

**EVALUATION OF NON-FINANCIAL FACTORS AFFECTING THE STOCK PRICE OF CAR COMPANIES
(ACCEPTED IN TEHRAN STOCK EXCHANGE)**

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ABSTRACT

Stock Exchange is as one of the main pillars of the capital markets, which with focus on macroeconomic variables, affects investment. In the stock exchange, in addition to the dividends received by shareholders, their investments are also subject to change, which in some cases increase of the stock price is much higher than their annual dividend. Therefore, predicting stock price on the stock exchange is important for investors. Given the importance of the issue, in this study non-financial factors effect on stock changes have been examined. To answer the research question and test the hypotheses, data related to stock price, media advertising, the volume of production, quality management, certification of the quality of products, number of employees, GDP, the size of the company area and the certification of the environmental conservation of six automaker companies listed on stock exchange during the six years between 2001 to 2006, and also the data of financial factors including stock price, price to earnings, earnings per share, price to book value and rate of return on equity of shareholders over 6 years and range between 2000 to 2005 and to 5 companies have been collected and analyzed. The study data are collected from the documents of stock exchange and the indexes of central bank collection, and the research is conducted with an applied purpose in correlational method and research data are analyzed by descriptive and inferential statistics. The obtained results showed that from among eight non-financial variables only two variables of the size of the company area and production of companies have a significant impact on the stock price changes. The impact of the size of the company area on the stock price changes is negative and the production volume impact is on the stock price changes is positive and significant. The impact of media advertising, management, certification of the quality of products, number of employees, GDP and certification of environmental conservation on the stock price change is not significant. From among financial factors, the impact of two variables of price to profit and earnings per share on stock prices change is direct and significant and the impact of two variables of price to book value and rate of return on equity of shareholders is not significant.

KEYWORDS: Stock Exchange, GDP, Non-Financial Factors

INTRODUCTION

Stock exchange status in the economy is considerable from both the micro and macro economy. In the microeconomic dimension, we can refer to the impact and good status of stock in the financial basket of household, which with growing trend of various companies there is a good share and profitability for them from stock market. Stock is not only useful for investors and investees, but it also has benefits for macroeconomic. The status of stock is meaningful first in a dynamic economy and then in an efficient stock market, and if a series of features that are necessary for a capital market or the properties that an economy must have do not exist, expectation of realization of these properties do not exist either. Stock exchange is as one of the basic pillars of the capital market and supply base for the units, which is accepted in them. By centralizing the capital optimized allocation in economic and social development, stock exchange affects macroeconomic variables. By mobilizing financial resources through the sale of shares rather than loans from banks, companies provide the needed funds from people public and pay annual interest in return, which in addition to providing current needs ensures future provision. A sense of participation in production activities and the business community by the people make them feel a sense of ownership and as well as a sense of belonging to the product and its development. In addition to the dividends received by shareholders their original investments are also subject to changes in the stock market that the increase in stock price is sometimes much higher than their annual

dividend. In financial decision making, investors are interested in knowing the market value of financial assets or the value of securities, because they buy and sell the securities of the companies. Evaluation by pricing financial assets is important from the perspective of financial management because they should make decision in a way that in order to achieve the goal of "maximizing shareholder wealth", increase the investment demand of investors for the purchase of their securities. Characteristic of unstable market prices always affects people in a range of risks. Due to the fact that automotive companies listed on Tehran Stock Exchange are of the investees of the capital market, forecasting their share prices on the stock exchange is of particular importance for investors and the ones involved in the market. Development and performance of these companies and on the whole companies listed on the stock exchange leads to the prosperity and development of the stock exchange. Trust and satisfaction of investors from these companies make them be successful and boom. Correct and optimal stock price attracts more investors and brings about their pleasure. So being aware of price changes can help investors in choosing to buy and invest. Changes in stock price are influenced by financial and non-financial factors. In this study, non-financial factors affecting the stock price changes of car companies listed on Tehran Stock Exchange have been investigated.

Research purpose

The aim of this study was to investigate the role of non-financial factors on stock prices and securities of car companies listed on the Tehran Stock Exchange. To get the main objective of the study, secondary objectives are also raised. Secondary objectives of the study include: 1) investigating the relationship between media advertising of firms accepted in Tehran Stock Exchange car and their price changes; 2) investigating the relationship between the management of car companies accepted in Tehran Stock Exchange and the price changes of these companies; 3) investigating the relationship between the number of employees of car companies listed on the Tehran Stock Exchange and the price changes of these companies; 4) investigating the relationship between quality certification and product quality of automotive companies listed on Tehran Stock Exchange and the price changes of these companies; 5) investigating the relationship between environmental certification of automotive companies listed in Tehran Stock Exchange and the price changes companies; 6) investigating the relationship between the size of the space of vehicle companies listed on the Tehran Stock Exchange, and price changes of these companies; 7) investigating the relationship between GDP, and changes in production volume of automotive companies listed on Tehran Stock Exchange and the price changes of these companies 8) studying the relationship between social activities of automotive companies listed on Tehran Stock Exchange and the price changes of these companies.

