CAPITAL STRUCTURE DETERMINANTS INSIDE MULTINATIONAL AND DOMESTIC COMPANIES, EVIDENCE FROM IRAN

DETERMINANTES DE LA ESTRUCTURA DE CAPITAL DENTRO DE LAS COMPAÑÍAS NACIONALES Y MULTINACIONALES, EVIDENCIA DE IRÁN

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Abstract: This study investigates the effects of multi-nationality of firms on capital structure. In addition, determining factors of capital structure of multinational companies and domestic companies listed in Tehran's stock exchange have been investigated. In this regard, a number of 712 firms with data belonging to 2008-2013 have been subjected to our analyses. In this research ratio of long-term debts to sum of long-term debts and market value of equity has been considered as the index of capital structure. In addition the t-test and the Mann-Whitney test have been incorporated for expression of the difference between averages of ratios of long-term debts of domestic and multinational companies. In order to determine the determinant factors of capital structure a set of variables including Profitability, growth opportunities, value of collateral assets, firm size, ratio of interest payments, non-tax debts, tax rates, foreign sales, business risk and cost of bankruptcy have been used as control variables of the study. Through application of the multivariate linear regression model, we have tried to provide a suitable model for both groups. Results have shown that the ratio of long-term debts in multinational firms is significantly lower than domestic firms. In addition, results of the OLS regression have shown that there exists a fundamental difference between capital structure determinants among domestic and multinational companies. For both groups profitability, growth opportunities, value of collateral assets and firm size were considered as meaningful determinant factors of capital structure. For domestic companies, the dividend payout was also found to be a significant determinant of capital structure. Furthermore, for a multinational company, non-tax debts, tax rates and exports (foreign sales) were found to be meaningful determinants of capital structure. Nevertheless, business risk and bankruptcy costs were not found to be meaningful determinants of capital structure for neither of MCs or DCs.
Keywords: capital structure, Leverage, dividend payout, multinational companies, domestic companies

Abstracto: Este estudio investiga los efectos de la multinacionalidad de las empresas en la estructura de capital. Además, se han investigado los factores determinantes de la estructura de capital de las empresas multinacionales y las empresas nacionales que cotizan en la bolsa de valores de Teherán. En este sentido, un número de 712 empresas con datos pertenecientes a 2008-2013 han sido sometidas a nuestros análisis. En esta investigación, la relación de las deudas a largo plazo con la suma de las deudas a largo plazo y el valor de mercado del capital se ha considerado como el índice de la estructura de capital. Además, la prueba t y la prueba de Mann-Whitney se han incorporado para expresar la diferencia entre los promedios de las relaciones de las deudas a largo plazo de las empresas nacionales y multinacionales. Para determinar los factores determinantes de la estructura de capital, un conjunto de variables que incluyen rentabilidad, oportunidades de crecimiento, valor de los activos colaterales, tamaño de la empresa, proporción de pagos de intereses, deudas no tributarias, tasas impositivas, ventas en el extranjero, riesgo comercial y costo de quiebra se han utilizado como variables de control del estudio. Mediante la aplicación del modelo de regresión lineal multivariable, hemos tratado de proporcionar un modelo adecuado para ambos grupos. Los resultados han demostrado que la proporción de deudas a largo plazo en empresas multinacionales es significativamente menor que la de las empresas nacionales. Además, los resultados de la regresión MCO han demostrado que existe una diferencia fundamental entre los determinantes de la estructura de capital entre las empresas nacionales y multinacionales. Para ambos grupos, la rentabilidad, las oportunidades de crecimiento, el valor de los activos colaterales y el tamaño de la empresa se consideraron factores determinantes significativos de la estructura del capital. Para las empresas nacionales, también se descubrió que el pago de dividendos era un determinante significativo de la estructura de capital. Además, para una empresa multinacional, las deudas no tributarias, las tasas impositivas y las exportaciones (ventas en el extranjero) resultaron determinantes significativos de la estructura del capital. Sin embargo, no se descubrió que los riesgos comerciales y los costos de bancarrota fueran determinantes significativos de la estructura de capital para ninguno de los MC o DC.
Palabras clave: estructura de capital, apalancamiento, pago de dividendos, empresas multinacionales, empresas nacionales

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Introduction

Following publication of well-known results of Miller and Modigliani [1], modern theories of capital structure was began. The results revealed that in efficient markets free from tax and bankruptcy costs, the ratio between a company's value and capital structure remains constant, then they extended and modified their theory and expressed that an optimized capital structure exists in real world and these structures maximize the value of firms. Obtaining and comprehending the determining factors of an optimal capital structure has crucial importance, because, identification of them is a way of maximizing the value of firms [2].

One of the interesting subjects for financial researchers is investigation of presence of firms in international scenes and multi-nationality of these companies and its effects on their executive processes and of course on their capital structure. However, only a few researches of this kind have been carried out in Iran and also fewer researches have been dedicated to comparison of determining factors of capital structure among domestic and multinational companies. In addition, increasing importance of global markets along global competitions has jointly increased the importance of determining factors of capital structure of such companies.

In addition, reviewing the theoretical foundations of capital structures leaves us with an unsolved mystery. On the other hand, financial theories forecast that MCs should have higher financial leverage compared to DCs. This higher leverage has several advantages such as lower risks, larger size, less cash flow fluctuations and increased access to international capital markets. On the other hand, in contrast to these forecasts, most performed studies and researches have shown that American MCs are equipped with a lower financial leverage compared to American DCs [3]. Different researchers have proposed several different reasons and explanations for solvation of this mystery, however still there are no general and unified views regarding the effects of becoming multinational on capital structure of companies.

