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Investigation of the effect of irregularity of accruals on the adjustment rate of capital structure in companies listed in the Tehran Stock Exchange

Abstract

This study aimed to study the effect of irregularity of accruals on the adjustment rate of capital structure in companies listed on the Tehran Stock Exchange. This research is applied in terms of purpose and was performed by the descriptive-correlational method. By using the systematic elimination method, a sample of 106 companies was selected from the companies listed on the Tehran Stock Exchange from 2008 to 2017. Analysis and testing of the study hypothesis along with its results were performed on the results obtained from Eviews 10 software. A regression model was used to test the hypothesis. The findings indicate that the coefficient of variable capital structure (0.401) is significant at the 5% level, and the adjustment rate of capital structure is approximately 59.9% (1-0.401). The coefficient of irregularity of accruals (-0.024) at the -5% level is significant. Furthermore, the product of capital structure and irregularity of accruals (0.068) is positive and significant at the 5% level. This matter reveals that by reducing the irregularity of accruals, the adjustment rate of capital structure drops from 59.9% to 21.5%, and the significance of the coefficient of variable multiplied by the capital structure in the irregularity of accruals indicates the significance of this decrease.

Keywords: *Irregularity of accruals, adjustment of capital structure, listed companies, Accrual Anomaly, Capital Structure, Dynamic Trade-off Theory, Real Earning Management*

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Introduction

Accruals are among the critical components of accounting profit created based on using the accrual accounting approach, and, as a definition, it can be said that "accruals are the difference between accounting profit and related cash flows." Occasionally these items become sporadic due to unexpected price behavior in capital markets where investors can potentially gain abnormal returns. Irregularity of accruals is simply a specific case of abnormality based on the net growth of operating assets based on the balance sheet. Accrual accounting, on the other hand, enhances the ability of profits to mirror the company's performance, therefore minimizing the scheduling and adherence problems inherent in cash flow.[1]

The left part of the balance sheet, encompassing the combination of different financial resources of each company, is called the capital structure[2]. In studying the structure of capital, companies attempt to explain the combination of different financial resources used to finance activities and investments that demand a combination of debt and equity (Myers, 1984).

The objective of deciding the capital structure is to determine the composition of each company's financial resources to maximize the wealth of its shareholders. Hence, if we aim at the capital structure, the rate of companies moving towards this structure and the average time of adjusting the leverage ratios becomes critical in capital structure theories. The Trade-off theory notes that the defects of the capital market form a relationship between the capital structure and the value of the company, and companies take positive measures to fix their deviation from the optimal capital structure. Companies also determine a ratio for target financial leverage based on the balance between tax benefits and costs incurred by debt and alter their capital structure accordingly. One of the most recent approaches presented as a sub-branch of this theory is the Dynamic Trade-off Theory. This theory considers the process of adjusting the corporate capital structure as an expensive process, and considering the adjustment expenses, holds that companies only adjust leverage ratios when the benefits of this adjustment overpower the costs. Huang and Ritter (2009) maintain that estimating the rate at which companies move toward the target lever is currently the most critical issue in capital structure research.

Now, considering the significance of the rate of capital structure adjustment, this study seeks to present the theories of capital structure and the speed of capital structure adjustment to investigate the effect of the rate of capital structure adjustment on the irregularity of accruals in companies listed on the Tehran Stock Exchange. Thus, by studying the irregularity of accruals by embracing strategies based on different criteria and the nature of the objective, the present study aims to fill the existing gap caused by the irregularity of accruals in the rate of adjustment of capital structure in the Tehran Stock Exchange. Therefore, this research aims to investigate the impact of irregularity of accruals on the rate of capital structure adjustment in companies listed on the Tehran Stock Exchange.

Theoretical foundations of research

[1] Ball and Rubin, 2003

[2] Qalibaf Asl, 1994

Irregularity of accruals

The negative association between the levels of accounting accruals and future stock returns is named accrual irregularity. A company with high accruals that hosts unusually low future stock returns experiences anomalies in accruals. Sloan called the negative relationship irregular accruals caused by inexperienced investors in the market. Illegal accruals come to be when investors derive future earnings based on their past, and the values of profits announced in the future will be lower or higher because of the reverse movement of accruals than investors' expectations and will surprise investors (Anderson;1982).

Researchers in the United States have performed an in-depth study on the irregularity of accruals and discovered that investors there are unable to properly comprehend the permanence of different components of earnings. That is, investors are unreasonable predictors. Especially when forecasting earnings for subsequent periods, such investors overvalue the non-accrual profit and undervalue the non-cash profit, which results in a negative association between accruals and returns. This irrational prediction is considered an irregularity of accruals (Altinkilic;2000)

This concept is principally due to incorrect pricing of optional accruals, particularly changes in inventory (Bayless;1991).

Irregularities may be because of incorrect measurement of risk, the outcome of data concealment, or inaccurate measurement of statistical reliability when incorrect pricing is the result of uncertainty about the return-making process. Irregularities can be described by logical structural uncertainty. Investors' psychological orientations may also be the cause of incorrect pricing (Chan, K.S;1993).

