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# Investigation of the Effect of Leverage and CEO Education on Shareholders Return of Companies in Tehran Stock Exchange

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**Abstract:** Debt as a funding source has been considered by many Tehran Stock Exchange companies. Beside the beneficiaries of financial leverage such as tax-shield, excessive financing with loan capitals bring about an increase in risk and financial crisis following the bankruptcy of firms. Since, the use of high leverage increases financial risk, shareholders would demand a higher return to compensate them for the added risk. Researchers in behavioral finance and management argue CEO characteristics such as educational background affect the process of decision-making in firms. In this study, the effect of the company's capital structure on shareholder returns is analyzed through resource-based view theory and upper echelon theory. In order to review the issue, financial data of 100 firms along with CEOs education informations of these firms are examined during 2008-2013. We employ fixed effects panel data estimation to analyze the effect of CEO education level on shareholder return. The regression analysis is carried out by EViews Software using time series and cross-sectional data. The results of study indicate there is a significant relationship between financial leverage and shareholders return. In addition, the findings show non-significant relationship between CEO education level and shareholders return in Tehran Stock Exchange companies.

**Key words:** Leverage, shareholders return, CEO education, upper echelon theory, risk

## INTRODUCTION

In modern world by increasingly economic growing, the role of top managers became undeniable in determining the optimum capital structure; the structure that gives most revenue and lowest risk to company by increasing shareholders wealth in long-term. In recent years, applying financial leverage by companies in Tehran Stock Exchange due to far distance of financing cost via banks and stock marketsfirms have tended to have higher leverage. As a result, different leverage funding by companies bring different expected returns to investors.

Although, increment in return leads to an increase in firm's value but risk associated with this type of financing reduces amount of it. According to free cash flow hypothesis (Jensen, 1986), debt decreases the amount of cash available to managers, hence reducing their possibilities for wasting corporate resources. Equity does not have such advantage because shareholders' claims are residual, not obligatory. It means that managers can delay the payment of dividends for next year or longer while they have to pay interest and principal on time. In such a way leverage serves as a commitment and incentive mechanism. It induces managers to pay out cash to firm's investors and basically minimizes agency costs of external equity.

Thus, CEOs and CFOs should determine a structure to increase firm's value along with increasing return compatible with risk. Notable point is that making financial decisions are correlative and consecutive and not be taken for only 1 time and evermore. Therefore, the important point is that top managers conceive the effect of these decisions on company's value to achieve to basic purpose, maximizing shareholders' wealth considered by all investors of firm. Upper-echelon theory states top managers of firm as a critical source for making the firm successful because they have a significant effect on strategic decisions and making them successful. It predicts that the performance of firm partially determined by managerial characteristics which are observable, particularly formal education and experience (Carpenter and Sanders, 2004). CEO education and experience are indispensable for strategic decision-making because they act as indicators in determining firm performance (Wang *et al*., 2011).

On the other hand, shareholders are always seeking the ways to evaluate managers' performance for wealth-creating for company and estimate their future performance and in practice it can be seen they find inappropriate information and criteria for judging managers' performance. Lack of using the appropriate measure for evaluating performance and value creating

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may cause stock price of firms are not to be close to their real value and the outcome of this eventually will bring losses to a group of shareholder and profit for another group.

The objective of this study is to identify the relationship between education levels of CEOs with shareholders return. For fulfil this objective, we first try to examine empirically the impact of leverage on shareholders return of Tehran Stock Exchan gecompanies. Second, we employ one of the CEO characteristic that is educational level to investigate the impact of cognitive ability of CEO on shareholders return.

**Literature review:** In recent years, overusing of leverage in capital structure by top managers is one of the main factors which lead to increment in risks and returns of shareholders. According to corporate finance theory, the most general issue that many companies faced it is increasing required cash for capital expenditures. This issue is related to the financing method of company, investing decisions, capital structure of company and specially the proportions of equity and debt which form company's capital. Indeed general purpose of any company is increasing value and then increasing cash fund should be paid to investors. Debt rate in capital structure is related to the method for apportioning cash fund among shareholders and creditors and the value of company is also based on this distribution.

