

Investigation of the relationship between capital structure and profitability of firms listed in Tehran stock exchange (TSE)

Gholamreza Espieh¹, hamid moridipour²

¹- Department of Accounting, Andimeshk Branch, Islamic Azad University, Andimeshk, Iran (corresponding author),

²-Department of Accounting, Andimeshk Branch, Islamic Azad University, Andimeshk, Iran

Abstract: the aim of this study is to investigate the impact of capital structure on profitability of firms listed in TSE. For this purpose a total of 131 firms were selected as the statistical sample. through fitting multivariate regression model with pooled data, the relationship between the criteria of corporate capital structure and profitability was investigated over a 7-year time period (2004-2010) for the sample firms. Results indicate that the variable ROA (return on asset) has a positive significant association with the variables LDC (long-term debt to capital) and DCE (debt to common Equity). however, it has a negative significant relationship with the variables DEMV and DA (debt to asset). The variable ROC (return on capital) has a positive significant relationship with the variable DC, however it has a negative significant association with the variable DEMV and DA. The variable ROE (return on Equities) has a positive significant relationship with the variable DA, however, it has a negative significant relationship with the variables DMEV and DCE. The association between all capital structure variables and the variable EPs (Earnings per share) is insignificant. Also, we found no association (relationship) between other variables of capital structure and profitability.

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Introduction:

The issue of capital structure has partly controversial areas in financing research, such that it is emphasized by a number of books and literature. The first historical article was published by Modigliani and Miller in 1958 that confirmed the lack of association between firm value and the capital structure combination (Margaritis, D. and M. Psillaki, 2007). They stated the theory of lack of association between capital structure and firm value. They believed that identification and valuation of companies based on assets and their way of financing are not dependent on capital structure identification. Referring to research and literature on financial management we observe that main reasons for the failure of companies are lack of or insufficient investment and inadequate or improper financing of companies. For example, owners of such firms may choose an inappropriate combination of resources (debt against capital), or they may obtain resource which entail high commitments and liquidity limits for them. Thus the existing weaknesses may lead to inappropriate investment which threaten the firm survival. In addition, inappropriate capital structure for any firm would affect all activity areas of a firm and could result in issues such as inefficiency in product marketing, ineffectiveness and inability in proper use of manpower, etc. financial experts believe that an increase in the degree of firm leverage, for example

increased debt ratio in corporate capital structure, would increase the value to some point. however, outside that point, further increase in the degree of firm leverage would increase total costs of a firm and thus, an increase in total market value. According to what we mentioned above and the importance of the issue, the present study seeks to investigate capital structure of Iranian firms and how it affects firm profitability.

Definitions associated with capital structure:

Capital structure of a firm explains the ways in which a firm finances its investment and operations. It mainly consists of a combination of debt and equity as well as other financing resources such as retained earnings, etc. which are available for the company. also, a combination of various sources of long-term funds and equities including reserves and surplus of a firm (Booth L, V. Aivazian, A. K. Demircia-kant, & Maksimovic, 2001). In short, capital structure is a combination of firm debt (short term and long term), common and preferred stock.

Literature review:

Foreign studies: first studies on capital structure were carried out by David Durand (1952) and following him, in a new and scientific way by Modigliani and Miller (1958). these two for the first time in their article entitled "capital cost, financing,