Theoretical Framework

At present, one of the major issues that financial firms face is the significant difference and considerable distance between the reflected value in the balance sheet and market value. The main reasons for this difference are the stimuli that are sources of value creation for the firm, but they are not reflected in the books and accounts. Of these factors organizational knowledge, customer's satisfaction, innovation in offering products and staff morale and loyalty can be mentioned that none of them are converted to numbers and dollars and are not reflected in the books and financial statements. Lack of reflection is the main source of value creation for the firms that financial reports and indicators cannot reflect the firm value. Currently, capital markets rely on reports that measure the firm and the firm's management performance from several aspects, and give a clear picture of the future and stability of the firm's capabilities to provide income. Such reports are the result of a combining financial and nonfinancial data and statistics. To respond to such needs from shareholders and the capital market, management accountants have developed and used new indicators that are tested in many large organizations and companies and efficiently become the base for decision-making by investors. Major and advanced capital markets, has mandated producing and reflecting these reports and indicators, and using these reporting models, related tools and techniques that are developed from the field of management accounting and become the agenda of accountants and learning them and getting familiar with them is today's agenda. (Fakharian, 2007).

Conceptual and operational definitions of words

- 1- The common stock: This share represents ownership in the company and a shareholder of ordinary shares in proportion to the shares of the owner from the company whole shares that are considered as in ownership of the owner. Common stock has no maturity and is a permanent source of financing, and it is considered as one of the most expensive sources of financing.
- 2 - Stock Exchange: Stock Exchange is a special market in which securities trade is done by exchange brokers in accordance with relevant regulations.
3. Securities: it includes the shares of joint stock companies, export deposit, bonds and bonds issued by companies, municipalities and institutions linked to the government and treasury, which are negotiable and clearing. At the moment, in the Tehran Stock Exchange, only securities are traded that have been issued by the Iranian institutions and is acceptable to the Accepting Board.
4. Price: It is the rate for each unit of securities issued by brokers. The price of the securities is the amount of money a person needs to pay in the present to earn future cash receipts. (Piety, 1998)
5. Changes in the price: the price of the final result of the confrontation between the forces of supply and demand for the company's stock. Followers of this theory use exchange equation to explain price changes. (Ziai Bigdeli and Mahdipour 1990: 239) The amount of money paid annually for getting each of unit of securities is known as changes in the stock price of the company.
6. Number of employees: If more units of production unit gradually add labor input variable to used fixed inputs, first produced per unit of labor input, add more and more total output value. In other words, the marginal product range increases. After a certain level of employment of variable inputs, per unit of variable inputs adds less and less value to the total product that is the final product is reduced. Finally, if productive variable input increase continues may be due to the addition of a new unit of the input variable, the value of gross output stay constant and if it continues to rise from now on, reduction in total output may be observed. In economics law this is called the ultimate diminishing returns. (Dehgani, 2004: 158) To determine this trait of company, it is referred to the number of employees in the company each year.
7. The size of firm: Size of the firm makes production diversity possible, and this in turn leads to further support of the firm. Galbraith said that industrial production in the current era calls for complex technical procedures and the coordination of specialized knowledge. This has led experts to jointly work and get the real power in their hands. (Erfanmanesh, Jam e Jam Payper) To identify this feature of the company, it is referred to the added infrastructure of company compared to the previous year.
8. Quality Certification: These are standards that are called by the International Organization (ISO) as ISO 9000 series and guide the directors in governance of the organization. These standards study the overall structure of an organization or company in all sectors including design, engineering, inspection, processing, installation of utilities, research and development, sales and after-sales service and even supplying resources of the contract with the organization. (Husseini, 2002) To identify this feature of the company, it is referred to company received certificates in quality and product quality
9. Environmental preservation certificate: requirements of the society to job safety and health, environmental protection, saving in energy and products have been the reason for standards such as ISO 14000 series of standards that recognize management systems as a key element in this area and try to determine and impose its own standards for each industry. (Farazmand, 2000) To identify this feature of the company, it is referred to received certification of company in the field of environmental protection.
- 10 GDP: GDP is the total monetary value of final goods and services produced within a country in a given year (GDP) minus the monetary value of goods and services produced domestically by foreigners plus monetary value of goods and services produced by its citizens in other foreign countries. (Sabaghian, 2007)

Research territory

Subject domain: research is in the field of financial management, and studies the car companies available in the realm of time and space from the local aspect. Location realm of the research is Tehran Stock Exchange and the time scope of the study is a period of 6 years from 2001 to 2006.