Ben (2012) and Ahmad *et al*. (2012) investigate the impact of financing decision on return and find that leverage is positively related to return. Abor (2007) used a panel data approach on 160 Ghanaian and 200 South African SMEs where he tested the relationship between leverage ratios and performance of the firms. He suggests that higher leverage ratios would negatively affect a firm's performance, since firms rely extremely on borrowing they will not receive tax shields and this lead to an increase in borrowing costs which may expose the firms to bankruptcy risks and reduce the return.

Arbabiyan and Safari (2009) analyze the impact of leverage ratios of 100 Iranian publicly listed firms on their performance over the period 2001-2007. They found that short-term and total debts are positively related to profitability measured by ROE but found a negative relationship between long term debts and ROE. Furthermore, Salteh *et al*. (2009) studied the link between capital structure and firm performance for 28 firms listed on the Tehran Stock Exchange for the period 2005 through 2009. They illustrate that when firm performance is measured by return on equity and Tobin's Q, it reflects a significant positive link with capital structure.

Usually, the most important criterion for evaluating management performance is currently return on equity. This criterion has information content for investors and is used for evaluating management effectiveness. Decrement of this criterion serves as an alert to companiesto warn the performance of managementin growing the company's valueis not appropriate. By a review on research literature in examining the effect of leverage on returns, the following hypotheses have been considered.

- There is a significant relationship between debts to total assets and shareholders return

Although, capital structure decisions have been intensively debated in academic area but for lack of an accurate theoretical model to reveal cognitive behavior, few studies into CEO decision making have been provided. According to upper echelon theory, Hambrick and Mason (1984), the strategic vision and organizational direction followed by CEO is affected by the manager's understanding from environment. In this theory, it is stated that the tendency of CEO is a function of his/her experiences, educational background, functional background and in generally demographic characteristics have an effective role in understanding and his/her mental tendency toward decision making process. In this position according to Hambrick and Mason (1984), the factors formed notions of a top manager, it is supposed to have been oriented by his/her educational background, age, experiences and tendencies to the world.

Moreover, the resources for the firm include individual and group resources. The group resources include organizational resources, physical resources and human resources (Barney, 1991). The human resources categories include education and experience (Barney, 1991). The conceptual framework within resource-based theory regards CEOs as a human resources for having experience and education to drive firm performance. Empirical evidence based on the resource-based view theory found that higher education of CEO is associated with sales growth and experience is associated with firm growth rate (Rajagopalan and Datta, 1996). Gottesman and Morey (2010) examine the relationship between the quality of CEO educational background and firm performance, using the Tobin's Q as a measure of the financial performance of a firm. Their findings show that education background of CEO is not related to firm financial performance. Bhagat found that education does not play a role in replacing a poorly performing CEO as they replace without due consideration of their education background. Their conclusion was that CEO education does not reflect ability.

Zwiebel (1996) states the autonomy of manager is an inevitable fact in strategy of leveraging. Matemilola *et al.* (2013) in a study titled "the effect of leverage and managerial skills on shareholders return", use fixed effects panel and regression analysis for computing managerial skills effect. The results show that managerial skills have a significant and positive relationship with stock returns. Xiaowei and Zhang (2010) employ high level of CEO education as a measure to indicate a high capacity to process information and flexibility to openness, innovation and development of strategic decisions. They found out that managers' educational level had a positive effect on firm operation and market performance. Therefore, regarding to above mentioned result, the following hypothesis has been considered.

- There is a significant relationship between CEO education level and shareholders return

In many literature, the level of education has been considered as a proxy for managerial skills. The potential importance of education in the specific context of managers is further evidenced by the top managers with higher education level have more self-confidence for making strategic decisions because they are in a better position for analyzing their strategic choices (Matemilola *et al.*, 2013). So, it can be said that CEO have higher risk-taking because they are able to analyze better the expected risk and the result of their strategic decisions.

## MATERIALS AND METHODS

In this research for analyzing hypotheses, company's cross-sectional data and also time-series data derived from financial statements and activity reports of board of directors. From 454 companies which have been active on the Tehran Stock Exchange since 2008, on the basis of the company's data be available and in the course of the study fiscal year has not been altered, the sample shrank to 158 companies from the remaining companies a sample of 100 companies is randomly selected and analyzed. Statistical population were investigated for a 6 years period since March, i.e., a total of 600 observations are tested for examination of hypothesis from 2008-2013.

