Investigating the Association between capital structure and financial performance of companies listed in Tehran stock exchange (TSE)

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Abstract: Capital structure of companies has a decisive role in investment decisions an thus, in financial performance of companies. The purpose of this study is to investigate the relationship between capital structure and financial performance of companies listed in Tehran stock Exchange. The statistical population of the present study consists of 380 companies listed on Tehran stock Exchange for a 11-year time period (2001-2013). To test the hypotheses, the pooled data regression method was used. F and T statistics were used to test the significance of patterns. Results indicate that the variable Roc (return on capital) is negatively and significantly associated with DCE. However, it has a positive significant relationship with SDCE. The variable ROA has a negative significant relationship with DA. There is no significant relationship between the variables capital structure and EPS. Furthermore, we found no relationship between other variables of capital structure and financial performance. **[**gholamreza Espireh, Alireza Dadgarnejad, Alireza JerJerzadeh. **Investigating the Association between capital structure and financial performance of companies listed in Tehran stock exchange (TSE).** *Nat Sci* 2013;11(11):149-154]. (ISSN: 1545-0740). http://www.sciencepub.net/nature. 21

Key words: capital structure, financial performance, return on Assets(ROA0, return on capital (ROC), Tehran stock Exchange.

Introduction:

Among the duties of financial managers are trying to increase the value of their business unit, funding, timely investment in profitable projects, and optimal allocation of existing resources. In fact, in this competitive world, the company's manager should make the best decision through examining and evaluating different investment projects. Suppose that the management first of all evaluates different existing projects and then chooses the best one. Now it should supply financial resources required for the investment using one of the various funding methods. Each single decision made by the management can affect the firm's capital structure. On the other hand, investors while making investment decisions consider different factors. But according to many financial management experts, the company's financial performance indicators are significant factors affecting the investor's decisions. Therefore, it is very important for both the investor and the companies and financial managers to determine factors affecting the performance of the firm.

Definitions related to capital structure: capital structure refers to the company's financial framework including debts and equities. Which are used to finance the company.Capital structure financially means a solution adopted by a company to supply its assets through combining equities, debts, or hybrid securities (saad,2010). understanding capital structure is necessary, because it shows how a company could finance the funds needed for its current operations and growth.

Theories About capital structure

1- Modigliani –miller(MM) theory: until 1958, there was not a firm and clear theory associated with capital structure. In 1958m Modigliani and miller in their important and influential article proposed new discussions about capital structure. they started that including more debts in capital structure could not increase the firm's value, because benefits from cheaper debt are neutralized by increased risk of stocks. Hence, Modigliani and miller believe that in a world without taxes, the value of a company and its weighted average cost of capital would not be affected by capital structure (Bringham,2002).

2- Static trade-off theory :according to this theory, the optimal debt ratio of a company is supplied based on the trade-off of and benefits of costs and benefits of borrowing. in other words, in the framework of this theory, a company tries to make a balance between the value of interest tax savings and various costs of bankruptcy. however, there is still debate regarding how valuable are tax savings and which costs associated with financial issues are of importance. According toi this theory, a company should substitute debt with stock and vice versa, and also set the debt ratio so that the company's value is maximized.3-pecking order theory: According to this

theory, companies prefer internal financing to external financing, and if bounds are issued, they prefer bonds ensuring debt to stocks. In the theory, there is no clear combination of debt-capital, since there are two kinds of capital, that is, internal and external one which is at the top of pecking order, and the other at the end of it. Observed debt ratio of any company reflects its total need for external financing. (javedan zadeh, 2009).