MATERIALS AND METHODS

The research methodology is one of the major factors that affect research and its results, and often depends on the purpose of research, the nature of the subject, executive features of research and hypotheses developed. Regarding the aim, the present study is applied and due to the nature of the subject and the hypotheses, it is carried out in a descriptive and correlation method, and considering time, it is a cross-sectional study. In descriptive method, the aim of the research is a detailed description of a situation or a series of conditions. The purpose of this research is to answer questions such as "how much?" (Khaki, 2003: 211). In a correlational study, the main objective is to determine if there is a relationship between two or more measurable variables? And if there is, how much is it?

Data Collection

For data collection of the study, various tools were used. To collect the data related to theoretical basis and research literature, library, Internet search and digital library were used and to gather statistical data organizational documents, interviews and questionnaires are used.

Validity and reliability of measuring tools of the study

Validity means to what extent the method or tool used can truly measure the intended character, while reliability deals with the accuracy and repeatability. Although measuring tool can be valid without reliability, the opposite is not true. In other words, having an appropriate level of validity is necessary and basic condition for reliability. (Marnat, 1996: 47)

As company statistics and data used in the study are published by the Tehran Stock Exchange official statistics as a source of reliable data so the data are reliable. Also, as research variables are gathered on the basis of standard features and has measured the intended traits as an appropriate tool it has validity. The only issue whose validity is not sure is measuring management based on change or not change of management. Generally, validity and reliability of the measured variables depending on measuring tools and scales is approved.

The population

The population is a group of people who share one or more traits that are of interest to researchers. (Bast 1995: 24) The population of the present study is automotive companies that are listed on Tehran Stock Exchange from 2001 to 2006. The numbers of car companies listed on the stock exchange are 6 companies.

Sample and sampling methods

One of the most important and most sensitive parts of scientific research is the selection of the sample. Sample is a smaller group of society that is selected for observation and analysis, and by observing the traits that are chosen from a sample of a population, we can deduce certain characteristics of the whole society. (Bast 1995: 24) Given that the number of car companies listed on the Tehran Stock Exchange is few, so all companies, in other words the entire population is studied and the sample is equal to the population. The number of surveyed companies is 6 companies, whose 6 years' information about the variables studied during the years 2001 to 2006 will be examined.

Data analysis

Determining the accuracy of research hypothesis regarding the classification, summarization and analysis of information are the most important stage of research because the researcher concludes from his efforts at this stage. Therefore, to obtain valid results, this step requires careful research and the use of appropriate statistical techniques for data analysis to test the research hypothesis. To analyze the data, descriptive and inferential statistics are used. By using descriptive statistics, in addition to the classification and regulation of raw data, frequency tables, percentages, statistics, agreement tables, frequency charts and center tendency indicators, and distribution of research variables are calculated. Using inferential statistics, research hypotheses are tested and using probability theory hypotheses are judged. Since the study subject is to investigate the relationship between research variables, so correlation, regression and consistency relations are used. In this study, the purpose is to determine the coordination of changes of two or more variables. For this purpose, in terms of measuring scales variables, the Pearson correlation coefficient test,

Spearman correlation coefficient and test-related indicators (consistency) based on chi square such as coefficients of agreement, the coefficient of correlation F_i and Kramer and testing relationships parameters based on relative decrease of error like Landa, uncertainties and measures of correlation coefficient Gamma, Summers, bars and measures ETA, kappa and risk were used due to the nature of the assumptions and parameters.

Describing data

Describing study data is another process of analysis and statistical procedures of scientific research. Data of non-financial factors studied data is composed of 6 company from 2001 to 2006 and financial data of five companies from 2000 to 2005. In this study raw data were collected and changed to research variables and indicators of descriptive variables of studied variables including frequency, frequency percentage, middle, view, mean, variance and standard deviation are shown in Tables 1 to 3.

Table 1: descriptive indicators of non-financial variables of studied companies

Variables	Frequency	Lost value	Average	SD	Variance
Stock price	36	0	8.2461	0.78216	0.612
Advertisement	36	0	9.4838	1.26000	0.588
Number of employees	36	0	8.4937	1.28464	1.650
Production volume	36	0	11.5839	2.12585	4.519
Size	36	0	13.7425	2.96318	8.780
GNP	36	0	13.7949	0.26785	0.072
GNP without oil	36	0	12.7483	0.10875	0.012
GNP with oil	36	0	12.9057	0.17474	0.031