### Variables

**Shareholders return:** The return on equity is a result of the efficiency of all commercial, operational and financial activity of the enterprise. It demonstrates a company's ability to generate profits from shareholders' equity. This rate of profitability is computed by dividing the net income after interest and tax by average shareholders' equity.

**Leverage:** This measure describes how the firm's total asset is being financed. Ho and Hsu (2010) found a positive relationship between firm performance measured by ROE and firm leverage. They argue that leverage can improve firm performance given that the firm's management would be obliged to make crucial decisions which results in maximizing returns.

**Education level:** Rakhmayil and Yuce (2011) state that higher education level is significantly positive related to firm financial leveraging. Therefore, CEOs with higher education will be more capable to maximize the shareholder wealth. Cognition abilities of CEO for strategic decisions are measured based on education levels. We use triple scale of:

- Bachelor's degree and lower
- Master's degree and
- PhD for measuring education level of CEOs

**Price to book value (P/B):** One of the most important indices of investors is market price rate to book value. P/E ratio indicates future growth in earnings which is positively related to the expected future return on equity and negatively related to current return on equity because P/B reflects future profitability it is nominated as the appropriate indicator of earnings growth (Penman, 1996). This rate is calculated via dividing daily share price to book value per share; it is also, known as market-to-book ratio.

**Size:** Financial theory suggests that larger firms are more diversified and less prone to bankruptcy have better access to credit markets and hence tend to incorporate more debt in their capital structures (Rajan and Zingales, 1995). In this study, concept of size is log of total assets of company in year.

**Tax:** The effective tax rate as one of the most important indices for tax function has wide applications in economic decisions and policy-makings. This rate is equal to tax liability on taxable income multiplied by 100.

Return is as a driving power which makes motivation and is as a reward for investors. In this work first we examine the effect of leverage on return and then add CEO education level factor to model to test whether education level can be a significant variable for shareholders return. According to the second Modigliani and Miller model for computing return; we establish the following regression models for examining shareholders return:

$$SR_{it} = \beta_1 + \beta_2 LEV_{it} + \beta_3 PB_{it} + \beta_4 tax + \beta_5 Size_{it} + \varepsilon_{it} \quad (1)$$

$$SR_i = \beta_1 + \beta_2 EduLevel_i + \beta_3 LEV_i + \beta_4 PB_i + \beta_5 tax + \beta_6 Size_i + \varepsilon_{it} \quad (2)$$

Where:

$LEV_{it}$ = Total debt for the i firm and t time
$SIZE_{it}$ = Size for the i firm and t time
$PB_{it}$ = Price to book ratio for the i firm and t time
tax = Tax rate of the i firm and t time
$EduLevel_i$ = CEO education level of the i firm
$\varepsilon_{it}$ = Error term

## RESULTS AND DISCUSSION

The first step in statistical analysis is determining summarized characteristics of data and calculating descriptive indices. Table 1 provides descriptive statistics of research variables. Mean is the most commonly used measure of central tendency shows distribution equilibrium point. The amount of this parameter for debt is 0.55 and for return on equity is 12.15 also the mean of price to book ratio is 0.81.

**Normality test:** For examining the normality of dependent variable distribution, Jarque-Bera test has been used. This test performs for dependent variable and its result indicate lack of normality in variable distribution. In this case, non-normality of dependent variable is normalized through Johnson transformations using features of Minitab Software. After implementing transformations, the results of Jarque-Bera test are as follows (Fig. 1 and Table 2). Since, the significant level is >0.05; so, dependent variable follows normal distribution.