and investment", and using data from 43 electric companies and 42 oil companies for the years 1947, 1948, 1952, and 1953 stated that supposing the efficiency of market, capital structure is not an effective factor in determining firm value. They extended the issue of capital structure by presenting a theory in this regard. Fama and French (1998) carried out a study entitled "Tax, financing decisions, and firm value". They used sectional regression to examine the relationship of firm value with dividend and debt. The sample consisted of 28 firms over the year 1965-1992 in the United States. They concluded that debt never leads to achieving tax benefits, and they predicted a negative association between profitability and long-term debt (LTD) ratio. Hadlock and James (2002) carried out a study regarding how 500 American firms were financed during 1980-1993. They concluded that financing type choice of firms (debt or capital) is made essentially according to their stock valuation in the market. They also concluded that more profitable firms use debt as main source of financing, in other words, more profitable firms borrow more. Mesquite et al (2003) in their article in Brazil showed that the relationship of the variables short-term debt (STD) divided by total debt and equity divided by total debt with the variable return on equity (ROE) is positive and significant. Generally, they concluded that there is a negative significant relationship between profitability and degree of debt (capital structure) in Brazilian companies. Hovakimian, A., Opler, T., and Titman, S (2001) used multiple regression to illustrate the degree of firm leverage. They concluded that target debt ratio might change over time with changes in stock price and profitability of a firm. Lucas, Deborah J., & McDonald (1990), Baker, M., & Wurgler, J (2002), and Welch, IVO (2004) have shown that current capital structure is highly associated with historical market value. Richard H. Fosberg, and Arvin Ghosh (2006) in an article entitled "capital structure and profitability of NYSE & AMEX companies", investigated the impact of capital structure on firm performance. For member companies of NYSE, a negative association was found between corporate profitability and debt (capital structure). However, no relationship was found between profitability and capital structure in member companies of AMEX. Ebor (2007) investigated the relationship between capital structure and performance of small and middle-sized firms in South Africa and Ghana. The sample consisted of 160 firms listed in Ghana stock exchange (GSE) and 200 South African firms for a 6-year time period (1998-2003). They found out that profitability is negatively associated with the variable LTD ratio. Majumdar & Chibber (1997), and Roa, N.V., Al-Yayhaee, & Syed, L.A.M (2007) found a negative

significant relationship between firm financial leverage and performance. Their further research illustrated that liquidity, age, and capital stability have a considerable impact on corporate performance. Also, results of studies by Kester, C.W, 1986, Friend, I. & Lang, H.P, 1988, and Titman's & Wessels, R (1988) showed that financial leverage is negatively associated with profitability. However, in contrast with these studies, Long, M.S & I.B Maltz (1985), and Wold, J (1999) showed that financial leverage of firms has a positive relationship with their profitability. Chen Yang, Fei Lee, Xiang, and Wen Lee (2010) found out that there is a positive relationship between firm size and debt level. Also, they discovered a negative relationship between firm size and stock returns. San and Heng (2011) in an article entitled, "the impact of capital structure on corporate performance in Malaysia", investigated the association between capital structure and firm performance prior to and during the crisis (2007). In general, results indicate that there is a relationship between capital structure and firm performance prior to and during the crisis (2007). In general, results indicate that there is a relationship between capital structure and firm performance in the selected proxy. Muhammad Umar et al (2012) in an article entitled "the impact of capital structure on corporate financial performance in Pakistan", investigated the relationship between capital structure and financial performance of 100 firms listed in Karachi stock exchange (KSE) for a 4-year time period, beginning in 2006 and ending in 2009. In their research, they used ordinary least square (OLS) regression to examine the relationship. Carrying out this study, they reached the general conclusion that capital structure is among important and effective factors on corporate financial performance, and they are negatively associated.

Domestic studies:

Namazi and Shirzadeh (2005), in their study concluded that generally there is a positive relationship between capital structure and ROE (profitability of companies, however, this relationship is statistically weak. Sinaei and Rezaian (2007) carried out their study entitled, "investigating the impact of firm characteristics on capital structure (financial leverage)". This study has attempted to investigate the issue by focusing on financial performance of 124 public companies listed in TSE during (1999-2004). They concluded that among the variables examined, firm size and opportunities for growth have a more effective role in determining capital structure. Mehrani and Rasaian (2007), in their study investigated the relationship between capital structure as a dependent variable, and different ratios of profitability as the independent variable. They