Capital structure in MCs and related literature

Most models related to determining factors of capital structure of MCs, reveal that MCs should keep a higher debts as a result of more variability, easier access to international capital markets and obtaining a larger size[4]. In support, results of research carried out by Dukas & Pantzalis [5], Usha R. Mittoo and Zhu Zhang [6]; shows that MCs keep a higher level of debts compared to DCs. In contrast to this, other researchers have concluded that representation costs of MCs are higher than DCs [7]. According to Jensen and Mackling [8] extraordinary monitoring costs exist for MCs as a result of having activities in different political systems, complicated cultural issues and newer organizational environments [9], therefore, their debt levels are expected to decline. In addition, geographic diversity of MCs increases their audit costs and this issue is expected to decline debts level as well. Therefore, most previous experimental researches, especially those performed in American countries have shown that MC's keep a relatively lower level of debts in their capital structure compared to DCs [10, 11].

Usha R. Mittoo & Zhou Zhang[6] compared the effect of multi-nationality on capital structure of American and Canadian firms. In this research they made use of independent variables including agency costs, access to international debt markets and commercial risks in order to evaluate the effect of multi-nationality on the dependent variable of leverage. Their findings indicated that in contrast to American firms, multinational Canadian companies had a higher leverage compared to domestic companies. This higher leverage is due to less agency costs for activity in American markets.

A very remarkable research in this area was performed by Chuck C.Y Kwok and David. M. Reeb[12]. The authors have claimed that the dominant factor for description of main effects of multi-nationality on companies' leverage is different risks of different countries. Results of this research have verified that in American companies becoming multinational is accompanied by reduction of leverage. On the other hand, for companies that are active in emerging markets becoming multinational was directly related to a positive increase in leverage.

Mihir A Desai et al [13] investigate the effect of multinationality on capital structure of American companies with emphasis on the independent variable of political risk. The authors have shown that in countries with higher political risks, volatility of investment returns is extremely higher

than other countries. They argue that multinational companies keep their leverage in a lower level in order to hedge this political risk and make less frequent uses of long-term debts.

Another specifically significant research was performed by Raj Aggarwal and Aung Kyaw[11]. This research investigates the effects of multi-nationality on dependent variables of leverage and dividend policy simultaneously. In order to show the correlation between capital structure and dividend policies, this research has made use of a simultaneous equations framework. This research has elaborated on differences between capital structures of domestic companies and multinational companies and for the first time ever, they argue dividend policy as factor for describing multinationality effect on capital structure is. In contrast to most previous theories, results of this study indicated that multinational companies have a significantly lower leverage than domestic companies and that with becoming multinational; the degrees of leverage and debt are reduced significantly. In addition, considering the findings of this study it seems that compared with domestic companies, multinational companies pay more dividends. This research has strongly supported the simultaneity of dividend policy and capital structure.

As it was mentioned earlier, reviewing the literature of theoretical foundations of this subject, leave us with an unsolved mystery on hand.

Research Design and data
Factors affecting capital structure

In order to select suitable control variables for investigating the impact of multi-nationality on capital structure, it is important to diagnose the effective elements on capital structure. The aforementioned control variables must be consistent with existing theories and empirical evidence obtained from previous studies. In general, theories in this area emerged by publications of results of efforts made by Miller and Modigliani [1] and made a new thought basis regarding capital structure. Their efforts were initials to development of corporation financial concepts. They argue that in an efficient market with no tax and bankruptcy costs, it will not matter what methods the organization undertakes for financing its operations. In other words, firm value is not related to the manner of combination of capital structure. According to their theories, a firm's market value is defined by profitability strength, development plans and growth opportunities. In fact this theory has modified during time in a way that currently not only capital structure is under the influence of tax and bankruptcy costs, there also other effective elements in market such as asymmetric information, moral hazards and other factors undermining the efficient market which affect capital structure.

Trade-off theory

Companies have goals in terms of their debts ratio and they constantly plan for obtaining these goals. According to the trade-off theory a company must exchange debts with stocks to the extent that the final added-value is equal to the added-value yielded from bankruptcy related costs. In this regard a firm's values are maximized. In other words, according to this theory a firm will only achieve an optimized combination of debts and equities when the current value of tax saving is equal with current value of final costs of financial distress. Final costs of financial distress include those costs which are created as a result of lack of realization of commitments. These costs may include: 1) the cost of inappropriate decisions, 2) inability for making new contracts and 3) customers' losses .As the amount of debts increase, the possibility of financial distress and its related costs increase as well. Expected costs of financial distress will reduce firm's value and eliminate the tax savings of debts.

The theory considers capital structure related decisions as tax advantage resulted from receiving a loan. If the bankruptcy costs resulted from lack of ability in repayment of debts were more than tax advantages ,the increasing debts is not suitable anymore and then a less loan will be received [14]. Therefore, trade-off theory suggests a negative relation between leverage and bankruptcy costs.

Pecking order theory

The theory was proposed by Donaldson[15] for the first time and then developed by

Myers[16] and expresses that internal financing is prioritized over external financing. Companies prefer to raise their capital first through internal affairs of the firm and through retained earnings and then, they tend to raise their capital through absorption of debt and finally, when credit risk and the cost of financing from debts is increased as a result of over-borrowing, the last solution left for firms would be issuing the stocks [7]. According to this theory, more profitable companies have less short-term debts in their capital structure and use more long-term debts for exploitation of investment opportunities. In contrast to the theories of agency cost and free cash flows, Myers et al. [7] have anticipated that under high levels of free cash flows, leverage declines.