Table 1: descriptive indicators of non-financial variables of studied companies

Variables and their categories		Frequency	Percent	Middle	View
Product quality	Non-existence	5	13.9	Existence	Existence
	Existence	31	86.1		
	Total	36	100.0		
Environment	Non-existence	15	41.7	Existence	Existence
	Existence	21	58.3		
	Total	36	100.0		
Manager	Previous	24	66.7	Previous (no change)	Previous (no change)
	Next	12	33.3		
	Total	36	100.0		

Table 3. Descriptive indicators of financial variables studied

Variables	Frequency	Lost value	Average	SD	Variance
Stock price	30	0	8.5432	0.57128	0.326
Price to Earnings	30	0	1.9338	0.69168	0.478
Price to Book Value	30	0	1.2111	0.66899	0.448
Earnings per share	30	0	6.6093	0.65583	0.430
Rate of return on equity of shareholders	30	0	-0.7214	0.71065	0.505

Analysis of the nature and characteristics of research variables

Studied variables have quantity scale. The purpose of the study is investigating the relationship between variables that it is expected the dependent variable and independent variables are related. So the relationship between the variables studied is bi-variables are multi-variables. Given that the level of measuring variables is distance and the purpose of the survey is setting a relationship between variables, so to test research hypotheses correlation and partial correlation and regression analysis are suitable. Needed conditions and assumptions to use correlation and regression analysis exist and they have been used to test research hypotheses. To investigate the relationship between stock prices virtual regression is used. The results of distribution of variables using Kolmogorov-Smirnov test are shown in Tables 4 and 5. Distribution of financial variables is normal and from among the distribution of non-financial variables only GDP with oil variable is not normally distributed variables and other variables have normal distribution.

Table 4: The results of distribution of financial variables studied

Variables	Z statistics	SD	Results
Stock price	0.509	0.958	Variable distribution is normal.
Price to Earnings	0.834	0.491	Variable distribution is normal.
Price to Book Value	0.597	0.867	Variable distribution is normal.
Earnings per share	0.780	0.577	Variable distribution is normal.
Rate of return on equity of shareholders	0.537	0.935	Variable distribution is normal.

Table 4: The results of distribution of non-financial variables studied

Variables	Z statistics	Level of error	Results
Stock price	0.481	0.975	Variable distribution is normal.
Advertisement	0.812	0.524	Variable distribution is normal.
Number of employees	0.767	0.599	Variable distribution is normal.
Production volume	1.042	0.228	Variable distribution is normal.
Size	1.123	0.160	Variable distribution is normal.
GNP	0.829	0.497	Variable distribution is normal.
GNP without oil	0.687	0.733	Variable distribution is normal.
GNP with oil	1.364	0.048	Variable distribution is not normal.

Testing research hypotheses

First hypothesis: media advertising of car companies listed on Tehran Stock Exchange has a correlation with stock price changes of companies.

The null hypothesis: media advertisement is not associated with price changes.

Hypothesis: media advertisement is associated with price changes.

$$\left\{ \begin{array}{l} H_0: r \leq 0 \\ H_1: r > 0 \end{array} \right.$$

$$r = 0/257 \quad p = 0/065 \quad p > 0/05$$

The correlation between price changes with the amount of media advertising with value of 0.257 at 0.05 error is not significant; although, it has a high positive correlation. Thus, null hypothesis is not rejected. As a result the

research hypothesis cannot be accepted. Due to the fact that the influence of other variables in the relationship between dependent and independent variables has some information that pollute the results, so the relationship between two variables is tested using partial correlation coefficients and neutralizing the effects of other variables of research, and the correlations between media advertising and price changes is significant.

$$\left\{ \begin{array}{l} H_0: r_p = 0 \\ H_1: r_p > 0 \end{array} \right.$$

$$r_p = 0/497 \quad p = 0/016 \quad p < 0/05$$

Test result: the relationship between the variables of media advertising and automotive and stock price of companies listed on Tehran Stock Exchange is not significant. By controlling independent variables of the number of employees, volume of production, size and GDP, the relationship between the media advertising and company's stock price is directly significant.

Table 6: Results of the Pearson correlation between media advertising and stock prices

Test result	Advertisement	Index	Variable
Relationship is not significant	0.257	Pearson correlation	Stock price
	0.065	Significance level of a domain	
	36	Frequency	

Table 7: The result of partial correlation test between media advertising and stock prices

Control variables	Variable	Index	Advertisement	Test result
Number of employees Production volume Size GDP	Stock price	Pearson correlation	0.479	Relationship is significant
		Significance level of a domain	0.016	
		Level of freedom	18	

$$\left\{ \begin{array}{l} H_0: r \leq 0 \\ H_1: r > 0 \\ \\ r = -0/60 \quad p = 0/000 \quad p < 0/01 \end{array} \right.$$

The second hypothesis: regarding the area, the size of the car companies accepted on Tehran Stock Exchange has a correlation with stock price changes of companies.