concluded that there is a negative significant relationship between the variable capital structure (total debts to total assets ratio) and the variables profitability (ROA rate, net profit to sales profit, pre-tax profit to gross profit). kimiagari and Einali (2008) investigated factors affecting capital structure. the sample consisted of 78 firms listed in TSE in the time period (2001-2006). Results indicated that profitability is one of the effective factors on capital structure and has a negative significant relationship with it. Arbabian and safari (2009) conducted a study entitled, "An investigation of the impact of capital structure on profitability of firm listed in TSE". For this purpose, they selected a total of 100 firms listed in TSE from 13 different industries for the time period (2002-2008). they examined the relationship between the criteria of capital structure and firm profitability through fitting multivariate regression models with panel data. results indicate that there is a positive relationship between STD to firm asset and profitability ratio, also between total debt to asset ratio and profitability. but LTD (long-term debt) to asset and profitability are negatively associated. Zeinali and shilan (2011) in their study concluded that there is a negative significant relationship between capital structure and firm size. On the other hand, there is no significant relationship between financial structure and return on investment rate EPS (earnings per share). Mojgan derayat(2011) carried out a study entitled, "An Empirical investigation of the association between capital structure and profitability in firms listed in TSE". The selected sample consisted of 135 firms for a 5-year period (2006-2010). Results showed that there is a positive significant relationship between capital structure variables (CLT, NCE,and ETL) and ROA (profitability). In general, results of the investigated studies lie within 3 groups: group one: in their research concluded that there is a negative relationship between capital structure and profitability. People included in this group are Fama & French (1998), booth et al (2001), mesquite et al (2003), Hakan Karabacak et al (2004),shubita & Alsawalhah (2012), Kester (1986), Friend & lang (1988), titman & wessels (1988), Mehrani & Rasaian (2007), Kordestani & Najafi omran (2008), and Kimiagari & Einali (2008).

Group two: through their studies, they concluded that there is a positive relationship between capital structure and firm profitability. Hadlock & James (2002), long,M.S& I.B. Maltiz (1985), Wald,j (1999), and mojgan derayat (2011) belong to this group.

Group three: in their studies, the concluded that either there is no relationship between capital

structure and profitability, or there is a weak association. H.fosberg & Arvin ghosh (2006), delavari(1998), and namazi & shirzadeh (2005) belong to this group.

Research methodology:

All scientific research are classified based on two bases including purpose, and nature and method. Purpose-based research is in turn divided into three groups of fundamental, applied, and practical research. Also based on nature and method, scientific research can be put into 5 groups including historical, descriptive, correlative, casual, and empirical. According to the above classification, based on purpose, this is an applied research, and based on nature and method, it is a casual and empirical research, since in the present study, we have attempted to help investors and other financial information users to identify factors affecting capital structure and firm profitability and,make sound economic and investing decisions through investigating the impact of capital structure factors on profitability.

*research hypotheses: the underlying hypothesis of this study is as follows:there is a significant relationship between capital structure and profitability of selected firms listed in TSE. it consists of the following hypotheses: hypothesis (1) there is a significant relationship between capital structure and return on asset (ROA). Hypothesis (2): there is a significant relationship between capital structure and return on capital (ROC).

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

Hypothesis (4): there is a significant relationship between capital structure and earnings per share (EPS).

*research statistical population and sample: statistical population of this study consists of firms listed in TSE. In the present study for determining the statistical sample, no specific relation was used to estimate sample size and sampling, rather targeted exclusion method was used. In other words, those companies in the population which had the following qualifications, were selected as the sample and all. Other were excluded: 1- firms must keep their activity during the fiscal year. 2- firms be among active companies in TSE. 3-firms must not be among investment and financial intermediation companies. 4- Availability of information needed

5- Equity section in balance sheet must not be negative. 6-their fiscal year must end in 29 Esfand (Persian calendar).thus, a total of 131 firms were selected among firms listed in TSE as the sample for a 7-year time period (2004-2010).

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

Variables	Variable name	Symbol
Capital structure (independent variables)	Long-term debt to capital ratio	LDC
	Debt to capital ratio	DC
	Debt to asset ratio	DA
	Debt to equity market value	DEMV
	Debt to common equity ratio	DCE
	Long-term debt to common equity	LDCE
Firm profitability (dependent variables)	Return on capital	ROC
	Return on equity	ROE
	Return on asset	ROA
	Earning per share	EPC