Myers and Shyam-Sunder [17] suggested a financial funding deficit model for testing the hypotheses of this theory regarding firms' capital structure. They inferred that except for those companies which are close to their suitable level of debt capacity, according to the pecking order of capital structure, funding deficit is completely supplied through issuing new debts. Thus, we expect a positive relation between funding deficit and leverage. This relation is however conditioned at that firms should have performed financial support activities at a level less than their debt capacity. By relying on this model, the funding deficit model is as follows:

$$Funding\ Deficit(FunDef) = DIV_t + X_t + \Delta W_t + R_t - C_t$$

In this relation we have:

DIV_t : Dividend per share

ΔW_t : Net increase in working capital

R_t : Current portion of long-term debts

C_t : Current operation cash flow after tax deduction

X_t : Capital expenditure

Capital structure determinants

In the previous section, we review theoretical foundations of capital structure and related theories. This section elaborates on determinants of capital structure and also certain hypotheses are expressed for testing.

Risk

If companies are able to have a suitable sales condition in market and obtain suitable profits, then their needs for adopting new financial resources especially through absorption of debts decreases. Therefore, possibility of reduction of size, share or combination of sales of products of the company can become an issue for managers. In order to express the probability of fluctuations in specific level of sales, the phrase of business risk is used. In addition, the source of the risk can be lack of supplication of materials, lack of in-time production of products and lack of in-time customer delivery. In this regard, operations of a commercial unit leave the managers and investors with the conflict of obtaining profits from sales of products. On this basis, a criterion for estimation of business risk is operational leverage. Companies and firms with higher operational leverage are more prone to bankruptcy and should possess a lower financial leverage[18].

Many researchers have cited that as a result of being able to perform better diversification in economic markets of different countries, MCs are faced with less business risks and therefore have a higher financial leverage in their capital structure.

Collateral value of assets

Capital structure theories have all cited that the type of assets possessed by companies affect the desirability of that firm's capital structure through different manners. In fact type of asset can be a determining factor for capital structure [19]. In companies, tangible assets or physical assets are considered as an instrument for obtaining debts. Companies which possess tremendous amount of collateral assets, compared to other companies are usually in a better situation for obtaining loans and also these companies will have to tolerate smaller expenses for financial supplication

through debts. This is mostly because these types of assets are more secure for creditors [14]. For this reason, a company's higher COL should be accompanied by higher debts, because higher levels of these assets can act as a guarantee for taking loans. Therefore, we expect to witness a positive and significant relation between leverage and collateral assets of companies.

Regarding comparison of MCs and DCs, it is still unclear that if MCs' collateral assets are different from collateral assets in DCs. In addition, if this is the case, it is also unclear whether this difference has an impact on financial leverage or not [20].

Non-debt tax shield

Do tax advantages of obtaining debts affect the decisions related to financial support and capital structure of companies? To what extent it affects the value of a company?

After works done by Miller and Modigliani, these questions surfaced for researchers. Although that researchers do not have a general agreement on importance of variables and their manner of affecting a firm's value, but results of recent studies have shown that tax advantages is a factor which affects financial support related decisions of a company.

The effect of tax on capital structure is obviously related to every country's specific tax system. Akhtar S. [2] has expressed that with respect to Australia's newly adopted tax imputation system, the ability of tax shield of debts can no longer be used as an incentive for tendency towards using debts in capital structure.

DE Angelo and R.Masulis [21] developed an optimal capital structure model in which the effect of a company's tax performance, special taxes and tax shield free debts have been accounted for together. They concluded that firms and companies with higher tax-shield free debts are in contact with expected cash flows and therefore, keep a lower level of debt in their capital structure.

Profitability

In his pecking order, Myers cited that companies prefer to raise their capital through accumulated profits and then, thorough obtaining debts and issuance of new shares ultimately. He also states that this type of behavior might be sourced from high costs of share issuance and agencies. In his theory, he has shown that if a company has higher profitability, the firm or the company most probably makes use of internal resources for financial supplication rather than external resources. Therefore, one may expect these companies to keep lower financial leverages in their capital structure, because it is much easier to supply capital through accumulated profits.

While comparing MCs and DCs; as a result of having access to more than one source of income and having a better commercial status, MCs are more prone to obtain higher profits. As a result, MCs are probably more profitable than DCs and also MCs make less uses of debt in their capital structure [2].

Firm Size

Many scholars have approved and validated the existence of a relation between firm size and debt ratio. Larger companies are more diversified and are less prone to bankruptcy. According to this, larger firms should make use of more debt ratios in their capital structure [22].

Usually, larger companies are more exposed to public and this forces these larger companies to expose more information to people, customers, suppliers, analyzers and governmental organizations as well. On the other hand, supplication of information for these companies is relatively easier, because these companies have already provided required infrastructures and resources in order to provide the stock holders with adequate related information. In addition, compared to smaller firms, these large firms undergo less expense for collection of subsidiary information. On this basis, from the perspective of lack of information consistency, compared to small firms, larger firms are able to obtain debts with more moderate prices. This is mostly because creditors have hard time obtaining information regarding smaller firms. In addition, smaller firms undergo higher operation costs. On this basis existence of a positive relation between firm size and ratio of debts is expected [2]. In most cases it has been concluded that MCs are larger than DCs [20, 22]. On this basis, if other factors are remained constant, MCs probably have more long-term debts

compared to DCs [20].

