

## **The Relationship between Diversification Strategy, Capital Structure and Profitability in Companies Listed in the Stock Exchange by Combining the Data Line and VAR Methods**

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**Abstract.** The present study investigates the relationship between diversification strategy, capital structure and profitability in companies listed in the stock exchange through a combination of data panel and VAR methods. The present research was conducted for companies admitted to the Tehran Stock Exchange from 1387 to 1395 and 78 companies were selected as case study. Stationary and static tests were used to check the rationality of the behavior of variables. After assuring the rational behavior of variables over time and carrying out the correlation test, Chow (Flemmer) and Hausman tests were performed to determine the probability of collinearity in the regression model, and finally these tests were examined in the regression model using panel data with fixed effects. To ensure that the data panel model is evaluated, the residual was normalized and waste graph survey was performed. The research findings showed that the diversification strategy, capital structure and profitability in the companies accepted in the

stock exchange has have a significant relationship. Also, the results of this study showed that diversification strategy has a significant effect on profitability.

**Keywords:** Diversification Strategy, Capital Structure, Profitability.

## 1. Introduction

One of the most important issues for financial economists is to identify the relationship between profitability and corporate financing decisions or capital structure. The optimal capital structure is to maximize the value of the company and minimize the cost of capital. Achieving an optimal capital structure for maximizing profitability has always been a challenging topic for financiers (Sadeghi Shahdani, 2012). Achieving the optimal capital structure to maximize profitability, value and minimum cost of capital are among the important issues studied by financial professionals. In the area of the relationship between financial decision making and profitability of companies, there are mainly four theories mentioned including Miller and Modiglian, theory, agency theory, static equilibrium theory and hierarchical theory. Financial-economic researchers have found that the structure of capital and profitability depend on each other, but their relationship is not the same in terms of financial operations of corporations in the international context, and is dependent on financial structures and economic conditions of a country. Thus, the researchers analyze the relationship between the capital and profitability structure in different countries, which of course, have different results in this regard. Capital structure is considered as the most important parameter affecting the valuation of companies and for their orientation in capital markets. (Douglas, 2001). Companies are in need of capital for growth and development. A portion of the company's capital is provided through profit accumulated as a result of the company's profitability not split among shareholders, and the remainder can be created through capital markets or borrowing. A company that has no debt, its capital structure is the property of the capital owners, and since the capital structure of most companies is associated with debt and capital, henceforth, the financial directors are accurate and sensitive in loaning, its effects and maximizing the shareholder wealth. Since

investors finance on a particular stock based on different criteria, while comparing different types of stocks, the stock price of companies is one of the most prominent investment criteria, which is in fact the company's credibility for investment. Therefore, comparing the company's credit is one of the methods for improving investment by identifying the factors affecting stock prices of companies, which investors predict the trend of price changes and changes in company value, and based on that, make decisions on the purchase or denial of stocks (Pourheidari, Omid, 1374). Use of financial engineering to evaluate and apply financial instruments, use optimal resources allocation strategy in the short and long term, execute tasks and to manage and mobilize the resources and facilities available in accordance with strategic goals and to analyze investment decisions through capital budgeting, application of international financial management in the global arena due to the globalization of economy, attention to the mechanism of creating a portfolio in stocks and investment, and the use of auxiliary methods in various types of financial decisions, etc., are among the goals and objectives of financial management. For investors, financial status is considered as the only factor or criterion determining the competitive position of an organization. In order to formulate strategies in an effective manner, it should be financially determined by the weaknesses and strengths of the organization. The liquidity power, amount of loans, working capital, profitability, and optimal use of assets, cash flows and equity rights can be such that some strategies become inactive and cannot be considered as an option. Most financial factors change existing strategies and executive programs. Considering the importance of establishing a proper strategy for companies in order to achieve the company goals, the most important of which is creating value for the creditors, in Stock Exchange by combining the data panel and VAR methods.