literature review: foreign studies: early studies on capital structure were conducted by david Durand (1952), and following him, a study was done by Modigliani and miller (1985) in a modern and scientific way. these two for the first time in an article entitled "capital cost, financing, and investment theory" and using data from 43 electric companies and 42 oil companies for the year 1947, 1948, 1952, and 1953 stated that supposing the market is efficient, capital structure is not considered an effective factor in determining the value of a company, and they extend the issue of capital structure through presenting a theory in this regard. Raghu ran G.Rajan &luigi zingales (1995) in an article entitled "what do we know about capital structure", using international data in the industrialized world (G7) attempted to fill the existing gaps in those days knowledge. The study was performed for the time period (1991-1987) and using data from 4554 non-financial companies belonged to 7 industrialized countries in the world (including the united states, japan France, Germany, England, Canada, and Italy). Results showed that firstly, England and Germany has the lowest leverage among (G7) countries. Secondly, among these nations, the united states, England, and Canada have used less foreign financing and they have referred wore to domestic financial resources. Hovakimian, A.,Opler,T., titman, s(2001) used multiple regression to explain the leverage of the companies, and they concluded that the target debt ratio may change over time following changes in stock price and profitability of a company. lucas, Deborah J,.& McDonald, Robert l (1990), baker, M., wugler,j(2001), welch, Ivo (2004) have shown that current capital structure is highly associated with historical market value. Majumdar&chibber (1999) in article entitled "capital structure and performance". Investigated the relationship between debt levels in capital structure and performance of Indian companies. The sample consisted of 1000 companies listed on Mumbai stock exchange (BSE) for a 7-year time period (1988-1994). Results Indicated that variables size, liquidity, and advertising cost ratio to total operating costs have a positive significant relationship with performance. In general, given that financial sectors in India almost entirely belong to the government, a negative relationship was found between capital structure and performance. Fama and French (1998) did a study entitled "tax,financing decisions, and the company's value ". they used sectional regression to investigate the relationship between the company's value and dividends and debts. The sample consisted of 28 companies during (1965-1992) in the united states. they concluded that debt would never lead to tax benefits. Ahmad, Abdullah, & Roslan (2012) in an article entitled "the Impact of capital structure on performance of companies" examined the impact of capital structure on performance of companies listed on Malaysia stock exchange. results showed that (ROA) has a positive significant association with the variables (SGROW), (AGROW), and efficiency (EFF), while return on equities (ROE) has a negative significant relationship with short-term debt(STD) and total debt(TD).Rao,N.V,Al-yahyaee,K.H.M and seyed, L.A.M (2007) found a negative significant association between financial leverage and performance of companies. Their more research showed that liquidity, age, and stability of capital have a considerable effect on performance of companies. Furthermore, results of studies by Kester, c.w, 1986, Friend, I. And Lang,H.P,1988, Titman, s & weasels, R,1988 showed that financial leverage is negatively associated with profitability. In contrast with these studies, long, M.s. and I.B. maltiz(1985), and wald,J(1999) showed that financial leverage of companies is positively associated with profitability of companies. Shubita & Alsawalhah (2012) in an article entitled "the association between capital structure and profitability" investigated the impact of capital structure on profitability of firms listed on Amman stock Exchange (ASE) in Jordan. The sample consisted of 39 companies listed on Amman stock Exchange for a six-year time period (2004-2009).results indicated that there is a negative relationship between capital structure (long-term debt to asset (LDAit), and short-term debt to total assets (SDAit) and profitability (or return earnings).

Domestic stuies: jahankhani & yazdani(1995) in their study entitled "the Impact of type of Industry, Firm's size, commercial risk, and degree of operating leverage on the use of financial leverage in companies listed on the use of financial leverage in companies listed on Tehran stock Exchange" Examined the impact of internal factors, or in other words, operating characteristics of companies on determining their capital structure. For hypothesis testing, they used time series and sectional data integration technique and multivariate regression. They concluded that type of industry is effective on financial structure. However, the variables "Firm's size, commercial rick, and operating leverage would not affect financial structure. Saeid bagherzadeh (2003) in his article investigated main factors affecting capital structure of companies listed on Tehran stock Exchange (TSE).

Results showed that there is a positive significant relationship between Explanatory variables (profitability (EBit), tangible fixed assets (TANG), sales volume (LNS) and (financial leverage) debt ratio. Namazi & Heshmati (2007) in an article investigated the impact of effective factors and delayed data on changes in financial leverage of companies. Results show that there is a positive significant association between capital structure (financial leverage based on market value) and the variables profitability and fiscal deficit. Kimiagari & Einali (2008) examined factors affecting capital structure. The sample consisted of 78 companies listed on (TSE) during 2001-2006. Results indicated that profitability is among factors affecting capital structure and it has a negative significant association with capital structure. Arbabian & safari (2009) investigated the association between the the criteria of capital structure and profitability of companies through fitting multivariate regression models with panel data. Results shows that there is a positive relationship between (STD) ratio to asset and profitability of a company, as well as TD ratio to asset and profitability, however, there is a negative association between long term debt to asset and profitability. Masoud nadem

ET all (2011) found a positive significant relationship between capital structure and the variables ROI, size, TANG. However, they didn't find a significant association between capital structure and the variables PROF and NWA. In general, results of the investigated studies lie in 3 groups: Group one: in their studies, they concluded that capital structure and performance of the company are negatively associated. People included in this group are Raghuran G.Rajan & luigi zingales(1995), majumder&chibber(1997), Huang & song (2006), Ebur(2007), anolapo & kajola (2010), soumadi & hayajneh(2011), Gupta, srivastava, and sharma (2011), Muhammad umar Et al (2012), Rao, N.V, Al-yahyaee, K.H.M and syed (2007), farhad shahveisi Et all (2011).