Growth

Equity controlled companies have a high tendency for investment with the aim of settlement of their debts. Costs of agency are also higher for companies with higher opportunities for future growth. This is because these companies are more flexible in terms of choosing their future investment. Therefore, we expect to witness a negative relation between future growth and long-term debts. In addition, Myers has cited that in order to reduce a company's agency costs it is better to make use of long-term debts instead of short-term debts. According to this perspective, there is the possibility for existence of a positive relation between short-term debts and future growth [22].

As a result of having commercial activities in more than just one country and having the ability of benefitting from more growth opportunities, MCs are expected to be provided with more opportunities of future growth compared to DCs. Therefore, MNC,s make use of lower debts in their capital structure.

Dividends

One of the issues which have been mostly disregarded in previous studies regarding effects of multi-nationality of companies on capital structure is the variable of dividend profits which has a reverse effect on debt ratio. In this regard, paying more profits to the stock holders is followed by reduced accumulated profits. As a result, the firm's need for being financially supplied by external resources increases and accordingly, debt ratio will be increased. While comparing MCs and DCs, as a result of increased agency costs resulted from activities in different social, cultural and economic environments, more profits are distribute among the stockholders to mitigate the agency costs. As a result, paying more profits requires external supplication and obtaining debt for MCs. In addition, dividends and debt are both used as substitute mechanisms to mitigate managerial agency costs of under- and over-investments (Jensen, 1986)

Agency costs of debt

Since managers can make personal use of free cash flows, agency related issues are increased and also the firm's value is decreased [8] In addition, costs of debt attraction agency including accounting, surveillance and other costs lead to formation of a contradiction of interests between creditors, stockholders and managers [8]

High agency costs are expected to result less uses of debt in capital structure [5]. The higher agency costs of debt can lead to a higher cost of debt and, consequently, a lower leverage because bondholders must devote more resources in monitoring the firm. Costs of agency result in occurrence of interest conflict between managers and stockholders and between stock holders and creditors[6].

Compared with DCs, MCs have higher agency costs and therefore less leverage for two reasons: First, the geographical spread of multinational corporations operating environment (due to different languages and legal systems) makes it more difficult for lenders to monitor and collect information[9]. Secondly, because of their better access to international markets, they have higher growth opportunities and companies with higher growth opportunities have higher agency costs and lower leverage[23].

Compared to DCs, the MCs are expected to undergo higher agency costs [24]. Therefore, we expect the debt levels of MCs to be lower than DCs.

Research Model

The main model of this research has been determined as follows in form of a multivariate regression model:

Model No. 1:

$$LEVERAGE = a_0 + a_1 BusRisk + a_2 ROA + a_3 MTB + a_4 COL + a_5 NDTS +$$
$$a_6 Lsize + a_7 DOL + a_8 FundDef + a_9 Tax + a_{10} DivPO + a_{11} Fsale$$

Considering the above mentioned model, the research variables include two groups of dependent variables and independent variables.

A) Dependent variables

The dependent variable of this study is the ratio of long-term debts as an index of capital structure. It is calculated through the following formula:

LEVERAGE=LTD/ (LTD+MVE)

MVE: Market value of equity

B) Independent variables

In this study profitability, growth opportunities, collateral assets, firm size, ratio of dividend payouts, non-debt tax shield, tax rates, exports (foreign sales), business risk and bankruptcy costs have been selected as independent variables. Each of the variables has been explained further in table 1.

Table 1: variables definition

variable	symbol	Definition	Unit
Leverage	LEV	Ratio of long-term debts to sum of long-term debts and market value of equity	Ratio
Foreign sales Ratio	Fsales	Total foreign sales divided by total sales	Percentage
Multinational Dummy	M	Dummy variable for multi-nationality (value 1 for exports of more than 2% and value 0 other wise)	0 or 1
Business Risk	BusRisk	Standard deviation of first difference in EBIT divided by total assets in 3 years	Std Dev.
Dividend Pay out	DivPO	Ratio of DPS to EPS	Percentage
Degree of Operating Leverage	DOL	Annual changes divided by percentage of changes in sales	ratio
Profitability	ROA	Earning before interet and tax divided by total asset	Percentage
Growth Opportunity	MTB	Market value divided by book value of the firm at the end of fiscal year	ratio
Collaterals	COL	Ratio of constant assets to total assets	ratio
Non-Debt Tax Shield	NDTS	Ratio between depreciation to total assets	ratio
Funding Deficit	FundDEF	$Funding\ Deficit(FunDef) = DIV_t + X_t + \Delta W_t + R_t - C_t$	
Tax Rate	Tax		
Firms size	Lsaze	Natural log of total assets	number

Research Methodology

Research hypotheses

Main hypothesis: a significant difference exists between capital structure of multinational and domestic companies.

Subsidiary hypotheses:

Hypothesis 1: The impact of dividend payout on the ratio of long-term debts is significant and negative.

Hypothesis 2: The impact of profitability on the ratio of long-term debts is significant and negative.

Hypothesis 3: The impact of firm size on the ratio of long-term debts is significant and positive.

Hypothesis 4: The impact of collateral assets on the ratio of long-term debts is significant and positive.

Hypothesis 5: The impact of growth opportunities on the ratio of long-term debts is significant.

Hypothesis 6: The impact of funding deficit on the ratio of long-term debts is significant and negative.

Hypothesis 7: The impact of tax rates on the ratio of long-term debts is significant and negative.

Hypothesis 8: The impact of business risk on the ratio of long-term debts is significant and negative.

