include:

Hypothesis Test Model (1): Corporate diversification affects investment efficiency.

$$\text{INVEFF}_{it} = \beta_0 + \beta_1 \text{DS}_{it} + \beta_2 \text{ROA}_{it} + \beta_3 \text{SIZE}_{it} + \beta_4 \text{MBV}_{it} + \beta_5 \text{LEV}_{it} + e_{it}$$

where INVEFF is investment efficiency, DS is corporate diversification, ROA is the return on assets, SIZE is firm size, MBV is growth opportunities, and LEV is financial leverage.

Hypothesis Test Model (2): Agency costs affect the relationship between corporate diversification and investment efficiency.

$$\text{INVEFF}_{it} = \beta_0 + \beta_1 \text{DS}_{i,t} + \beta_2 \text{AC}_{i,t} + \beta_3 \text{DS} * \text{AC}_{it} + \beta_3 \text{ROA}_{it} + \beta_4 \text{SIZE}_{i,t} + \beta_5 \text{MBV}_{i,t} + \beta_6 \text{LEV}_{i,t} + e_{i,t}$$

AC is the agency costs.

Indexes of descriptive statistics, including mean value, standard deviation, median, maximum, and minimum, are utilized for data analysis. Also, Kolmogorov–Smirnov test is used in order to normalize the data. A mixed data approach is used to test the research hypothesis.

Moreover, statistical program “Eviews”, panel data analysis method, fixed model effect, mixed model effect, and random model effect are employed in order to test the research hypothesis and are utilized.

Results

Normality test

Table 2 – Normality test of research variables

Variables	Symbol	Kolmogorov–Smirnov statistic	Probability value
Investment efficiency	INEFFI	0.094	0.000
Corporate diversification	DS	0.074	0.000
Firm size	SIZE	0.092	0.000
Financial leverage	LEV	0.400	0.000
Return on assets	ROA	0.086	0.000
Growth opportunities	MBV	0.089	0.000

Since the dependent variable “investment efficiency” is used in the research hypothesis test, we will normalize it after using Johnson transformation.

In Figure (2), a histogram of these variables prior to normalization and after normalization is illustrated. It should be noted that the diagram on the left side and right side illustrate pre normalization and post normalization, respectively.

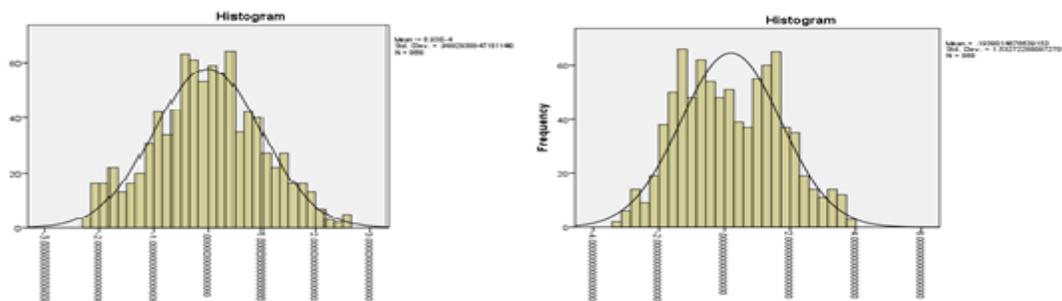


Figure 2 - Histogram of dependent variable “investment efficiency” for two situations: prior to normalization and after normalization

As can be seen in Figure (2), the distribution of this variable has been normalized after applying the Johnson transformation. Again, Kolmogorov–Smirnov test was utilized in order to observe the result of Johnson transformation for the normalization of this variable following Table (3).

Table 3 – Normality test of variable “political relations” after Johnson transformation

<i>Variables</i>	<i>Symbol</i>	<i>Kolmogorov–Smirnov statistic</i>	<i>Probability value</i>
Investment efficiency	INEFFI	0.020	0.200

The Results of First Sub-Hypothesis Test

To test the first main hypothesis of the research, model (1) is estimated using a panel data approach with fixed effects:

Model (1):

$$INEFFI_{i,t} = \beta_0 + \beta_1 DS_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 MBV_{i,t} + \beta_5 ROA_{i,t} + \varepsilon_{i,t}$$

The result of model (1) estimation for the main hypothesis can be observed in Table (4) and it shows that corporate diversification affects investment efficiency. The impact of corporate diversification on investment efficiency is negative (-0.155) and significant (0.015). The adjusted coefficient of determination also shows that independent variables of the main model (1) account for 26.5% of changes in the dependent variable. The value of the Durbin–Watson statistic (2.110) shows that there is no correlation between errors (remaining of the model), meaning that regression can be utilized. According to the multicollinearity test among disruption components, the VIF statistic was less than 10 for all variables and this shows the non-existence of multicollinearity among model (1) disruption components. The overall significance of the F-test shows that the whole model is significant.