Research model: in our study, given the type of data and the existing statistical analysis methods, sectional-time series statistical methods(pooled data) are used, since in order to examine the relationship between capital structure and firm profitability, independent and dependent variables are investigated from two different aspects. These variables are investigated from two different aspects. These variables are tested among different firms on one hand, and they are tested in the time period (2004-2010), on the other hand. To determine the regression, the following relations are used:

$$ROA_{i,t} = \alpha_0 + \alpha_1 DA_{i,t} + \alpha_2 SDA_{i,t} + \alpha_3 LDA_{i,t} + \alpha_4 DCE_{i,t} + \alpha_5 SDCE_{i,t} + \alpha_6 LDCE_{i,t} + \epsilon_1$$

$$ROE_{i,t} = \beta_0 + \beta_1 DA_{i,t} + \beta_2 SDA_{i,t} + \beta_3 LDA_{i,t} + \beta_4 DCE_{i,t} + \beta_5 SDCE_{i,t} + \beta_6 LDCE_{i,t} + \epsilon_2$$

$$ROC_{i,t} = \delta_0 + \delta_1 DA_{i,t} + \delta_2 SDA_{i,t} + \delta_3 LDA_{i,t} + \delta_4 DCE_{i,t} + \delta_5 SDCE_{i,t} + \delta_6 LDCE_{i,t} + \epsilon_3$$

$$EPS_{i,t} = \gamma_0 + \gamma_1 DA_{i,t} + \gamma_2 SDA_{i,t} + \gamma_3 LDA_{i,t} + \gamma_4 DCE_{i,t} + \gamma_5 SDCE_{i,t} + \gamma_6 LDCE_{i,t} + \epsilon_4$$

In which, ROC, ROA, and EPS are dependent variables and DC,DEMV,LDC,DA,DCE, and LDCE are independent variables, and the coefficients are intercepts, while (ϵ_i) is error value. $\delta_0, \beta_0, \alpha_0$ And γ_0

Hypothesis testing: in order to investigate the hypotheses using regression models, first the hypotheses were estimated and then using (F) and (T) tests, the significance of the regressions was examined. Finally the hypotheses are answered according to statistical assumptions and the obtained results. For hypothesis testing, statistical method including Pearson correlation coefficient, coefficient of determination, adjusted determination coefficient, and regression line equation have been used. To estimate the models, SPSS software has been used.

Descriptive statistics:

Table (1): Central indicators and dispersion of capital structure and profitability components of all firms listed in TSE*

	LDC	DC	DA	DEMV	DCE	LDCE
Pearson correlation coefficient	-.042	-.043	-.084	-.059	-.058	-.064
significance level number(n) type of relation	0/207 917	/151 917	/011 917	/075 917	/080 917	/054 917
(EPS)	No relation	No relation	negative	No relation	No relation	No relation
Pearson correlation coefficient	-.133**	-.273**	-.526**	-.444**	-.393**	-.225**
significance level number(n) type of relation	.000 917	.000 917	.000 917	.000 917	.000 917	.000 917
(ROA)	negative	negative	negative	negative	negative	negative
Pearson correlation coefficient	-.076*	-.098**	-.060	-.290**	-.207**	-.123**
significance level number(n) type of relation	.021 917	.003 917	.070 917	.000 917	.000 917	.000 917
	Negative	Negative	No relation	Negative	negative	Negative
Pearson correlation coefficient	-.008	.129**	-.271**	-.253**	-.222**	-.146**
significance level number(n) type of relation	.817 917	.000 917	.000 917	.000 917	.000 917	.000 917
	No relation	positive	negative	negative	negative	Negative

*significance (sig) at 0/05 level

**significance (sig) at 0/01 level

According to the result observed in the above table, the correlation between the variables capital structure and profitability in selected firms listed in TSE is mostly significant at the level of (0/05). Since the value of correlation coefficient is negative, we accept an indirect association. Given that correlation coefficient between the variables ROA and DA is the largest of all (-0/526), we can concluded that the relationship between these two variables is stronger than that of other variables. Also, the correlation coefficient between the variables LDC ratio and ROE is the smallest of all (-0/076). Thus we can conclude that the relationship between these two variables is weaker than that of other variables.

*port two: fitting regression line equation: to confirm or reject the hypotheses, the following cases are investigated in the regression equation:1- self-correlation 2-the value of adjusted coefficient of determination 3-significance of the model 4-significance of its coefficients.