Hypothesis 9: The impact of non-debt tax shield on long-term debts is significant.

Hypothesis 10: The impact of level of operational leverage on the ratio of long-term debts is significant and negative.

Research Method

The present study is aimed at answering the question that if the aforementioned determinants have different and significant effects on capital structure of MCs and DCs listed in Tehran's stock exchange or not. In terms of methods, this study is a descriptive-correlative research and also in terms of manner of data collection, it is a post-event study. In order to compare the profits dividing policies of MCs and DCs, the t-test and the Mann-Whitney test have been used as well as a multivariate linear regression model under a least squares approach.

Population and Sample

The population includes all listed companies in Tehran Stock Exchange in the period 2008-2013 during which their information was available and consists of the following conditions. 1 – Information is available during the research period. 2 – Fiscal period of companies lead to end of Isfand Iranian calendar each year. 3 – No change occurs in the financial period from 2008 to 2013. 4 – Companies have no trading interval exceeding 6 months from 2008 to 2013. 5 – They are not part of holding companies, investment, banks, insurance, financial institutions and financial intermediation. Applying the above constraints, 712 companies were selected by using screening method.

Empirical Results
Descriptive statistics

Table 2: descriptive statistics for all data

variables	LEV	DivPO	BusRisk	ROA	MTB	COL	NDTS	Lsize	DOL	FundDEF	Tax	Fsales
All firms												
number	712	712	712	712	712	712	712	712	712	712	712	712
average	0.135	61.321	0.066	12.798	3.28	0.27	0.036	12.953	0.43	39.627	11.35	0.086
SD	0.152	44.589	0.074	12.475	4.331	0.174	0.037	1.312	16.705	322.553	10.953	0.175
MIN	0	0	0.002	-31.272	-13.464	0	0	9.778	-280.828	-60.329	-22.5	0
MAX	0.947	553.349	0.599	62.74	48.663	0.889	0.377	18.195	293.445	6809.395	191.215	1
MC												

number	356	356	356	356	356	356	356	356	356	356	356
average	0.12	64.626	0.072	14.859	3.927	0.275	0.041	13.218	0.225	20.288	10.919	0.172
SD	0.123	43.561	0.088	14.074	5.435	0.18	0.04	1.27	5.812	21.948	8.043	0.215
Min	0	0	0.002	-31.272	-13.464	0.003	0	9.797	-99.919	-59.91	0	0.02
Max	0.678	485.386	0.599	62.74	48.663	0.814	0.291	18.195	25.315	102.586	42.063	1
DC											
number	356	356	356	356	356	356	356	356	356	356	356	356
Average	0.15	58.016	0.06	10.737	2.634	0.265	0.032	12.688	0.635	58.967	11.78	0
SD	0.176	45.414	0.055	10.252	2.68	0.169	0.033	1.301	22.913	455.129	13.237	0
MIN	0	0	0.003	-19.765	-10.287	0	0.003	9.778	-280.828	-60.329	-22.5	0
MAX	0.947	553.349	0.443	44.944	19.234	0.889	0.377	16.437	293.445	6809.395	191.215	0

Main hypothesis
There is a significant difference between capital structures of DCs and MCs.

In this hypothesis, the average difference of ratio of long-term debts of both MCs and DCs are subjected to statistical tests through t-test and Mann-Whitney test as an index of capital structure. Findings obtained during estimation of main hypothesis are shown in figure 3. With respect to obtained significance value, for the t-test the main hypothesis is accepted at a confidence level of 99%. It means that multi-nationality of companies has a significant effect on their capital structure. There also exists a significant difference between capital structure of MCs and DCs. In this regard, multinational companies keep a lower leverage in their capital structure. Findings of this research are in contrast with traditional theories which cited that as a result of being larger in size and having more diversification advantages; MCs should have higher debts compared to DCs. These findings are consistent with the findings obtained by Lee & Kwok [3] and Doukas & Pantzalis [5].

Table 3 results of tests of t and Mann-Whitney for the main hypothesis

Dependent variable	Sig.	t-test	Sig.	Mann-Whitney	Hypothesis result
LEV	0.008	2.657	0.123	59140500	accepted

For further explanation and for having a better comparison of MCs and DCs, the results of the t-test plus the Mann-Whitney test for independent variables of the model are presented in the following table.

Table 4 results of t and the Mann-Whitney test

	DivPO	BusRisk	ROA	MTB	COL	NDTS	Size	COL	FundDEF	Tax
MCs(mean)	64.626	0.072	14.859	3.927	0.275	0.041	13.218	0.225	20.288	10.919
DCs (mean)	58.016	0.06	10.737	2.634	0.265	0.032	12.688	0.635	58.967	11.78
t-test	-1.982	-2.18	-4.467	-4.026	-0.75	-3.17	-5.503	0.328	1.602	1.048
Significance	0.048	0.03	0	0	0.454	0.002	0	0.743	0.11	0.295
Mann-Whitney	-2.648	-0.245	-4.294	-4.523	-0.413	-1.904	-6.02	-4.038	-2.116	-0.851
Significance	0.008	0.806	0	0	0.68	0.057	0	0	0.034	0.395

Subsidiary hypotheses

In the following, by making use of the linear multivariate regression model, we try to test the subsidiary hypotheses for both MCs and DCs. Before starting this test, there are some conditions that need to hold. First, in order to investigate the normality of the variable of total debts, we use the Kolmogorov-Smirnoff test. As you can see in table 5, after normalization we have obtained a

significance value of larger than 0.05. Therefore, it can be said that this variable is normal.