## **2. Literature review**

Assadi et al. (1395) investigated the relationship between capital structure and profitability in companies listed in Tehran Stock Exchange. The research results in all hypotheses indicate that there is a meaningful positive correlation between capital structure and

profitability. In other words, the capital structure affects the profitability of companies admitted to Tehran Stock Exchange. Therefore, in the event that companies are profitable, the use of financial leverage is in favor of companies admitted to the Tehran Stock Exchange, but in the absence of profitability, the use of high debt is not recommended. Ghafourian Shagerdi (1395) investigated the relationship between capital structure and profitability of the paper and printing industry companies accepted in the stock exchange. This research is a quasi-empirical research that is targeted to practical applications. The results of this study showed that there is a significant relationship between capital structure and profitability components in companies active in the paper and publishing industry in Tehran Stock Exchange. Baghumian et al. (2014) correlated the characteristics of the company and the capital structure. For this purpose, data from 157 companies at the 2004 - 2010 period were considered for the purpose of testing the research hypotheses using the statistical method of "compilation of data". The results of the research show that there is a direct and significant relationship between size, tangible assets and risk factors of the company with the capital structure, and growth opportunities of the company have an inverse relation. In addition, in the present study, no significant relationship was found between life and industry with capital structure. Aghaei (1393) investigated the relationship between product diversification and performance of companies listed in Tehran Stock Exchange. To measure the company's performance, we use the Tobin's Q index and the entropy criterion to measure variability. Also, in order to test the research hypothesis, we reviewed 107 companies listed in Tehran Stock Exchange from 2007 to 2012. The results of the research showed that the entropy of product diversification has a negative and significant effect on the performance of the companies. Gerd et al. (1393) investigated the relationship between the financial leverage (capital structure) criteria and performance measurement criteria. In this research, 71 companies (355 years company) were selected to test the research hypotheses between 2008 and 2012. In this research, data analysis was performed using multivariate regression and correlation coefficient. The K-S test was used to determine the normality of the data, the regression method to express the relationship between the

variables, the samples t-test to test the significance of the regression equation coefficients and finally the Fisher's exact test to determine the significance of the equation. There is a meaningful relationship between variables of total debt to total equity ratio, total long-term debt to total assets ratio and total debt to total capital with the criterion for assessing the return on assets, but none of the independent variables are significantly related to Tobin's Q variable. Sadeghi Shahdani et al. (2012) modeled the relationship between profitability and capital structure in Tehran Stock Exchange using the generalized method of moments. In order to test the hypotheses, relationships between capital structure (financial leverage) and profitability are first fitted using mixed regression. Then, mixed regression is used to obtain more efficient estimates. So after applying Chave and Hausman tests, we choose the mixed model of fixed effects regression. The linear results of the research indicate that the relationship between capital structure and profitability is negative, and this can be due to the complex relationships existing in the market and the debt financing problems (in terms of the rate of facilities received and the returns of executive plans) in companies. The results of this study show the confirmation of hierarchical theory for the relationship between profitability and capital structure in companies admitted to the Tehran Stock Exchange, in which profitable companies turn to less borrowing and prefer to finance in domestic sources. Finally, in order to solve the endogenous problem between the variables and optimal estimation, we use the generalized method of moments. The results show a non-linear relationship (U-shape) between profitability and capital structure. This is important in expressing the combined interpretation of theories of profitability and capital structure at three levels of low profitability with growth opportunities, average profitability, and high profitability. Arbabian et al. (2009) investigated the effect of capital structure on the profitability of companies listed in Tehran Stock Exchange. The results of the research indicate that there is a positive relationship between the ratio of short-term debt to assets and profitability of the company as well as the ratio of total debt to asset and profitability. But there is a negative relationship between the long-term debt to asset and profitability ratio. Mehrani et al (2007) examined the relationship between profitability ratios and capital

structure in Tehran Stock Exchange. The capital structure of companies plays a decisive role in investment decisions. The purpose of this research is to examine the relationship between capital structure as a dependent variable and various profitability ratios of companies as an independent variable. Therefore, 189 companies were surveyed during the 9-year period (1375-1383). Companies from four industries including cement, lime and plaster, pharmaceutical industry, food and beverage industry, and the machinery and equipment industry, with a larger number of companies, were also selected to provide statistical tests on their companies. Then, the financial leverage as a dependent variable and profitability ratios including operating profit to sales, gross margin to sales, return on assets, return on equity, net profit to sale, profit before tax to sale, profit before tax to gross profit and profit after tax to gross profit, were introduced into the model as independent variables. In order to test the hypotheses, simple regression analysis was used. The regression method used in the research is a mixed regression method using panel data. The significance test of patterns was carried out using T and F statistics. Namazi et al. (2005) investigated the relationship between capital structure and profitability of companies listed in Tehran Stock Exchange (with emphasis on industry type). In line with this goal, all companies listed on the Tehran Stock Exchange, which presented financial statements (balance sheet, profit and loss account) and required information in the years 1996-2000, were investigated. A total of 108 companies were selected from various industries. Then, information about the average ratio of liabilities to assets and equity during the five-year period of the study was collected annually and locally. Subsequently, information about the average ratio of liabilities to assets and return on investment (ROI) was collected and tested annually for the same 5-year period. In order to test the hypotheses, simple regression and correlation coefficient were used and their significance was determined using t and Z statistics. The results indicate that: Generally speaking, there is a positive relationship between capital structure and profitability of the company, but this relationship is statistically weak; the relationship between capital structure and profitability depends on the industry, and the optimum capital structure can be determined in different industries, and the relationship between capital structure and