The null hypothesis: the size of the companies is not associated with price changes.

Hypothesis: the size of the companies is associated with price changes.

The correlation between the size of companies with price changes with value of -0.60 at 0.01 level of error is significant. Since the correlation is significantly less than zero, so the null hypothesis is preserved as true. As a result the research hypothesis cannot be accepted. In other words, the relationship between the size of the companies and price changes is negatively significant. Due to the fact that the influence of other variables in the relationship between dependent and independent variables has some information that pollute the results, so the relationship between two variables is tested

using partial correlation coefficients and neutralizing the effects of other variables of research, and the correlations between size of companies and price changes is negatively significant.

H0: $r_p=0$
H1: $r_p >0$

$r_p = -0.787$ $p = 0.000$ $p < 0.01$

Test: the relationship between the variable of size of the company and the stock price of the car companies listed on Tehran Stock Exchange is significantly negative. By controlling independent variables of the number of employees, volume of production, media advertisement and GDP, the relationship between the variable of size of the company and stock price is still significantly negative.

Table 8: Results of Pearson correlation test between the variable of size and stock prices

Variable	Index	Size	Test result
Stock price	Pearson correlation	-0.600	Relationship is significant
	Significance level of a domain	0.000	
	Frequency	36	

Table 9: Results of partial correlation test between the variable of size and stock prices

Control variables	Variable	Index	size	Test result
Number of employees Production volume Advertisement GDP	Stock price	Pearson correlation	-0.787	Relationship is significant
		Significance level of a domain	0.000	
		Level of freedom	18	

The third hypothesis: in terms of human resources, the size of the car companies accepted on Tehran Stock Exchange has a correlation with stock price changes.

H0: $r \leq 0$
H1: $r > 0$

$r = -0.104$ $p = 0.273$ $p > 0.05$

The null hypothesis: the number of human resources is not associated with price changes.

Hypothesis: the number of human resources is associated with price changes.

The correlation between the number of employees with price changes with value of -0.104 at 0.05 level of error is not significant. Thus, null hypothesis is not rejected. As a result research hypothesis can be accepted. In other words, there is no relationship between the number of employees and changes in price. Due to the fact that the influence of other variables in the relationship between dependent and independent variables has some information that pollute the results, so the relationship between two variables is tested using partial correlation coefficients and neutralizing the effects of

other variables of research, and the correlations between number of employees and price changes is negatively significant.

$$\left\{ \begin{array}{l} H_0: r_p=0 \\ H_1: r_p >0 \\ r_p = -0.252 \quad p=0.142 \quad p > 0.05 \end{array} \right.$$

Test result: the relationship between number of employees and stock price of car companies listed on Tehran Stock Exchange is not significant. By controlling independent variables of size of companies, volume of production, media advertisement and GDP, the relationship between the variable of number of employees and stock price is still not significant.

Table 10: Results of the Pearson correlation between number of employees and stock prices

Variable	Index	Number of employees	Test result
Stock price	Pearson correlation	-0.104	Relationship is not significant
	Significance level of a domain	0.273	
	Frequency	36	

Table 11: Results of partial correlation test between the variable of number of employees and stock prices

Control variables	Variable	Index	number of employees	Test result
Company size Production volume Advertisement GDP	Stock price	Pearson correlation	-0.252	Relationship is not significant
		Significance level of a domain	0.142	
		Level of freedom	18	

$$\left\{ \begin{array}{l} H_0: r \leq 0 \\ H_1: r > 0 \\ r = 0.446 \quad p=0.003 \quad p < 0.01 \end{array} \right.$$

The fourth hypothesis: changes in production volumes of car companies accepted on Tehran Stock Exchange have a correlation with stock price changes.

The null hypothesis: changes in production volume are not associated with price changes.

Hypothesis: changes in production volumes are associated with price changes.

The correlation between the volume of production and change in the price with value of 0.446 at 0.01 level of error is significant. Thus, null hypothesis is rejected and the hypothesis is preserved as true. In other words, there is a direct relationship between the volume of production and price changes. Due to the fact that the influence of other variables in the relationship between dependent and independent variables has some information that pollute the results, so the

relationship between two variables is tested using partial correlation coefficients and neutralizing the effects of other variables of research, and the correlations between volume of production and price changes is positive and significant.

$$\left\{ \begin{array}{l} H_0: r_p=0 \\ H_1: r_p >0 \end{array} \right.$$

$$r_p = 0/412 \quad p = 0/035 \quad p < 0/05$$

Test result: the relationship between volume of production and stock price of car companies listed on Tehran Stock Exchange is significant. By controlling independent variables of size of companies, number of employees, media advertisement and GDP, the relationship between volume of production and stock price is still positive and significant.