Table 5 results of Kolmogorov-Smirnoff test

Dependent variable	Type of firms	number	K-S	Sig.
LEV	MCs	356	1.703	0.324
	DCS	356	1.119	0.112
	Total	712	1.560	0.125

After this test, the variance analysis test was performed in order to validate the credibility of the multivariate linear regression test for each group of MCs and DCs. Results are shown in table 7. According to significance values obtained which is less than 0.05 for both groups, then this model has adequate credibility.

Table 6 Total significance of regression

LEV	model	Sum of squares	d.f	mean squares	F	Sig.
MCs	Regression	131.596	11	11.963		
	Residual	220.870	344	0.642	18.633	0.0
	Sum	352.465	355			
DCs	Regression	111.327	10	11.133		
	Residual	243.852	345	0.707	15.751	0.0
	Sum	355.179	355			

Figure 7 shows that for MCs, the value of Durbin-Watson statistic is equal to 1.749. This value is larger than 1.5 and therefore there is no correlation related errors. In addition, the reformed determination coefficient is equal to 0.318 and this shows that this model is able to anticipate approximately 32% of long term debts. On the other hand, for DCs the value of Durbin-Watson statistic is 1.919 which is also larger than 1.5 and therefore there are no correlation related errors. In addition, the reformed determination coefficient is equal to 0.294 and this shows that this model is able to anticipate approximately 30% of long term debts.

With respect to above mentioned validations, results of the multivariate regression are shown in table 7.

Table 7 coefficients of the regression model

Independent variables	MCs		DCs	
	Coefficient	Sig.	Coefficient	Sig.
constant	-1.428	0.001	-1.737	0.001
BusRisk	-0.178	0.690	0.251	0.805
ROA	-0.017	0.00	-0.040	0.00
MTB	-0.025	0.002	-0.061	0.004
COL	0.738	0.002	0.760	0.025
NDTS	3.262	0.004	-1.206	0.494
Size	0.122	0.00	0.201	0.00
DOL	-0.014	0.025	-0.003	0.182
FundDEF	-0.0003	0.845	0.0002	0.807
Tax	-0.012	0.013	-0.006	0.136

DivPO	-0.001	0.120	-0.004	0.002
MCs	Adjusted R2=0.318		Durbin-Watson=1.749	
DCs	Adjusted R2=0.294		Durbin-Watson=1.919	

$$LTD_{MC} = -1.428 - 0.017(ROA) - 0.025(MTB) + 0.738(COL) + 3.262(NDTS)$$
$$+ 0.122(LSize) - 0.014(DOL) - 0.012(TaxRate)$$

$$LTD_{DC} = -1.737 - 0.040(ROA) - 0.061(MTB) + 0.760(COL) + 0.201(LSize)$$
$$- 0.002(DPR)$$

Results shown in figure 7 try to show the effective which express the differences between capital structures among MCs and DCs

First subsidiary hypothesis:

With respect to figures, significance values obtained from tests show a significant difference in terms of average of business risk among MCs and DCs. In this regard, MCs are more exposed to risks. With respect to figures, the effect of business risk is negative for capital structure of both MCs and DCs. However, for none of these companies this effect was significant.

Second subsidiary hypothesis:

The effect of profitability is significant and negative for both groups. This effect is respectively -0.009 and -0.012 for MCs and DCs. This means that if a company's net profits are increased, they will tend to make less use of debts. On the other hand, with respect to table 4, MCs have higher profitability compared to DCs. According to aforementioned analyses, it becomes clear that not only profitability has a significant and negative effect on capital structure, but also in MCs this effect is higher than DCs as a result of having higher profitability.

Third subsidiary hypothesis:

According to analyses shown in table 4, at a confidence of 99% it can be stated that there exists a significant difference among growth opportunities of MCs and DCs. In this regard, MCs with an average of growth of 3.927 have a higher growth ratio compared to DCs with an average of growth of 2.634. Regression results have also approved the significant negative effects of growth opportunities on leverage in both MCs and DCs. On this basis, on the one hand with respect to negative effects of growth opportunities on level of financial debts and on the other hand, since MCs are provided with more growth chances, it is expected that growth opportunities have a more negative effect on capital structure in MCs. In fact these companies make use of lower financial debts in their capital structures.

Fourth subsidiary hypothesis:

With respect to results of the t-test, no significant difference was found between collateral assets of MCs and DCs. In addition, with respect to the results of regression, the effect of this variable was found to be significant on capital structure for both MCs and DCs. For MCs significance was calculated as 99% and for DCs it was calculated as 95%. Therefore, it can be claimed that companies and firms which possess more collateral assets, have more capabilities in terms of obtaining loans. In this regard, the direct relation between collateral assets and ratio of long-term debts is approved.

Fifth subsidiary hypothesis:

Results of figure 4 showed that there exists a significant difference between tax shield debts of MCs and DCs. In this regard, with a confidence of 99% it can be said that MCs are provided with more tax shield debts. Results of regression indicated that this variable has a significant and positive effect on capital structure of MCs. However, for DCs this relation was not significant.

Sixth subsidiary hypothesis:

Natural logarithm of size of MCs and DCs is respectively 13.218 and 12.688. This shows a significant difference at confidence level of 99%. In this regard, MCs are larger than DCs. With respect to results of regression, this variable has a positive and significant effect on capital structure for both MCs and DCs. In other words, larger firms are more capable in terms of obtaining debts. If other variables are held constant, as a result of being larger the MCs wll have higher long-term debts.