Table 4 – Testing the research first hypothesis

<i>Dependent variable: Investment Efficiency</i>					
Variable	Coefficients	Standard Error	T-statistic	Level of significance	VIF statistic
Y-intercept	1.103	0.787	1.400	0.161	
DS	-0.155	0.064	-2.424	0.015	1.67
LEV	-0.576	0.089	-6.447	0.000	1.21
SIZE	0.161	0.045	3.546	0.000	1.27
MBV	0.071	0.045	1.565	0.118	1.28
ROA	0.380	0.217	1.749	0.080	1.31
F statistic	3.310	Coefficient of determination		0.380	
Significance	0.000	The adjusted coefficient of determination		0.265	
Durbin–Watson statistic	2.110	Mean VIF		1.62	
Significant in 5% error level					

Related to control variables, financial leverage has a negative and significant relationship with investment efficiency. Also, there is a significant and positive relationship (0.161) between firm size and investment efficiency. On the other hand, there is no significant relationship between return on assets and growth opportunities with investment efficiency.

The Results of Second Hypothesis Test

To test the first main hypothesis of the research, model (2) is estimated using a panel data approach with fixed effects:

Model (2):

$$\text{INEFFI}_{i,t} = \beta_0 + \beta_1 \text{DS}_{i,t} + \beta_2 \text{AC}_{i,t} + \beta_3 \text{DS} * \text{AC}_{i,t} + \beta_4 \text{SIZE}_{i,t} + \beta_5 \text{LEV}_{i,t} + \beta_6 \text{MBV}_{i,t} + \beta_7 \text{ROA}_{i,t} + \varepsilon_{i,t}$$

The result of model (2) estimation for the second hypothesis can be observed in Table (4) and it shows that the impact of agency costs on the relationship between corporate diversification and investment efficiency is negative (-0.249) and significant (0.004). Hence, the second hypothesis of the research is approved.

According to the adjusted coefficient of determination, independent variables of model (2) account for 23.6% of changes in the dependent variable. The value of the Durbin–Watson statistic (2.118) shows that there is no correlation between errors (remaining of the model), meaning that regression can be utilized. According to multicollinearity test among disruption components, VIF statistic was less than 10 for all variables and this shows the non-existence of multicollinearity among model (2) disruption components. The overall significance of the F-test shows that the whole model is significant.

Table 5 – Testing the research second hypothesis

<i>Dependent variable: Investment Efficiency</i>					
Variables	Coefficients	Standard Error	T-statistic	Level of significance	VIF statistic
Y-intercept	2.113	0.756	2.791	0.005	
DS	-0.203	0.063	-3.211	0.001	1.34
LEV	0.318	0.138	2.298	0.021	1.56
DS * AC	-0.249	0.087	-2.842	0.004	1.51
LEV	-0.605	0.090	-6.693	0.000	1.24
SIZE	0.124	0.045	2.730	0.006	1.57
MBV	0.073	0.046	1.594	0.111	1.53
ROA	0.060	0.202	0.298	0.765	1.53
F statistic	3.047	Coefficient of determination		0.355	
Significance	0.000	Adjusted coefficient of determination		0.238	
Durbin–Watson statistic	2.118	Mean VIF		1.83	
Significant in 5% error level					

Related to control variables, financial leverage has a negative and significant relationship (-0.605) with investment efficiency. Also, there is a significantly positive relationship (0.124) between firm size and investment efficiency. On the other hand, there is no significant relationship between return on assets and growth opportunities with investment efficiency.

Discussion

The results show that investment efficiency has a negative and significant impact on corporate diversification. In other words, an increase in investment efficiency will reduce the conflict of interest between stockholders and managers and will influence corporate diversification. In fact, an increase in investment efficiency will lead to a decline in corporate diversification. Theoretically, if the final benefits of investment in projects with a positive net current value are equal to its final costs, the companies will continuously invest in these projects.

Previous researches show that factors such as information asymmetry and agency problems within semi-complete markets may force the managers to make inefficient investment decisions that will result in the growth of over-investment and under-investment. Hence, if the investment is financed by the stockholders, managers may ignore low-risk projects with a positive current value. The reason for such investments is that stockholders will be liable for investment costs but security holders will benefit from these investments. Therefore, managers of the company may be inclined toward low-risk projects that can benefit the stockholders more. On the other hand, over-investment is caused by a lack of alignment between managers' and stockholders' interests. In the presence of free cash flows, company managers have a tendency to expand their company and choose the projects with negative current net value, which will reduce the value of stockholders, in order to realize their goals. According to the hypothesis of agency conflicts, managers' ability to alter or conceal the information depends on the level of organizational complexity. Normally, companies with highly complex settings and increased agency problems will own higher corporate diversification compared to other companies. Many studies have reported that companies with diversification strategies have a complex organizational structure and less operational transparency. In addition, Fang & Mishera (2016) believed that corporate diversification will lead to an increase in agency conflicts and information asymmetry. Managers of these companies may tend to diversify their business in order to decrease the risk and also increase vested interests. The findings are in agreement with the findings of Jiraporn et al. (2008), Mehdi & Sabuii (2011), Farooghi et al. (2004), Fang & Mishera (2016), Son et al. (2017), and Bacher et al. (2017).