Table 12: Results of the Pearson correlation between volume of production and stock prices

Variable	Index	volume of production	Test result
Stock price	Pearson correlation	0.446	Relationship is significant
	Significance level of a domain	0.003	
	Frequency	36	

Table 13: Results of partial correlation test between the variable of volume of production and stock prices

Control variables	Variable	Index	Volume of production	Test result
Company size Number of employees Advertisement GDP	Stock price	Pearson correlation	0.412	Relationship is significant
		Significance level of a domain	0.035	
		Level of freedom	18	

Fifth hypothesis: changes in the level of GDP of car companies accepted on Tehran Stock Exchange have a correlation with stock price changes.

The null hypothesis: changes in the level of GDP are not associated with price changes.

Hypothesis: changes in the level of GDP are associated with price changes.

$$\left\{ \begin{array}{l} H_0: r \leq 0 \\ H_1: r > 0 \end{array} \right. \quad r = 0/248 \quad p = 0/121 \quad p > 0/05$$

The correlation between GDP and price changes is not significant with the value of 0.248 at error level of 0.01. Thus, this null hypothesis is not rejected. In other words, there is no significant correlation between price changes. Due to the fact that the influence of other variables in the relationship between dependent and independent variables has some information that pollute the results, so the relationship between two variables is tested using partial correlation

coefficients and neutralizing the effects of other variables of research, and the correlation between GDP and price changes is not significant.

$$\left\{ \begin{array}{l} H_0: r_p=0 \\ H_1: r_p >0 \end{array} \right.$$

$$r_p = 0/107 \quad p = 0/327 \quad p > 0/05$$

Test result: the relationship between GDP and stock price of car companies listed on Tehran Stock Exchange is not significant. By controlling independent variables of size of companies, number of employees, media advertisement and production volume, the relationship between GDP and stock price is not still positive and significant.

Table 14: Results of the Pearson correlation between GDP and stock prices

Variable	Index	volume of production	Test result
Stock price	Pearson correlation	0.248	Relationship is significant
	Significance level of a domain	0.121	
	Frequency	24	

Table 15: Results of partial correlation test between the variable of GDP and stock prices

Control variables	Variable	Index	GDP	Test result
Company size Number of employees Advertisement Volume of production	Stock price	Pearson correlation	0.107	Relationship is not significant
		Significance level of a domain	0.327	
		Level of freedom	18	

The relationships between the GDP without oil and GDP with oil stock price changes are tested. The correlation between the value GDP without oil and with price changes with value of 0.045 and the relationship between GDP with oil with value of 0.035 at errors level of 0.5 are not significant. So between the GDP without oil and with oil there is no significant relationship with price changes. Also, using partial correlation coefficients and undoing the effects of other variables are tested and Pearson correlation between GDP without oil and the GDP with oil and price changes are not still significant. The results of Pearson correlation coefficient and partial correlation coefficient are shown in tables 4-16 and 4-17.

Table 16: Results of the Pearson correlation between GDP and stock prices

Variable	Index	GDP without oil	GDP with oil	Test result
Stock price	Pearson correlation	0.045	0.035	Relationship is not significant
	Significance level of a domain	0.397	0.421	
	Frequency	36	36	

Table 17: Results of partial correlation test between the variables of GDP and stock prices

Control variables	Variable	Index	GDP without oil	GDP with oil	Test result
Company size Number of employees Advertisement Volume of production GDP	Stock price	Pearson correlation	0.320	0.228	Relationship is not significant
		Significance level of a domain	0.091	0.174	
		Level of freedom	17	17	

Sixth hypothesis: How to manage the car companies accepted on Tehran Stock Exchange has a correlation with stock price changes.

The null hypothesis: how to manage the company has no relationship with stock price.

Hypothesis: how to manage the company has relationship with stock price.

$$\left\{ \begin{array}{l} H_0: \beta=0 \\ H_1: \beta>0 \\ \\ B = -0.245 \quad t = -1.472 \quad p > 0.05 \end{array} \right.$$

Since the absolute value of the t-statistic calculated is smaller than the critical value, the null hypothesis is not rejected. As a result, the null hypothesis has been maintained as the correct hypothesis. In other words, the hypothesis is rejected and it cannot be accepted that there is relationship between the management and the stock prices of listed companies on Tehran stock exchange.

Table 18: Results of virtual regression analysis (apparent) between management and stock prices and stock prices

Level of error	statistics	Standardized coefficients	not standardized coefficients	Variable
0.000	22.823		8.780	Constant
0.150	-1.472	-0.245	-0.401	Manager

Seventh hypothesis: certification of goods quality such as ISO certification of car companies accepted on Tehran Stock Exchange has a correlation with stock price changes.