Seventh subsidiary hypothesis:

With respect to table 4, significance level of the difference between operational leverage in MCs and DCs is 0.328. This value is larger than 0.05 and therefore, no significant difference was observed between operational leverage of MCs and DCs.

In terms of capital structure, the effect of operational leverage was significant and negative. However this effect was not significant for DCs.

Eighths subsidiary hypothesis:

Results of the figure 4 show that significance levels obtained from the t-test and the Mann-Whitney test show a lack of difference in average commercial deficiencies of MCs and DCs. Results of table 7 also have shown that there exists no significant relation between the variable of commercial deficiency and capital structure among both MCs and DCs.

Ninth subsidiary hypothesis:

With respect to figure 4, significance levels obtained from the t and the Mann-Whitney test for the variable of tax rates is 0.295.this error value is larger than the acceptable range of 5%. Therefore there are no significant differences in average rate of taxes between MCs and DCs. with respect to figure 7, effects of tax rates on capital structure of both MCs and DCs is positive but not significant for any of them.

Tenth subsidiary hypothesis:

With respect to figure 4, a difference is evident between average dividend profits of MCs and DCs. In this regard, compared to DCs, MCs divide more profits between their stock holders. With respect to figure 7, this difference was not significant. For DCs this variable had a significant different effect on capital structure. The effect of dividend payout on long-term debts in DCs is equal to -0.0006.

Conclusions

This study investigates the determinants of capital structure of MCs and DCs listed in Tehran stock exchange. Results showed that, compared to DCs, MCs have a significantly lower leverage. In addition, MCs are significantly larger than DCs and are provided with more growth opportunities, more profitability, and have more non-debt tax shield and higher business risk. However, they pay more dividends to their stockholders.

Main theories regarding capital structure express that as a result of diversification advantages and having a larger size, MCs have higher debts. In contrast, empirical results of this research have shown that these companies have a lower debt capacity as a result of extraordinary risks imposed by activity in foreign environments.

A negative and significant relation was found between profitability and long-term debts for both MCs and DCs. This shows that external financing will decrease when companies make more profits. This finding is consistent with the finding obtained by Naveed Ahmad et al. [25]. However, this finding is consistence with hypotheses of pecking order theory and is in contrast with trade-off theories.

No significant relation was found between business risk and ratio of long-term debts of MCs

and DCs. These findings are inconsistent with the findings obtained by Burgman [9], Aggarwal and Aung Kyaw [11].

The negative and significant relation was found between the variables of growth opportunities and ratio of long-term debts for both MCs and DCs. This finding is inconsistent with the findings obtained by Titman S., Wessel [22, 26]. In addition these findings are consistent with findings obtained by Nishioka and Baba [27]. In addition, these findings validate the hypotheses of agency cost theory that expresses that companies with higher growth opportunities should take lower loans, in order to be able to control their profitability. As it was expected, companies with larger size and companies with higher collateral assets have higher debt capacity and the relation between both fixed asset and firm size with leverage was significant and positive for MCs and DCs. This result is consistent with the result obtained by Graham [14] and Shami Akhtar [2]. These authors have declared that larger companies are more diversified and are less prone to bankruptcy. According to this content, larger firms should make use of a higher debt ratio in their capital structure. Furthermore finding a positive impact of fixed assets on long-term debts approved the works carried out by Graham [14] and Jensen [28]. These authors proved that companies with high levels of collateral assets are usually in a better status for obtaining loans. Dividend payout has a negative and significant relation with long-term debts in DCs. This means that companies which have higher long-term debts in their capital structure will have to distribute less profits among their stockholders. This finding is consistent with findings obtained by Jensen [8], Aggrawal and Jayaraman [29], Shami Akhtar and Oliver [20] and Aggarwal and Aung Kyaw [11]. However, for MCs this relation was not statistically significant.

No significant relation was found between non-debt tax shield and long-term debts in DCs. For MCs this relation was significant and strongly positive which means that because of tax benefits of export in this country, companies try to benefit more and use higher rate of leverage. This result strongly support the concepts of trade-of theory and is inconsistent with the findings obtained by Di Angelo and Musalis [21]; Titman S. [22], Twite [30] and Raj Aggrawal [31]. Although there is no significant relationship between degrees of operating leverage and long-term debts for DCs, a significant negative relation for MCs was observed between operating leverage as a proxy of firm's risk and usage of loan. This finding is inconsistent with the finding obtained by Aggarwal and Aung Kyaw [11]. For MCs, tax rates had a negative and significant relation with long-term debts, meanwhile in spite of existence of a negative relation between tax rates and long term debts of DCs, this relation was not significant.

The table below displays summary of results.

Main hypothesis	results	
There is a significant difference between capital structures of DCs and MCs.	approved	
Subsidiary hypotheses	results	
	DC	MC
Hypothesis 1: The impact of dividend payout ratio on the ratio of long-term debts is significant and negative.	✓	✗
Hypothesis 2: The impact of profitability on the ratio of long-term debts is significant and negative.	✓	✓
Hypothesis 3: The impact of firm size on the ratio of long-term debts is significant and positive.	✓	✓
Hypothesis 4: The impact of collateral assets on the ratio of long-term debts is significant and positive.	✓	✓
Hypothesis 5: The impact of growth opportunities on the ratio of long-term debts is significant.	✓	✓
Hypothesis 6: The impact of budget deficiency on the ratio of long-term debts is significant and negative.	✗	✗
Hypothesis 7: The impact of tax rates on the ratio of long-term debts is significant and negative.	✗	✓

Hypothesis 8: The impact of business risk on the ratio of long-term debts is significant and negative.	×	×
Hypothesis 9: The impact of tax shield debts on the ratio of long-term debts is significant.	×	✓
Hypothesis10: The impact of level of operational leverage on long-term debts is significant and negative.	×	×

References

Modigliani, F. and M.H. Miller, *The cost of capital, corporation finance and the theory of investment.* The American economic review, 1958. **48**(3): p. 261-297.