profitability in different industries also depends on the definition of profitability. Joudia (2017) investigated the relationship between diversity, capital structure and profitability using the combination of panel and VAR approach. There is a two-way reverse causal relationship between profitability with leverage and diversity. The stability situation for the relationship between variability and leverage is not verified, but is observed for three factors simultaneously. Analysis of variance of error confirms the prediction of diversity selection as the most intrusive variable. Positive response functions represent significant dynamic relations in the financial sector. ELbekpashy (2018) examined the impact of the company's characteristics on the capital structure. This study examines the importance of relations between the economic sector as a control variable and three leverage ratios. Multiple regression analysis is used to create explanatory models for two small and medium enterprises. The first sample includes 28 small and medium-sized companies admitted to the stock market until 31.12.2016, covering the period from 2008 to 2015. The second sample consists of 95 small and medium sized companies that are not listed on the stock exchange. The general model suggests that all independent and control variables substantially justify the capital structure decisions of small and medium-sized Egyptian companies. The results of these two examples are very similar. Management ownership is negatively correlated with short-term financial leverage, while major ownership has a positive correlation with total leverage and short-term leverage. In addition, this section shows a significant relationship with capital structure. The results of this study show that the best explanation for the behavior of small and medium-sized Egyptian companies is the hierarchical theory. At the end of this study, useful recommendations are provided for policy makers and the management of small and medium-sized Egyptian companies. Sun (2016) examined the relationship between ownership, capital structure, and financing decision making. Institutional ownership has a positive homogeneous effect on company leverage ratios, while the high degree of institutional ownership reduces the probability of issuing bonds over stocks. Our results provide two justifications and reasons: Firstly, firms with high institutional OC have a stimulus to issue more bonds and lower stocks. Secondly, these companies have a tendency to switch to

other types of debt, such as financing channels. Petacchi (2015) investigated the information and capital structure asymmetry. This finding is difficult for alternative proxies for asymmetry of external information and cannot be explained by changes in debt costs or changes in general macro terms. Given the fact that the cost of capital is increasing at the asymmetry level of external information, my results are consistent with the view that managers maintain the target leverage ratios to be more dependent on debt when added to the cost of the stock related to the information environment of the company. This paper provides empirical evidence on the impact of information risk on corporate financial choices. Nirajini et al. (2013) investigated the impact of capital structure on financial performance Sri Lanka's commercial companies. There is a link between capital structure and financial performance, and the capital structure dramatically affects corporate financial performance. Therefore, all companies need to carefully consider their construction decisions in order to profit and manage their business successfully. In 1984, Bradley and his colleagues conducted a research on the theoretical evidence of the existence of optimal point of capital structure and examined the factors of industry type and business risk for 851 companies in the fields of electricity, gas and air transport, and obtained the following results. First, the type of industry is effectively influenced by the debt of companies, so that the virtual variables related to the type of industry define 54% of the leverage changes. Business risk has also been considered as an important factor in determining the amount of debt utilization in the capital structure of the companies studied. They also pointed out that leverage ratios are inversely related to the volatility of corporate earnings. Myers and Majlof (1984) examined the determinants of capital structure from the point of view of information asymmetry hypothesis. In this study, which coincided with Myers' independent research in the same year, it has been claimed that if there is information asymmetry between the company and the market capitalization, profitable companies would prefer domestic sources of finance than foreign sources. And if they need more resources, they first start borrowing and eventually distribution of shares. Myers, in his 1984 study, described the concept of capital structure as a hierarchy of financing options. The major predictions of this theory are that



profitable companies are borrowing less and, consequently, their ratio of debt to capital is low. Given the above background, the assumptions of the present research were considered as follows: Main hypothesis: diversification strategy, capital structure, and profitability in companies listed on the stock exchange have a meaningful relationship. Sub-hypothesis: The diversification strategy has a significant impact on profitability. Capital structure has a significant impact on profitability.

### 3. Method

This applied research is based on library and field methods in case of the degree of supervision and control and is used in two batches of information. The first batch of information used to set the theoretical foundations of the research is gathered by the library method, and the second batch of information is used for statistical analysis, regression equations and hypothesis testing, which is collected by the field method using a questionnaire. According to the causal method, it is a correlation study.