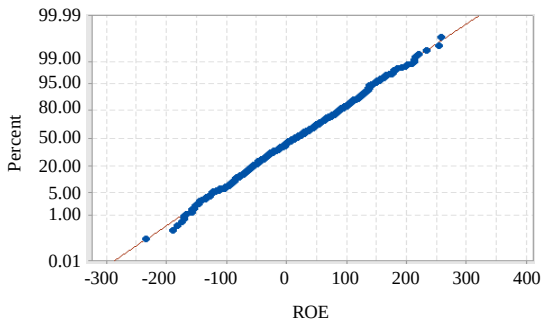


Fig. 1: Normal probability plot of transformed data

Table 1: Statistical properties of test and control variables

| Variables | Tax | ROE | LEV | Size | PB |
|---|---|---|---|---|---|
| Mean | 42215.40 | 12.15106 | 0.556327 | 4.262614 | 0.813575 |
| Median | 1857.000 | 3.206850 | 0.668718 | 4.722871 | 0.422277 |
| Maximum | 2023162 | 1806.371 | 2.262576 | 7.070585 | 3.021535 |
| Minimum | 811.000 | 0.371040 | 0.031620 | 1.612510 | 0.000000 |
| Std. Dev. | 200543.6 | 109.2504 | 0.318034 | 1.941713 | 0.797759 |
| Skewness | 8.569146 | 12.34277 | 0.139809 | 1.923661 | 1.052515 |
| Kurtosis | 96.00089 | 160.7523 | 5.105209 | 5.766963 | 9.25284 |
| Jarque-Bera | 244066.3 | 1012124 | 123.0880 | 618.2916 | 1492.176 |
| Probability | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| Observations | 600 | 600 | 600 | 600 | 600 |

**Stationary and unit root testing:** One of the ways for preventing from spurious regression is ensuring from data static; hence, before estimating model, statistical specifications of panel data have been examined in terms of stationary or having unit root. For examining stationary, Im, Pesaran and Shin test has been used. One commonly used test for unit roots is the Dickey-Fuller test that has been employed for testing stationary of variables. The results of this test inserted on Table 3.

Regarding to the results of IPS test, since, the amounts of all variables are less than 0.05; so, variables areat stable level during the research.

For examining linear relationship between dependent and independent variables and significant level of all regression model, F-Fisher test has been used for hypotheses which regarding to obtained significant level is less than error of 5%; so, significant level of regression models is confirmed. The presence of autocorrelation between regressionresiduals has been tested by Durbin-Watson test, the amounts of Durbin-Watson statistics for regression models 1 and 2 of research hypotheses are equal to 2.07 and 2.44, respectively. Therefore, the hypothesis based on absence of serial or autocorrelation between the errors in two models has been confirmed. F-Limer test is performed for testing similarity of intercepts and determining consolidated data or panel data which considering to the significant level, panel data of hypothesis has been confirmed. The significant level of Hausman test in two models shows that the difference between intercepts of different points is not randomly; so, fixed effects model accepted. Table 4 and 5 show the resultsof regression analysis for models 1 and 2.

$R^2$ (adjusted) of the estimated model is 42%; so, it can be resulted thatonly 42% of shareholders return of studied companies are explained by dependent and control variables. Findings resulted from data analyzing show debt ratio are statistically significant at 5%. Therefore, the null hypothesis, based on non-significant relationship between debt ratioandreturn of equity in Tehran Stock Exchange's listed companies is rejected and

Table 2: Dependent variable after Johnson transformations

| Variables | ROE |
|---|---|
| Observation | 600.000 |
| **Normal parameters** | |
| Mean | 14.160 |
| St. Dev. | 62.290 |
| Jarque-Bera | 1.470 |
| p-value (sig) | 0.083 |

Table 3: Im, Pesaran and Shin Panel Unit Root test

| Variables | Edulevel | Tax | PB | Size | LEV | ROE |
|---|---|---|---|---|---|---|
| W-stat | -15.250 | -10.970 | -11.020 | -8.260 | -6.250 | -15.290 |
| p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Table 4: The effect of the independent variables on the dependent using the model 1

| Variables | Coefficient | Std. error | t-statistic | Prob. |
|---|---|---|---|---|
| LEV | 4.84769 | 1.964879 | 2.467170 | 0.0154 |
| PB | -2.63E-07 | 1.97E-07 | -1.335020 | 0.1851 |
| TAX | -1.91E-06 | 4.00E-06 | -0.477200 | 0.6343 |
| SIZE | 1.068441 | 0.312741 | 3.416374 | 0.0009 |