Group two: in their studies, they found that there is a positive relationship between capital structure and performance of a company. Nour Abu-Rub (2012) belongs to this group.

Group three: in their studies, they concluded that either there is no association between capital structure and performance of a company or there is a weak association between them. Berger and Bonaccorsi (2006), Ebaid (2009), Iorpev, luper & Kwanum. Isacc (2012), sajadi et al (2010), and Nikbakht & Moghimi (2011) belong to this group.

Literature Methodology: all scientific studies are classified according to two bases of purpose and nature, and method. purpose-based studies are in turn classified into three groups including fundamental, applied, and practical research. more, based on nature and method, scientific research can be categorized in 5 groups including historical, descriptive, correlative, scientific, and experimental categories. According to the above mentioned classification, based on purpose, this is an applied research, and based on nature and method, this is a scientific and experimental research, because in the present research we have tried to help investors and other financial information users identify factors affecting capital structure and financial performance of the company and make economic decisions and correct investment through investigating the impact of capital structure factors on financial performance of the company.

Research hypotheses: the underlying hypothesis of this study is as follows: there is a significant relationship between capital structure and financial performance of selected companies listed on TSE (Tehran stock exchange). It includes the following hypotheses:

***Hypothesis (1):** there is a significant association between capital structure and ROA (return on asset)

***Hypothesis(2):** there is a significant association between capital structure and ROC(return on capital)

***Hypothesis(3):** there is a significant association between capital structure and ROE (return on equity)

***Hypothesis (4):** there is a significant association between capital structure and E PS (earnings per share)

Research statistical population and sample: statistical population of this study consists of companies listed in TSE. In the present study, in order to determine the statistical population, a specific relation was not used for estimating the sample size and for sampling, rather targeted elimination method has been used. In other words, those companies included in the statistical population having the following conditions were selected as the sample and other were eliminated:1- companies must keep their activity during the fiscal year. 2-companies must be among active companies in TSE. 3-companies must hot be investment companies or financial intermediation companies. 4-information required by the companies must be available. 5-Equity section in balance sheet must not be negative.thus, 380 companies were selected among companies listed on TSE for a 11-year time period (2001-2011) as the sample of this study.

Research variables: variables are a specific piece of data with different values

Variables	Variable name	Symbol
Capital structure (independent variables)	Debt to asset ratio	DA
	Short-term debt to asset ratio	SDA
	Long –term debt to asset ratio	LDA
Company's performance (Dependent variables)	Debt to common equity ratio	DCE
	Short-term debt to common equity ratio	SDCE
	Long-term debt to common equity ratio	LDCE
	Return on capital	ROC
	Return on equity	ROE
	Return on asset	ROA
	Earnings per share	EPS

Research model: in this study,given the type of data and the existing statistical analysis, sectional –time series statistical method (pooled data) has been used, since in order to investigate capital structure and financial performance of companies, independent and dependent variables are examined from two different aspects. On one hand, these variables are tested among different companies, and on the other hand, in the time period(2001-2011). To determine the regression, the following relations are used:

$$ROA_{i,t} = \alpha_0 + \alpha_1 DA_{i,t} + \alpha_2 SDA_{i,t} + \alpha_3 LDA_{i,t} + \alpha_4 DCE_{i,t} + \alpha_5 SDCE_{i,t} + \alpha_6 LDCE_{i,t} + \varepsilon_1$$

$$ROE_{i,t} = \beta_0 + \beta_1 DA_{i,t} + \beta_2 SDA_{i,t} + \beta_3 LDA_{i,t} + \beta_4 DCE_{i,t} + \beta_5 SDCE_{i,t} + \beta_6 LDCE_{i,t} + \varepsilon_2$$

$$ROC_{i,t} = \delta_0 + \delta_1 DA_{i,t} + \delta_2 SDA_{i,t} + \delta_3 LDA_{i,t} + \delta_4 DCE_{i,t} + \delta_5 SDCE_{i,t} + \delta_6 LDCE_{i,t} + \varepsilon_3$$

$$EPS_{i,t} = \gamma_0 + \gamma_1 DA_{i,t} + \gamma_2 SDA_{i,t} + \gamma_3 LDA_{i,t} + \gamma_4 DCE_{i,t} + \gamma_5 SDCE_{i,t} + \gamma_6 LDCE_{i,t} + \varepsilon_4$$

In which, ROC, ROE,ROA, and EPS are dependent variables and SDCE,SDA,LDA,DA,DCE, and LDCE are independent variables, and coefficients and γ *are intercepts, while* ε_i *is error value.* : δ_0 ، β_0، α_0

Hypothesis testing: to test the hypotheses, they were estimated using regression model and then using t and f statistics, significance of the regressions was examined. Finally, the hypotheses were answered according to statistical assumptions and results. For hypothesis testing, statistical methods including person's correlation coefficient, coefficient of determination, adjusted determination coefficient, and regression line equation have been used. To estimate the models, SPSS software was used

descriptive statistics: table (1): central indicators and dispersion of components of capital structure and financial performance of companies listed on Tehran stock exchange (TSE).