The research model will be as follows:

$$Y_{it} = Y_{it-1}A_1 + Y_{it-2}A_2 + \dots + Y_{it-p+1}A_{p-1} + Y_{it-p}A_p + X_{it}B + u_i + e_{it}$$

$$i \in \{1,2, \dots, 412\}, t \in \{2002, \dots, 2012\}$$

Y: Profit vector measured by Return on Asset

X: Environmental Activities and Geographic Variations (Entropy and Herfindahl-Hirschman Index)

Vector moving average equation:

$$\Phi_t = \begin{cases} I_k, & i = 0 \\ \sum_{j=1}^i \Phi_{t-j}A_j, & i = 1,2 \end{cases}$$

Varied Income:

$$DIV_i = 1 - \frac{(\text{Net interest income} - \text{other operating income})}{(\text{total operating income})}$$

Variable	Definition
ROA	Return on Assets
LEV	Financial leverage

DIV	Dividend Yield Indicator
DEI	Enteropathy index
DHI	Herfindahl-Hirschman Index

Information about the research variables including the information contained in the financial statements of the companies as well as the information exchanged in the Tehran Stock Exchange and other information have been extracted through various software and information systems of Tehran Stock Exchange. So that, the information resulted from the financial statements are collected through the “Rahavard-e-Novin” software, from the website “rdis.ir” and also the transaction information through the “irbourse.ir” website. The statistical population of this research includes all companies accepted in the Tehran Stock Exchange from the beginning of 2008 to the end of 2016 who have maintained their membership in the Tehran Stock Exchange during the period.

#### 4. Findings

The easiest way to determine the stationarity of a variable is to look at its graph. But since this method is not sufficiently precise, it is necessary to test the stationarity of time series variable, the unit root test is one of the most common tests used to determine the static nature of a time series process. For further explanation, consider the vector autoregressive process of the first order below:

$$Y_t = \varphi y_{t-1} + \varepsilon_t$$

If, in the above equation, the coefficient  $\varphi$  is tested using the ordinary least squares (OLS) method equal to one, it can examine the stationary and non-stationary nature of a time series process. Thus, if  $1 \leq |\varphi|$  Then Y is a non-stationary time series and its variance increases over time and reaches infinity. If  $|\varphi| < 1$ , then Y is a stationary time series (or difference-stationary). Therefore, the stationarity(difference-stationarity) of the given time series can be evaluated by testing of value  $\varphi$  strictly less than one. General test, zero hypothesis  $\varphi = 1$  H0: In contrast to the hypothesis H1:  $\varphi < 1$ .

The standard Dickey-Fuller test is performed by estimating the following equation after subtracting  $Y_{t-1}$  from the two sides of the equation:

$$Y_t - Y_{t-1} = (\varphi - 1)Y_{t-1} + \varepsilon_t$$

So:

$$\Delta Y_t = \delta Y_{t-1} + \varepsilon_t$$

Where  $\delta = \varphi - 1$ . In this case, the zero hypothesis and the opposite hypothesis for the time series reliability test are set as follows:

$$\begin{cases} H_0 = \delta = 0 \\ H_1 = \delta < 0 \end{cases}$$

The known statistic for testing the  $H_0$  hypothesis is the t-statistic calculated as follows:

$$t = \frac{\hat{\delta}}{\text{se}(\hat{\delta})}$$

Where  $\delta$  and  $\text{se}(\delta)$  are the standard deviation of the estimated coefficient. The main problem with this test is that the t-statistic presented by the ordinary least squares method, under the zero hypothesis of the existence of the root, lacks extreme normal distribution and does not have a standardized form. Dickey and Fuller (1979) showed that under the zero hypothesis the unit root of this statistic does not follow the normal distribution of t, so the critical quantity t cannot be used for the test. The practical solution given by Dickey and Fuller (1979) is the proposition of the  $\tau$  test instead of t test, which has a finite distribution. The critical values of  $\tau$  for tests and different sample volumes have been obtained and tabulated using the Dickey and Fuller simulation methods. If the absolute value of the calculated  $\tau$  statistic is larger than the absolute value of critical provided by Dickey and Fuller, then the stationarity of time series cannot be rejected, and the desired time series is stationary, but if the absolute value of the calculated  $\tau$  statistic is less than the provided critical value, then the zero hypothesis based on the unit root is accepted, in which case the desired time series has a random step process and is therefore non-stationary. Also for the time series stationarity test, Dickey and Fuller (1979) extracted the