Weighted statistics: $R^2$ = 0.580369; Mean dependent var. = 4.819787; Adjusted $R^2$ = 0.425768; SD dependent var. = 4.827783; SE of regression = 3.658401; Sum squared resid. = 1271.470; F-statistic = 3.753985; Durbin-Watson stat. = 2.073460; Prob. (F-statistic) = 0.000000

Table 5: The effect of the independent variables on the dependent using the model 2

| Variables | Coefficient | Std. error | t-statistic | Prob. |
|---|---|---|---|---|
| Edulevel | 0.497391 | 0.504562 | 0.985787 | 0.3267 |
| LEV | 4.890142 | 1.911349 | 2.558477 | 0.0120 |
| PB | -2.59E-07 | 1.94E-07 | -1.332060 | 0.1859 |
| Tax | -2.61E-06 | 3.93E-06 | -0.663958 | 0.5083 |
| Size | 1.098114 | 0.301006 | 3.648142 | 0.0004 |
| C | -3.164307 | 1.842296 | -1.717589 | 0.0890 |

Weighted statistics: $R^2$ = 0.578879; Mean dependent var. = 4.819787; Adjusted $R^2$ = 0.441371; SD dependent var. = 4.827783; SE of regression = 3.608358; Sum squared resid. = 1275.984; F-statistic = 4.209762; Durbin-Watson stat. = 2.446783; Prob. (F-statistic) = 0.000000

the main hypothesis is confirmed and for positivity sign of coefficient of independent variable, this relationship is direct.

Regarding to the resulted findings in Table 5 in 2nd model including CEO specific characteristic, there is not a significant relationship between education level of CEO and shareholders return. $R^2$ (adjusted) is 44% which indicates that the estimated model explain 44% of dependent variable. Moreover, the fixed effect panel and calculated sectional regression for CEO education level shows that size of firms has a positive relation withshareholders return. Empirical studies, also, confirms this subject that large-size companies are more stable and have less risk.

## CONCLUSION

In this study, resource-based view theory and upper echelon theory have been used for examining the effect of leverage and CEO education level on shareholders' returns. We apply a fixed effects model because it represents a technique for controlling invisible factors such as CEO specific characteristics which can affect examination of shareholders' returns. Regarding to the results of model estimation, there is a significant and positive relationship between debt rate and shareholders return which are similar to the results by Matemilola *et al.* (2013) researches. Moreover, the results of this research show that size as a control variable has the expected sign (positive sign) and can be a potential determinative factor on shareholders return in firms.

In this research, education level of CEOs erves as a criterion for measuring cognitive ability of CEO in understanding the business environment. Empirical results support the research finding where CEO with high education level does not perform differently from those CEO with a lower education level. The findings resulted from this research is consistent with findings by Gottesman and Morey (2010) based on non-significant relationship between education background of CEOs and firm performance. Also, the results are consistent with Gottesman and Morey (2010) observations based on non-significant effect of education background and education level on firm performance. They state that there are no observations based on better performance of CEO with master's degree than those with bachelor's degree. So, although CEOs can have especial educational skills, these skills should be defined again for responding to environmental challenges. As Bhagat *et al.* (2010), education level has effect on selecting CEOs but this criterion is not effective on long-term performance of company. This means that the effect of educational background gradually will be faded away over time.

This study tests the relationship between CEO education level and shareholders return within Iranian companies that are listed on Tehran Stock Exchange only. Therefore, the results could not be generalized on all the population of the other companies. One of the limitations of this study is that we only focus on CEO education level as a dimension of the cognitive ability of CEO while the education major chosen by CEOs can influence the domain that they are familiar with it.

In order to do future researches in relation to this research, the following subjects are suggested: for future research the role of top management team's potency for strategic decision making and board characteristics attributes can be conducted to find out whether top management teams enhance decision effectiveness and firm performance one possible recommendation for future research is to examining firms in different industries or activities for the same period of time in order to be able to compare the results in this research, CEO cognitive ability has been examined based on one of individual-social characteristics of CEOs. It is suggested that in future researches some other attributes such as gender, CEO tenure, years of experience, field of study have been taken into account.

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