Table (3): Multiple regression coefficient of capital structure and profitability of selected firms listed in TSE

Dependent variables												
EPS			ROE			ROC			ROA			
P	T	β	P	t	β	P	t	β	P	t	β	
000/0	904/4	944/573	027/0	208/2	134/0	0000/	13/231	1/213	0000/	893/22	346/0)CONSTANT(
810/0	241/0	014/0	112/0	590/1	087/0	663/0	4360/	022/0	0410/	050/2	098/0	LDC
879/0	152/0-	007/0-	471/0	720/0	031/0	/0000	75911/	469/0	1940/	301/1	049/0	DC
109/0	603/-1	081/0-	000/0	965/4	236/0	/0000	460/7-	330/0-	0000/	723/11-	486/0-	DA
682/0	410/-0	020/-0	000/0	482/-7	344/-0	/0000	272/8-	354/0-	0000/	383-8/	336/0-	DEM V
527/0	632/0	0370/	001/0	263/-3	182/-0	783/0	2761/	014/0	0050/	825/2	0/138	DCE
395/0	850/0-	048/0-	485/0	698/0-	037/0-	944/0	070/0-	03/0-	0/629	0/483-	0/022-	LDC E
002/0			113/0			2310/			3250/			R ² adjusted
4951/			8691/			6091/			9841/			Durbin-watson
311/1			362/20			939/46			429/74			Statistic (f)
249/0			000/0			0000/			0000/			Sig.level) P(

Analysis of ROA regression and capital structure: as shown in table(3) in table(3), according to the output of durbin-watson test (1/984) we can conclude that there is no self-correlation between the residuals. also, according to (F) statistic (74/429) and its significance level (0/000), we conclude that the regression equation is significant. Furthermore, given the results obtained from (T) statistic and significance Level (P) analysis in table(3), we can state that the relationship between the variable ROA and the capital structure variables (LDC and DCE) is positively significant. Also, the variables (DEM V_a and DA) are negatively significant. However, there is no significant association between the variable ROA and other capital structure variables. These findings are consistent with the results obtained by Rajan & zingales (1995), Glison & Mateor (2000), Hakan Karabacak et al (2004), Hang & song (2006), Abor (2007), zeitoon & Tian (2007), Onalaio & Kajola (2010), chen yang, Few lee, xinga, and Won lee (2010), Abdulghafur khan (2012), Muhammad umar et al (2012), Mehrani& Rasaian (2007), kordestani & Najafi Omran(2008), Mehrani et al (2008), sajadi et al (2010), Mahmoud Yahyazadeh et al (2010), Heidar mohammadzadeh et al (2010), Mahmoud Yahyazadeh far et al (2010), Arabzadeh & Maghaminejad (2011), and saeidi & Mahmoudi (2011), however they are inconsistent with the results obtained by Nour Abu-rub (2012), saeid bagherzadeh (2003), Namazi & Heshmati (2007), talebnia & Ravanshad (2010), san &

Heng (2011), and mohammad ali aghaei et al (2009). Thus, first hypothesis of this study is confirmed.

Analysis of ROC regression and capital structure: as shown in table(3) above, according to durbin-watson test (1/609), we can conclude that there is no self-correlation between the residuals. Also, according to (f) statistic (46/939) and its significance level (0/000) we conclude that the regression equation is significant. More, given the results of (t) statistic and significance level (p) in table (3),it can be concluded that the relationship between the variable ROC and the variable DC is positive and significant. Also, the relationship between the variable ROC and capital structure variables (DEM V and DA) is negatively significant. However, there is no significant association between the variable ROC and other capital structure variables. These findings are not consistent with the study results by san & Hang (2011), and Niresh & Volnampi(2012). Thus, second hypothesis is also confirmed.

Analysis of ROE regression and capital structure: as shown in table (3), according to durbin-watson test (1/698), we can conclude that there is no self-correlation between the residuals. Also, according to (f) statistic (20/362) and its significance level (0/000), we conclude that the regression equation is significant. Further, according to the results of (t) statistic and significance level (p) analysis in table (3), it can be concluded that the relationship between the variable ROE and capital structure variable (DA) is positively significant. Also, the relationship between the variable

ROE and capital structure variables (DEMV and DCE) is negatively significant. However, there is no significant relationship between the variable ROE and other capital structure variables. These findings are consistent with the results obtained by Abor(2005), Gil et al (2011), Nour Abu-rub (2012), Namazi & shirzadeh (2005), Arbabian & safari (2009), mohammad ali aghaei et al (2009), and talebnia & ravanshad (2010), however, they are in consistent with the results obtained by Nour Abu-Rub (2012), Heidar Mohammadzadeh et al (2010), san & Heng (2011), Nireesh & volnampi (2012), and Akbarpour & Aghabeigzadeh (2011). Thus, third hypothesis is also confirmed.