extreme distribution of the  $\tau$  statistic based on the patterns which estimate the above equations, taking into account the y-intercept and trend, the y-intercept without trend, and without the y-intercept and trend. The ordinary Dickey-Fuller unit root test discussed above is only valid when the time series examined is an auto-regressive process of the first order. If this assumption does not exist and the time series is correlated in higher intervals, that is, the auto-regressive process of P-order, then the white noise assumption of the disrupted  $\tau$  statements is violated. When the error statements are correlated, the Dickey-Fuller test can no longer be used to test the stationarity. Because in this case, again, the extreme distribution and critical values obtained by Dickey and Fuller is still true. The Augmented Dickey-Fuller test (ADF) produces a parametric correction for higher order correlations, assuming that the time series X follows an AR (p) process, and adds the differential components with the interruption P from the dependent variable Y to the right side of the equation:

$$\Delta Y_t = \delta Y_{t-1} + \sum_{i=1}^p \beta \Delta Y_{t-1} + \varepsilon_t$$

This generalized statement is then used for the stationarity test. An important result obtained by Dickey and Fuller (1981) is that the partial distribution of stationarity test statistics depends on the number of first-order interruptions in the ADF regression. The number of interrupted differentiated components (number of optimum interruptions) to eliminate consecutive consistency in waste, is determined using the three criteria of the Akaic (AIC) Schwartz-Baizian (SBC) and Hanan Quinn (HQ), as well as the criteria with the adjusted values of these three criteria. The proposed test statistic by Philips and Peron (1998) is based on the extreme distribution of the various Dickey-Fuller statistics, with the difference that the assumption that the interrupting sentences  $\tau$  are distributed identically and independently is excluded. Phillips and Perron showed that the test statistic is for a time distribution of  $\tau$ s that are not identical and independent of each other, which contains the following terms:

$$\sigma_\varepsilon^2 = \lim_{n \rightarrow \infty} \frac{\sum_{t=1}^n E(\varepsilon_t^2)}{n}$$

$$\sigma_2 = \lim_{n \rightarrow \infty} \frac{\sum_{t=1}^n E(\varepsilon_t^2)}{n}$$

If the errors are distributed identically and independently, then  $\sigma_\varepsilon^2$  and  $2\sigma$  are equivalent, and the Phillips and Perron results are similar to those obtained by Dickey and Fuller. But they are usually not the same, and as a result, the tests performed using the  $\tau$  test statistic are not valid (Nofersti, 1999: 50). The results of the unit root test of the model variables have been reported based on the Phillips Perron test in Table 3-3. The results show that the model variables are valid based on the Phillips Perron test.

**Table 1.** The results of the Phillips Perron static test

Variable	The statistics	Meaningful	Result
Profitable	<b>-10.23</b>	<b>0.000</b>	static
Return on assets	<b>-7.04</b>	<b>0.000</b>	Static
Herfindal Harshman Index	<b>-8.92</b>	<b>0.000</b>	Static
Dividend Indicator	<b>-8.62</b>	<b>0.000</b>	Static
Entropy index	<b>-11.62</b>	<b>0.000</b>	Static

As it is seen in table 1 the significance level is less than 0.05 in all cases. Therefore, the stationarity of all examined variables is confirmed. Regarding the stationarity of all the variables studied, we can estimate the regression model. Before model estimation, the correlation diagram of model variables can be very suitable. Correlations represent the coherence of the model components, if Pearson correlation is more than 0.7 and meaningful, then there is a possibility of coherence in the model. The correlation between the variables studied by Pearson method is presented in the table 2.

**Table 2.** Correlation between model variables

Correlation Probability	X1	X10	X2	X3	X4	X5	X6	X7	X8	X9	Y
X1	1.000000 ----										
X10	0.128069 0.0055	1.000000 ----									
X2	0.736040 0.0000	0.051982 0.2612	1.000000 ----								
X3	0.685223 0.0000	0.035833 0.4388	0.985634 0.0000	1.000000 ----							
X4	0.013819 0.7653	-0.031919 0.4905	0.104967 0.0230	0.174453 0.0001	1.000000 ----						
X5	-0.038474 0.4058	-0.253001 0.0000	-0.017882 0.6993	-0.020624 0.6560	0.032424 0.4836	1.000000 ----					
X6	0.045233 0.3283	0.074607 0.1066	-0.022548 0.6262	-0.031031 0.5026	0.055383 0.2313	0.016646 0.7159	1.000000 ----				
X7	-0.094694 0.0404	-0.019439 0.6746	-0.067307 0.1456	-0.063294 0.1712	-0.039651 0.3916	-0.036829 0.4262	-0.619346 0.0000	1.000000 ----			
X8	0.070151 0.1293	0.786369 0.0000	0.002795 0.9519	-0.003626 0.9376	-0.047316 0.3065	-0.277830 0.0000	-0.191321 0.0000	0.173953 0.0002	1.000000 ----		
X9	0.074789 0.1057	0.843164 0.0000	0.012417 0.7885	0.004900 0.9157	-0.043112 0.3515	-0.278665 0.0000	-0.182239 0.0001	0.202111 0.0000	0.976247 0.0000	1.000000 ----	
Y	0.070936 0.1250	-0.051783 0.2631	-0.126425 0.0061	-0.121495 0.0084	-0.017757 0.7013	0.060211 0.1930	0.027021 0.5594	-0.031264 0.4994	-0.036058 0.4359	-0.044390 0.3374	1.000000 ----