Akhtar, S., *The determinants of capital structure for Australian multinational and domestic corporations.* Australian journal of management, 2005. **30**(2): p. 321-341.

Lee, K.C. and C.C. Kwok, *Multinational corporations vs. domestic corporations: International environmental factors and determinants of capital structure.* Journal of International Business Studies, 1988. **19**(2): p. 195-217.

Ramirez, A. and C.C. Kwok, *Settling the debate on multinational capital structure using the CEPR measure.* Journal of Multinational Financial Management, 2010. **20**(4): p. 251-271.

Doukas, J.A. and C. Pantzalis, *Geographic diversification and agency costs of debt of multinational firms.* Journal of Corporate Finance, 2003. **9**(1): p. 59-92.

Mittoo, U.R. and Z. Zhang, *The capital structure of multinational corporations: Canadian versus US evidence.* Journal of Corporate Finance, 2008. **14**(5): p. 706-720.

Myers, S.C. and N.S. Majluf, *Corporate financing and investment decisions when firms have information that investors do not have.* Journal of financial economics, 1984. **13**(2): p. 187-221.

Jensen, M.C. and W.H. Meckling, *Theory of the firm: Managerial behavior, agency costs and ownership structure.* Journal of financial economics, 1976. **3**(4): p. 305-360.

Burgman, T.A., *An empirical examination of multinational corporate capital structure.* Journal of international business studies, 1996. **27**(3): p. 553-570.

Fatemi, A.M., *The effect of international diversification on corporate financing policy.* Journal of Business Research, 1988. **16**(1): p. 17-30.

Aggarwal, R. and N.A. Kyaw, *Capital structure, dividend policy, and multinationality: Theory versus empirical evidence.* International Review of Financial Analysis, 2010. **19**(2): p. 140-150.

Kwok, C.C. and D.M. Reeb, *Internationalization and firm risk: An upstream-downstream hypothesis.* Journal of International Business Studies, 2000. **31**(4): p. 611-629.

Desai, M.A., C.F. Foley, and J.R. Hines, *Capital structure with risky foreign investment.* Journal of Financial Economics, 2008. **88**(3): p. 534-553.

Graham, J.R., *How big are the tax benefits of debt?* The Journal of Finance, 2000. **55**(5): p. 1901-1941.

Donaldson, G., *Corporate Debt Capacity: A Study of Corporate Debt Policy and Determination of Corporate Debt Capacity.* Harvard Graduate School of Business administration, 1961.

Myers, S.C., *The capital structure puzzle.* The journal of finance, 1984. **39**(3): p. 574-592.

Shyam-Sunder, L. and S.C. Myers, *Testing static tradeoff against pecking order models of capital structure.* Journal of financial economics, 1999. **51**(2): p. 219-244.

Shahveisi, F., et al., *The Study of the Relationship between the Capital Structure and the Variables of the Value-based Performance Assessment.* Research Journal of Finance and Accounting, 2012. **3**(7): p. 131-139.

Rajan, R.G. and L. Zingales, *What do we know about capital structure? Some evidence from international data.* The journal of Finance, 1995. **50**(5): p. 1421-1460.

Akhtar, S. and B. Oliver, *Determinants of capital structure for Japanese multinational and domestic corporations.* International review of finance, 2009. **9**(1-2): p. 1-26.

DeAngelo, H. and R.W. Masulis, *Optimal capital structure under corporate and personal taxation.* Journal of financial economics, 1980. **8**(1): p. 3-29.

Titman, S. and R. Wessels, *The determinants of capital structure choice.* The Journal of finance, 1988. **43**(1): p. 1-19.

Myers, S.C., *Determinants of corporate borrowing.* Journal of financial economics, 1977. **5**(2): p. 147-175.

Akhtar, S., *Capital structure and business cycles.* Accounting & Finance, 2012. **52**(s1): p. 25-48.

Ahmed, N., Z. Ahmed, and I. Ahmed, *Determinants of capital structure: A case of life insurance sector of Pakistan.* European Journal of Economics, Finance and Administrative Sciences, 2010. **24**: p. 7-12.

Titman, S., *The effect of capital structure on a firm's liquidation decision.* Journal of financial economics, 1984. **13**(1): p. 137-151.

Nishioka, S. and N. Baba, *Dynamic capital Structure of Japanese firms.* How Far Has the Reduction of Excess Leverage. JAPAN, 2004.

Jensen, M.C., *Agency cost of free cash flow, corporate finance, and takeovers.* Corporate Finance, and Takeovers. American Economic Review, 1986. **76**(2).

Agrawal, A. and N. Jayaraman*, The dividend policies of all-equity firms: A direct test of the free cash flow theory.* Managerial and Decision Economics, 1994. 15(2): p. 139-148.

Twite, G., *Capital structure choices and taxes: Evidence from the Australian dividend imputation tax system.* International Review of Finance, 2001. 2(4): p. 217-234.

Aggarwal, R. and S. Zhao*, The Diversification Discount Puzzle: Evidence for a Transaction-Cost Resolution.* Financial review, 2009. **44**(1): p. 113-135.