The null hypothesis: the certification of product quality of the company does not affect stock price.

Hypothesis: the certification of product quality of the company affects stock price.

$$\left\{ \begin{array}{l} H_0: \beta=0 \\ H_1: \beta>0 \\ \\ B = 0.319 \quad t = 1.961 \quad p > 0.05 \end{array} \right.$$

Since the absolute value of the t-statistic calculated is smaller than the critical value, the null hypothesis is not rejected. As a result, the null hypothesis has been maintained as the correct hypothesis. In other words, the hypothesis is rejected and it cannot be accepted that there is relationship between quality certificates of goods and the stock prices of listed companies on Tehran stock exchange.

Table 19: Results of virtual regression analysis (apparent) between quality certificates and stock prices

Level of error	statistics	Standardized coefficients	not standardized coefficients	Variable
0.000	22.694		7.634	Constant
0.058	1.961	0.319	0.711	Goods quality

Eighth hypothesis: certification of environment preservation certificates of car companies accepted on Tehran Stock Exchange has a correlation with stock price changes.

The null hypothesis: the certification of environment preservation of the company does not affect stock price.

Hypothesis: the certification of environment preservation certificates of the company affects stock price.

$$\left\{ \begin{array}{l} H_0: \beta=0 \\ H_1: \beta>0 \end{array} \right.$$

$$B = -0.023 \quad t = -0.134 \quad p > 0.05$$

Since the absolute value of the t-statistic calculated is smaller than the critical value, the null hypothesis is not rejected. As a result, the null hypothesis has been maintained as the correct hypothesis. In other words, the hypothesis is rejected and it cannot be accepted that there is relationship between environment preservation certificates and the stock prices of listed companies on Tehran stock exchange.

Table 21

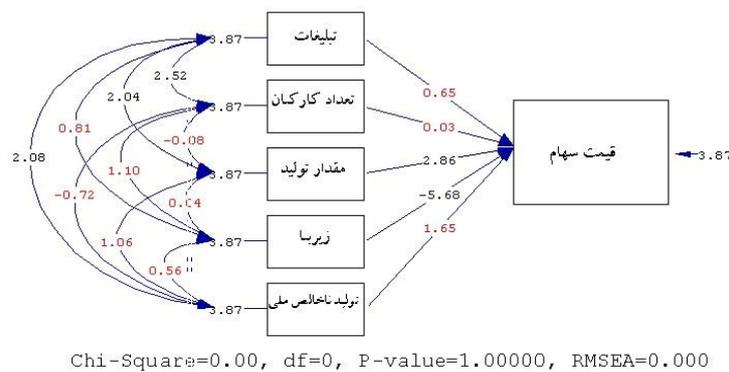
Level of error	statistics	Standardized coefficients	not standardized coefficients	Variable
0.000	40.358		8.267	Constant
0.894	-0.134	-0.023	-0.036	Environment

Other research findings

Studying the effect of non-financial independent variables on the dependent variable share price

Since the five independent variables studied have quantitative scale, so model fitness multiple regression analysis was used. For this analysis structural equation has been used and the results are shown in Diagram 1. Based on root mean square of errors (RMSEA), which is smaller than 0.05 and also based on square (Chi-Square) whose significance level is greater than 0.05, the model obtained from the research data is appropriate. Judging statistics about the whole model and judgment on each of the research variables are shown in Diagram 1.

Diagram 1: diagram of structural equation between non-financial variables and stock prices

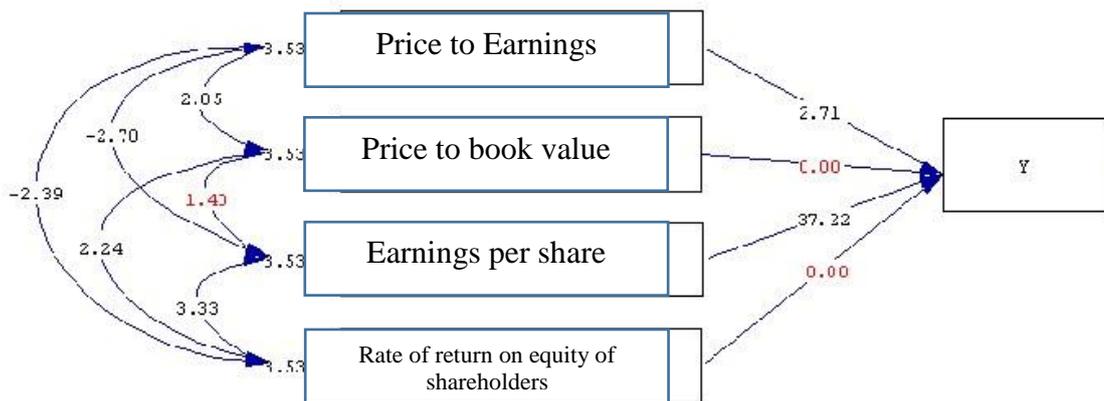


According to T-statistics between independent variables studied and variable of volume of production direct, size (infrastructure) reversely affects the stock price of car companies listed on Tehran Stock Exchange. Other three variables including advertising, the number of employees and the amount of GDP do not have a significant impact on the stock price.