In table 2 the correlation coefficient in the first line and the correlation significance are written in the second line. If significance is less than 0.05, the correlation is statistically significant. As it is seen, correlations are significant in some cases, but the intensity of correlations between independent variables is less than the probability that when there is a probability for collinearity in the model. The Chave test is used to determine whether the panel method is more efficient in estimating the model or the mixed data method.

**Table 3.** Chave test results

Result	Significance level	Degrees of freedom	Test statistic	Regression model
Use the data panel model	<b>0.000</b>	<b>(263,66)</b>	<b>3.78</b>	

As it is seen in table 3 the significance level of the Chave test is more than  $\alpha = 0.05$ , so with 95% confidence, it is possible to estimate the model using the panel method. Given the fact that the zero assumption of the Chave test for the equality of y-intercepts was rejected, the Hausman test is used to determine whether there exist any fixed effects or random effects.

**Table 4.** The results of the Hausman test

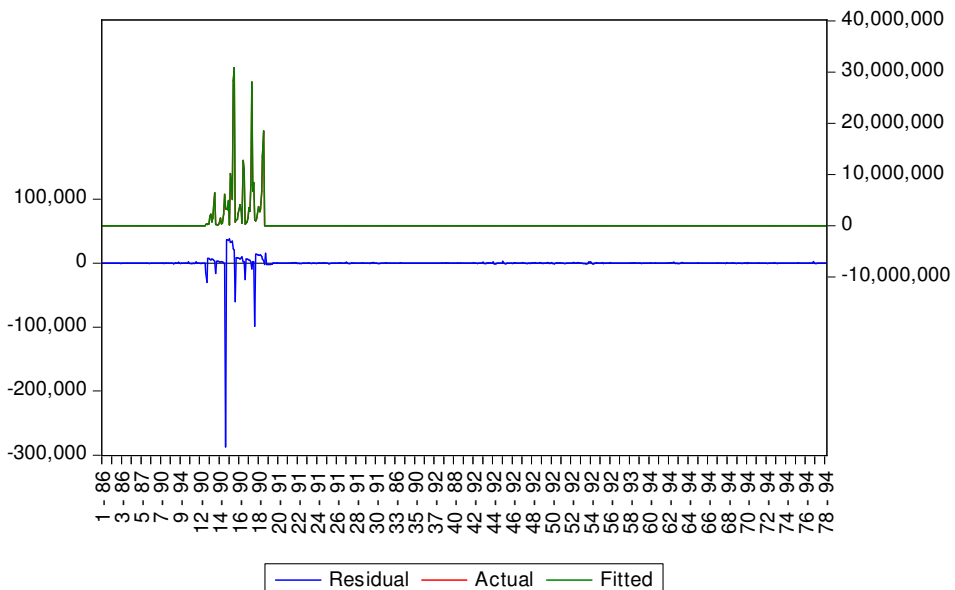
Result	Significance level	Degrees of freedom	Test statistic	Regression model
Fixed effects	<b>0.000</b>	<b>5</b>	<b>26.73</b>	

The results of model estimation by panel method using fixed effects (data panel) are presented in Table 5.