Table (1): central indicators and dispersion of components of capital structure and financial performance of companies listed on Tehran stock exchange (TSE):

descriptive indicators							Research components
Max	**min**	**Standard deviation)δ(**	**Median**	**mean) μ(**	**number) n(**	**Name**	
74.86	145.43-	126	10.16	12.17	4180	**ROA**	Return on asset
920	761.53-	105.28	49.14	78.93	4180	**ROC**	Return on capital
528.11	438.60-	44.83	29.8	34.44	4180	**ROE**	Return on common equity
8780	2997.0-	687.29	29.7	448.28	4180	**EPS**	Earnings per share
./99	/..4	./19	./65	./62	4180	**DA**	Debt to asset
./98	/..1	./19	./54	./53	4180	**SDA**	Short term debt to asset
./89	0	./1	/.5	/.9	4180	**LDA**	Long term debt to asset
18/55	0./..4	2.57	1.92	2.68	4180	**DCE**	Debt to common equity
9.81	0	./65	./18	./38	4180	**LDCE**	Long term debt to common equity
16.95	/..1	2.32	1.53	2.3	4180	**SDCE**	Short term debt to common equity

*source: calculation by the researcher based on the research obtained in the above table, we can conclude that in the capital structure section, companies in Iranian capital market have mostly used debts (especially short-term debts) to finance themselves and this indicates a high risk that the companies are faced with. Also, in terms of financial performance, companies in Iranian capital market in the above

mentioned time period had a low performance which result from various factors including inflection and financial crises existing in the majority of countries.

***Hypothesis testing:** to test the hypotheses, first we test the correlation between dependent and independent variables using Pearson correlation test, and then the results are analyzed. Next, the coefficients of multivariate linear regression equation are estimated through ordinary least square (OLS) method and the regression line equation is fitted.

***part one**: Pearson correlation test

Table (2): Pearson correlation between capital structure and financial performance of selected companies listed on Tehran stock exchange:

	DA	SDA	LDA	DCE	LDCE	SDCE
Pearson correlation coefficient significance level number(n) type of relation	-0/369** 0/000 4/80	-0/281** 0/000 4/80	-0/132** 0/000 4/80	-0/344** .0/000 4/80	-0/226** 0/000 4/80	-0/314** 0/000 4/80
(ROA)	negative	negative	negative	negative	negative	negative
Pearson correlation coefficient significance level number(n) type of relation	-/049** 0/003 4/80	0/012 .456 4180	-0/106 0/000 180	-0/050 0/003 4180	-0/127 0/000 4180	-0/017 0/307 4180
ROC)(	negative	No relation	negative	negative	negative	No relation
Pearson correlation coefficient significance level number(n) type of relation	0/042 0/011 4180	0/080 0/000 4180	-0/070 0/000 4180	-0/019 0/256 4180	-0/0103 0/000 4180	0/009 0/575 4180
ROE)(	positive	positive	negative	No relation	negative	No relation
Pearson correlation coefficient significance level number (n) type of relation	-/129 0/000 4180	-0/060 0/000 4180	-/116 0/000 4180	-/127 0/000 4180	-/147 0/000 4180	-/098 0/000 4180
EPS)(	negative	negative	negative	negative	negative	negative

*significance at 0/05 level
**significance at 0/01 level

Given the results observed in the above table, the correlation between the variables capital structure and financial performance in selected companies listed on Tehran stock exchange is mostly significant at 0/05 level. Since the value of correlation coefficient is negative we accept an indirect relationship. Given that correlation coefficient between the variables ROA and DA is the largest of all(-/1369), we may conclude that the association between these two variables is stronger than that of other variables. Also correlation coefficient between DA ratio and ROC is the least of all(-/049), and thus we can conclude that the relationship between these two variables is weaker than that of other variables.

***part two:** fitting regression line equation :in order to confirm or reject the hypotheses, the following are examined in the regression equation :1-

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10/22/2013