2. Studying the effect of independent financial variables on the dependent variable share prices

Given that the four independent variables studied have quantitative scale, so for model fitness multiple regression analysis was used. For this analysis, structural equation is used and the results are shown in Diagram 2. Based on root mean square of errors (RMSEA), which is smaller than 0.05 and also based on square (Chi-Square) whose significance level is greater than 0.05, the model obtained from the research data is appropriate. Judging statistics about the whole model and judgment on each of the research variables are shown in Diagram 2.

Diagram 2: diagram of structural equation between financial variables and stock prices



Chi Square=0.00, df=0, P value=1.00000, RMSEA=0.000

Based on T-statistics from among independent financial variables studied in the research, variables price to earnings (P/E) and earnings per share (EPS) directly and significantly impact stock prices of car companies listed on the Tehran Stock Exchange. Other two variables including the rate of return on equity (ROE) and price to book value (P/B) have no significant impact on the stock price.

The results of testing hypotheses

The results of the first to fifth research hypothesis which are tested using Pearson's correlation coefficient, partial correlation coefficient test and regression analysis are shown in Tables 21 to 23. Results of hypothesis sixth, seventh and eighth using apparent regression analysis are shown in Table 24.

Table 21: The results of testing hypotheses based on Pearson correlation

Number of hypothesis	Null hypothesis	Hypothesis
	Correlation is zero or less	Correlation greater than zero
First hypothesis	<input type="checkbox"/>	<input type="checkbox"/>
Second hypothesis	<input type="checkbox"/>	<input type="checkbox"/>
Third hypothesis	<input type="checkbox"/>	<input type="checkbox"/>
Fourth hypothesis	<input type="checkbox"/>	<input type="checkbox"/>
Fifth hypothesis	<input type="checkbox"/>	<input type="checkbox"/>

Table 22: The results of testing hypothesis, based on the partial correlation coefficient by controlling independent variables

Number of hypothesis	Null hypothesis	Hypothesis
	Correlation is zero or less	Correlation greater than zero
First hypothesis	<input type="checkbox"/>	<input type="checkbox"/>
Second hypothesis	<input type="checkbox"/>	<input type="checkbox"/>
Third hypothesis	<input type="checkbox"/>	<input type="checkbox"/>
Fourth hypothesis	<input type="checkbox"/>	<input type="checkbox"/>
Fifth hypothesis	<input type="checkbox"/>	<input type="checkbox"/>

Table 23: The results of testing hypothesis test on regression analysis

Number of hypothesis	Null hypothesis	Hypothesis
	Beta is equal to zero.	Beta is not equal to zero.
First hypothesis	<input type="checkbox"/>	<input type="checkbox"/>
Second hypothesis	<input type="checkbox"/>	<input type="checkbox"/>
Third hypothesis	<input type="checkbox"/>	<input type="checkbox"/>
Fourth hypothesis	<input type="checkbox"/>	<input type="checkbox"/>
Fifth hypothesis	<input type="checkbox"/>	<input type="checkbox"/>

Table 24: The results of testing hypothesis based on Pearson correlation

Number of hypothesis	Null hypothesis	Hypothesis
	Beta is equal to zero.	Beta is not equal to zero.
Sixth hypothesis	<input type="checkbox"/>	<input type="checkbox"/>
Seventh hypothesis	<input type="checkbox"/>	<input type="checkbox"/>
Eighth hypothesis	<input type="checkbox"/>	<input type="checkbox"/>

CONCLUSIONS

The impact of eight non-financial variables including: media advertising, production volume, quality of management, certification of the quality of products, number of employees, GDP, the size of the company and the certification of the environmental preservation on stock price changes of automotive companies listed on the Stock Exchange Tehran has shown that only two of the eight variables size of companies and production volume of companies have a significant impact on stock price changes. The impact of the size of companies on stock price is negative, and the impact of production volume on stock price is positive and significant. The relationship between media advertisement with price changes, although not significant, it has high correlation. The impact of other non-financial variables on changes of stock prices is not significant. The impact of four independent financial variables including: price to earnings, earnings per share, price to book value and rate of return on equity on stock price changes is studied and the impact of price to earnings and earnings per share on stock price changes has been observed as positive and significant and the impact of the variables price to book value and rate of return on equity is not significant.

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