**Table 5.** Correlation results

Response Variable = Profitability			
Significance level	Test statistic T	Coefficients Regression	Independent variables
<b>0.000</b>	<b>-4.742111</b>	<b>-6138.287</b>	Fixed equation ( $\alpha$ )
<b>0.0548</b>	<b>1.92398</b>	<b>655.9565</b>	Return on assets
<b>0.8215</b>	<b>-0.225768</b>	<b>-124.3609</b>	Dividend Indicator
<b>0.6759</b>	<b>-0.418255</b>	<b>-236.5344</b>	Entropy index
<b>0.0001</b>	<b>3.957953</b>	<b>386.2039</b>	Size
<b>0.1765</b>	<b>1.353081</b>	<b>0.135345</b>	Market value to book value
<b>0.0007</b>	<b>3.399708</b>	<b>10.99718</b>	Diversity strategy
<b>0.365</b>	<b>-0.906576</b>	<b>-38.53441</b>	Financial Leverage
<b>0.000</b>	<b>1812.154</b>	<b>0.2001</b>	Capital Structure
Significance level = <b>0.000</b>		The test statistic is F = <b>5.393684</b>	
Ratio = 0.68		Watson Camera Statistics: 1.56	

In Fig. 1, the linear graph of the regression model residual is presented.



**Figure 1.** Linear Chart of Regression Model Residual

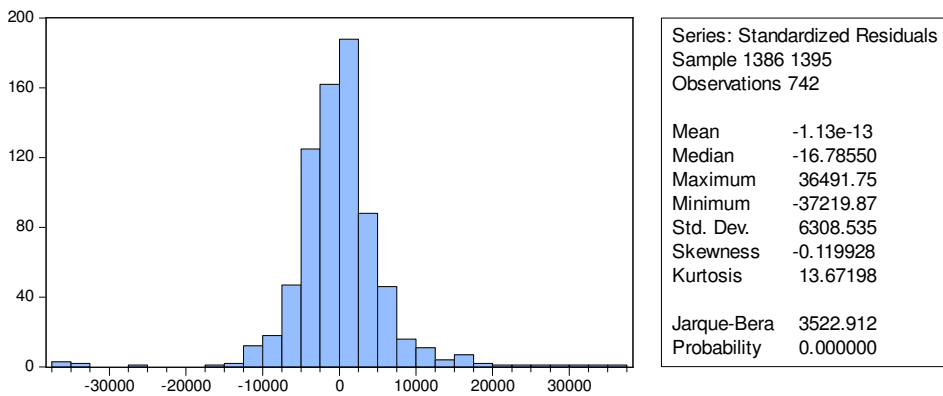
As shown in Figure 1 the regression model residual does not have a definite shape, and this also indicates that the model is fitted. The Jarque and Bera statistic is a chi-squared distribution of two degrees of freedom. If this statistic is smaller than 5.7, it can be concluded that the statistical distribution is normal according to the chi-squared table. Jarque and Bera use the following formula to check for normality:

$$JB = n \left\{ \frac{(Skew)^2}{6} + \frac{(Kurt - 3)^2}{24} \right\}$$

**Table 6.** Jarque - Bera test

Result	Significance level	Test statistic	Regression model waste
Normalization of the distribution of the model waste	<b>0.000</b>	<b>3522.9</b>	

As it is seen in Table 6 the significance level of the Jarque - Bera test is less than  $\alpha = 0.05$ , so the distribution of residuals is not normal with 95% confidence. In Fig. 8, the residual histogram of the regression model is presented.



**Figure 2.** Residual histogram

As shown in Figure 2, the regression model residual is symmetrical and bell-shaped, which suggests that, although the distribution of the regression model is not normal, but it is completely symmetrical and the model has no statistical problems. To verify the main hypothesis of the study, the appropriateness of the regression model is applied through the



F test. To evaluate the significance of regression model, F statistics were used. The zero hypothesis in the F test is as follows:

$$\begin{cases} H_0 : \beta_1 = \beta_2 = \dots = \beta_k = 0 \\ H_1 : \beta_1 \neq \beta_2 \neq \dots \neq \beta_k \neq 0 \end{cases}$$

Which is evaluated by the following statistics:

$$F = \frac{ESS / (K - 1)}{RSS / (N - k)}$$

According to F statistics, in this study the validity of the regression model is confirmed. Also t-test is used to examine the significant effect of variables on the dependent variable. In table 7 the relationships studied in the hypotheses are investigated.

**Table 7.** Important effects in the regression survey

Meaningful	the amount of	Desired effect
---	655.9565	Effect of asset yield on profits
---	-124.3609	Effect of Dividend Profit on Profit
---	-236.5344	Effect of entropy index on profitability

According to table7 the effect of different variables is determined.