Analysis of EPS regression and capital structure: as shown in table(3) above, according to the output of durbn-watson (1/495) we can conclude that there is no self-correlation between the residuals. Also, according to (f) statistic (1/311) and its significance level (0/249), we conclude that the regression equation is not significant. Furthermore, given the results of (t) statistic and significance level (p) analysis in table (3), it can be stated that the relationship between the variable EPS and all capital structure variables is insignificant. These findings are consistent with the results obtained by san & Heng (2011), Heidar mohammadzadeh et al (2010), zeinali & shilan (2011), and nour Abu-rub (2012), however in consisted with the study results by saeidi & mahmoudi (2011), and Muhammad Umar et al (2012). thus, fourth hypothesis is rejected.

Discussion and conclusion:

The present study seeks to investigate the relationship between different financing methods (capital structure) and profitability of firms existing in Iranian capital market. Results of the descriptive statistics indicate that capital structure of firms existing in Iranian capital market is mainly dependent on debts. Also, profitability of these firms over the period of this study (2001-2011) has been rather weak. In addition, results of the inferential statistics indicate that the variable ROA is positively associated with the variables LDC and DCE. However, it has a negative significant relationship with the variables DEMV and DA. The variable ROC has a positive and significant relationship with DC. However, it has a negative significant relationship with DEMV and DA. The variable ROE has a positive significant relationship with the variables DEMV and DCE. Also the relationship between all capital structures variables and EPS IS insignificant. No association was found between other variables of caital structure and profitability. In general, by carrying out the present

study we concluded that there is a negative relationship between capital structure and profitability of firms existing in Iranian capital market. Also, according to the results observed from hypothesis testing. Except for fourth hypothesis (EPS), all other study hypotheses (first hypothesis (ROA), second hypothesis (ROE), and third hypothesis (ROC) were confirmed.

Suggestions:

1-GIVEN that we found a negative relationship between debt level and profitability in all firms listed in TSE, it is recommended that managers take action against uncontrolled decreases in using debts in corporate capital structure. 2- due to high degree of debts in firms and the resulting risk for them, we suggest that managers take action against uncontrolled decreases in using debts and using other financing sources in corporate capital structure. 3- it is recommended to separate public and private companies and to investigate the relationship between capital structure and profitability separately and in a comparative way. 4-we suggest that a comparative investigation of capital structure and profitability of Iranian firms and foreign firms be carried out.

Persian references:

- 1- Arbabian, ali Akbar & Mehdi safari Geraieli (2009),"An investigation of the impact of capital structure on profitability of firms listed in TSE", Journal of management Vision, Issue 33,PP 159-175
- 2- Zeinali, Mehdi, and mohamadshilan, Jamal (2011),"investigating the impact of capital structure on size, ROC rate and EPS of firms listed in TSE (A case study of pharmaceutical industry), journal of securities analysis financial knowledge, vol. (9), issue (9),PP 43-59.
- 3- sinaei, Hassan ali, and rezaeian, ali (2007)," investigating the impact of firm characteristics on capital structure (financial leverage)", journal of Humanities and social sciences, 5th year, issue 19,pp 89-109
- 4- kordestani, GHolamreza, and Mazaher najafi Omran (2008)", An investigation of capital structure determinants: An Empirical test of the static-trade off theory Against pecking order theory", journal of financial research, vol.(10), issue 25
- 5- kimiagari, ali mohammad, and Einali soudabeh (2008)", A presentation of a comprehensive capital structure (A case study of firms listed in TSE), journal of financial research, issue 25,P.P(91-108).
- 6- mehrani, sasan, and Amir rasaian (2007)", investigating the relationship between ratio of profitability and capital structure in TSE", journal of accounting studies, issue 18,summer 2007, PP 59-80.
- 7- Namazi, mohammad, and jalal, shirzadeh (2005)", investigating the relationship between capital structure and profitability of firms listed in TSE", journal of accounting and auditing reviews, 12th year, issue 42,pp 75-95.