The results showed that agency costs affect the relationship between investment efficiency and corporate diversity. In fact, investment efficiency plays a more effective role in reducing company diversification within companies with higher agency costs. In fact, investment efficiency acts as a regulatory mechanism and it has more potential to find and confine corporate diversification in companies with high agency costs. According to agency theory, managers will have excellent information concerning company investment opportunities. Nevertheless, managers will seek to maximize their vested interests, instead of maximizing the stockholders' value if the motives of managers and stockholders are not aligned. This approach can lead to deviation from company investments, for example rejecting optimal projects or investing in non-optimal projects. Morphy (1985) believes that growing firm size can increase managers' power by increasing the resources under their control and number of sales. Therefore, when the stockholders do not have enough information to observe managers' behavior, managers will be motivated to grow the company to an optimal size. Jensen (1986) believes that paying cash to the stockholders can resolve the conflict of interest between managers and stockholders. Firstly, paying the stockholders reduces the resources under the control of management and therefore, managers' power decreases. Secondly, paying cash will lead to more control over the investment market when companies are looking for new investments. These conflicts increase in companies with free cash flows. In case the free cash flows increase, managers may tend to invest lower than the rate of investment costs or waste cash for company inefficiencies in order to prevent paying cash. This approach leads to over-investment. Jensen (1986) believes that debt can reduce the managers' tendency for over-investment and therefore, the cost of operating cash flows decreases. In other words, there is a negative relationship between financial leverage and over-investment. In addition, Mayers (1977) points out that under-investment can be caused by agency conflicts between security holders and stockholders, which can be reduced by decreasing debt in the company balance sheet. Therefore, these studies show that there is a positive relationship between higher financial leverage and underinvestment. The findings are in agreement with the findings of Jiraporn et al. (2008), Mehdi & Sabuii (2011), Farooghi et al. (2004), Fang & Mishera (2016), Son et al. (2017), and Bacher et al. (2017).

Conclusion

Previous literature shows that the information asymmetry between managers and stockholders affects the company investment decisions significantly and this intensifies the agency problems. These

problems are mostly observed in developing markets such as Iran compared to developed markets. One of the crucial roles of financial markets is to allocate resources from different economic factors to companies that can perfectly make use of these resources. As a result, the possibility of effective investments is provided for the companies. Nevertheless, information problems and individuals' motives in financial markets are caused by agent costs. Therefore, the objective of this research is to investigate the influence of corporate diversification on investment efficiency with an emphasis on agency costs, for the companies that are listed on Tehran Stock Exchange. Hence, 110 companies were selected for the period between 2014 and 2019. Two hypotheses are proposed in this research. The results of the first hypothesis show that corporate diversification has a negative and significant impact on efficiency, meaning that an increase in investment efficiency reduces the conflict of interest between stockholders and managers and affects corporate diversification. Also, the results of the second hypothesis show that agency costs affect the relationship between investment efficiency and corporate diversification. In fact, investment efficiency plays a more effective role in reducing corporate diversification in companies with higher agency costs. In fact, investment efficiency acts as a regulatory mechanism. The findings are in agreement with the findings of Jiraporn et al. (2008), Mehdi & Sabuii (2011), Farooghi et al. (2004), Fang & Mishera (2016), Son et al. (2017), and Bacher et al. (2017).

Limitations

In general, scientific researchers are needed to be questioned in a reasonable and regular manner. The researchers need to criticize their own research results and be the toughest critics of their own research. In other words, the world we are given to study is not 100% true or false. Nothing can be absolutely confirmed in natural science, and basically, the theory is neither vindicable nor refutable nor non-probable. The current article is not an exception and it encounters some limitations, according to which the results should be explained carefully. Limitations and problems in the execution of the current research should be taken into account in order to interpret the research findings and generalize them. These problems and limitations are explained as follows:

- 1- The model proposed by Chen et al. (2011) has been utilized in this research in order to measure investment efficiency. If other models are utilized, different results can be obtained from the research.
- 2- Considering that the measurement of investment efficiency is in the form of year-industry, at least 10 companies were needed to be present in the industry in order to measure investment efficiency. Due to this limitation, the number of research samples decreased.
- 3- In this research, the effect of four variables (firm size, financial leverage, return on assets, and growth opportunities) has been controlled. However, many uncontrollable and controllable valuables, which can affect the relationship between variables in this research, are ignored.

Suggestions

- 1- The findings showed that investment efficiency leads to a decline in corporate diversification. Therefore, it is suggested that management should take advantage of applicable strategies in order to control corporate diversification processes and should focus exclusively on the regulatory mechanism of investment efficiency since not only does investment efficiency helps increase the value but also reduces the information asymmetry.
- 2- It is also suggested that agency costs are the factor intensifying corporate diversification and therefore, it is just that investors should take advantage of applicable strategies in order to control agency costs and reduce information asymmetry in the company.

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