## 5. Discussion and Conclusions

Due to the strategic importance of capital structure, many scholars have long been trying to illustrate that the emergence of different theories of capital structure is an evidence of this claim. Theories of capital structure, especially the theory of balance and pyramid arrangement, are influenced by cultural, behavioral, and organizational differences. So far, various theories about capital structure have been developed that have been the object of justifying and explaining the structure of corporate capital. It seems that attention to cultural, behavioral, and organizational differences can, to some extent, justify existing contradictions. One of the most important issues for financial economists is to identify the relationship between profitability and corporate finance decisions or capital structure. The optimal capital structure is to maximize company value and minimize the cost of capital. Achieving an

optimal capital structure to maximize profitability has always been a challenging topic for finance experts. Financial-sector researchers believe that diversification benefits only managers and makes them secure in a company, while shareholders endure the costs of directors' activity. But then, financing decisions and an optimal combination of capital structure on one hand, and the creation of cash flows and debt repayment capabilities, on the other hand, are issues that are important for decision makers. Stationarity tests were used to check the logic of the variables' behavior, and after ensuring the logical behavior of the variables over time and performing the correlation test to examine the probability of coexistence in the regression model, to determine the type of estimation of the Chave (F test) and Hausman tests, finally, these tests in the reviewed regression model voted for the data panel method and its effects were validated. To ensure that the data panel model is evaluated, the residue is normalized and graphical survey is performed. Finally, it was found that diversification strategy, capital structure and profitability in companies listed on the stock exchange have a meaningful relationship. The diversification strategy has a significant impact on profitability.

### References

- Aghaei Mohammad Ali, Kazempour Morteza .(1393). Investigating the relationship between product diversification strategyability and performance of listed companies in Tehran Stock Exchange. International Management Conference.
- Asadi Hadi, Emadi Farzad Safari Ghorban, Ghaffari Ghaziani Abbas. (1395). Investigating the relationship between capital structure and profitability in companies accepted in Tehran Stock Exchange, Third International Conference on Modern Research in Management, Economics and Humanities, Batumi, Georgia, Karin Conference Leading Institute.
- Boghomian Rafik, Azizzadeh Moghaddam, Keyvan.(1393). The Relationship Between Company Characteristics and Capital Structure. Empirical studies of financial accounting. Volume 11, Number 43, Pages 111-133.
- Sadeghi Shahedani Mehdi, Chavoshi Kazem, Mohseni Hossein. (1391). Modeling the relationship between profitability and capital structure in Tehran Stock Exchange with the approach of generalized torque panel. Quarterly Journal

of Financial Engineering & Securities Management Volume 3, Issue 11, Pages 17-42.

- Ghafourian Student Amir, Omid Rehab, Pourang Ali, Farhadi Sharif Abad Mohsen.(1395). Investigating the Relationship between Capital Structure and the Profitability of the Companies of the Paper and Printing Company, Adopted on the Stock Exchange, The First International Conference on Modern Research in Management Studies, Shiraz, Kharazmi High-Tech Institute of Science and Technology.
- Gerd Aziz, Waqfi Hesam, Fakouri Mohsen .(1393). Investigate the relationship between financial leverage (capital structure) criteria and performance measurement criteria. Accounting Research. Volume 4, Issue 3, Pages 1-18.
- Mehrani Sasan, Rasaiyan Amir.( 2007). Investigating the relationship between profitability ratios and capital structure in Tehran Stock Exchange. Empirical studies of financial accounting. Volume 5, Issue 18, Summer 2007, Pages 59-80.
- Namazi Mohammad, Shirzadeh Jalal. (1384). Investigating the relationship between capital structure and profitability of listed companies in Tehran Stock Exchange (with emphasis on industry type). Accounting and Auditing Reviews: Volume 12, Number 42; From page 75 to page 95.
- Bradley. Michael, Jarrell. Gregy A.And Kim. E. Ham, (1984). "On The Existence of Capital Structure: Theory And Evidence " Journal of Finance, VOL 3.
- Myers, S., & Male, N. (1984). Corporate Financing and Investment Decisions when Firm Have information that Investors Do not Have. The Journal of Finance, 13, 178-221.
- Petacchi Reining.(2015). Information asymmetry and capital structure: Evidence from regulation FD. Journal of Accounting and Economics. Volume 59, Issues 2–3, April–May 2015, Pages 143-162.
- Nirajini, Priya,K B. (2013). Impact of Capital Structure on Financial Performance of theListed Trading Companies in sri Lanka. International Journal of Scientific and Research Publications, Volume 3, Issue 5.
- Sun Ji. DingLi.(2016). Ownership, capital structure and financing decision: Evidence from the UK. The British Accounting Review Volume 48, Issue 4, December 2016, Pages 448-463 .
- JouidaSameh.(2017).Diversification, capital structure and profitability: A panel VAR approach. Research in International Business and Finance Available online 8 July 2017.