Adjustment of capital structure

Capital structure has been and is among the critical fields of financial knowledge and investment. Decades of study in this domain, although not yet conclusive and global, in addition to gathering valuable background, have led researchers to believe that none of the theories of capital structure alone can justify all the temporal and cross-sectional patterns seen in the data. The relative significance of each of these theories has varied in different periods and different studies (Huang and Ritter, 2009). While the hierarchical theory (1984) became the prevailing theory in the 1990s by rejecting the trade-off theory, it was harshly criticized in later years. Until Fama and French published an article in 2005 named "Financing Decisions; Who Issues Shares?" The death of the hierarchical theory of (Myers;1984) and (Majloff ;1984) was declared a complete model of the structure of capital (Fama and French, 2005). Baker and Wurgler, meanwhile, challenged both equilibrium and hierarchical theories with the presentation of market positioning theory in 2002. But this theory itself was challenged and bashed in later studies and papers as well (Huang and Ritter, 2009).

By representing three different scenarios for the costs of adjusting and simulating lever data under these three scenarios, (Leary and Roberts;2005) once again examined the theories of market positioning and inertia. They discovered that the lasting impact of these theories was mostly because of adjustment costs than disregard for capital structure policies. If the expenses of adjusting the financial structure overshadow the benefits, companies will stop restructuring their capital. They figured that the motivations for corporate financing decisions can be explained by a dynamic view of leverage adjustment (Leary and Roberts, 2005). (Dittmar and Thakor;2007) introduced their theory named "Managerial Investment Autonomy" claiming that the chief reason for the allocation of corporate stocks when their stock prices are high is that shareholders at this time are more willing to agree with management decisions. In fact - contrary to market positioning theory, which sees the exploitation of over-pricing as the principal driver of stock issuance - they consider the tacit approval expected by shareholders as the chief driver of stock issuance (Donaldson;1961).

Thus, as it seems, the greatest issue is the absence of a comprehensive theory that can thoroughly explain and predict the financing behavior and capital structure of companies. Nevertheless, there is no indication that such a theory will be devised in the immediate future (Khaleghi Moghadam and Baghumian, 2007). Thus, it may be time to quit competing between theories of capital structure to arrive at a single theory. It may be time to consider the suggested models as complementary partners, each reflecting some of the facts that enable us to explain the different aspects of financing decisions (Fama and French, 2002).

In this research, based on earlier studies (Rajan and Zingales, 1991; Ozkan, 2001; Dong et al., 2012), five common factors influencing financial leverage have been used, namely tangible fixed assets, growth opportunities, non-debt tax shield, profitability, and company size.

(Riccetti, L;2013) have formed models for identifying corporate behavior patterns in capital structure adjustment that enable achieving a target level of debt. They reached a strong adjustment coefficient referred to as a sign of companies pushing toward target debt ratios. Furthermore, using the logit regression model, (Marsh ;1982) discovered that the probability of implementation of financing policies by companies, to the extent of deviation of their current debt ratio from the target debt ratio is very different from one another (Islami Bidgoli and Mazaheri, 2009).

Research background

(Modigliani, F. and Miller, M.H.;1958) investigated the association between earnings management of current

performance and future performance with increasing job security of the CEO in firms listed on the Tehran Stock Exchange. The outcomes demonstrated a significant relationship between earnings management and the tenure of the CEO. There is also a significant relationship between profit management and the current and future performance of companies. Hence, the chief hypothesis of the research, that is the existence of a relationship between earnings management and increasing the job security of the CEO, is confirmed.

In a study to empirically investigate this matter, Kurdistani and Rahimkhani (2008) examined earnings management by examining discretionary accruals and actual measurement activities and the effect of strictly monitoring the association between asymmetry and earnings management. The results indicated that the intensity of monitoring has a negative and significant relationship between information asymmetry and accrual earnings management. Nevertheless, no significant relationship was seen between the effect of monitoring intensity on the connection between information asymmetry and profit management of actual activities.

(Khodamipour et al;2015) studied the market reaction to good or bad news from companies according to the type of profit forecast of the previous year, and the tendency of managers to preserve or correct their reputation in forecasting and comparing the tendency of managers to increase profit management through different types of profit management according to their type of forecast of the previous year. The results indicate that the market response to profit forecast with good (bad) news content, when the earlier period forecast is pessimistic (optimistic), is more positive (negative) than when the previous period forecast is optimistic (pessimistic). Managers also have behavioral consistency in their predictions. Further, the results indicate that optimistic forecasting in the earlier period can contribute to increased profit management in the current period.

(Pereira Alves;2011) studied the impact of this regulation on the management of profits of companies listed on the Tehran Stock Exchange. The results show that following the approval of the corporate governance system bylaws, the independence of the board of directors enhances. Increasing the level of board independence is connected with lower levels of earnings management. Plus, there is no significant association between the separation of the CEO from the chairman of the board of directors and the amount of stock ownership of the managers with earnings management in 2009 compared to 2006.

In a study named "Predicting the level of earnings management using artificial neural networks using variables in the literature of earnings management and using the model of artificial neural networks" Kurdistani et al. (2008) predicted the level of earnings management. The network was tested and trained using data from 2000 to 2008, and eventually, the desired structure was determined with 94% accuracy in the training phase and 69% in the test phase.

(Chen, D.H;2013) studied both types of earnings management and discovered that managers are often involved in managing real earnings during the quarterly offering of stocks, and the drop in performance at the time of quarterly stock offering is more the result of earnings management through actual activities than earnings management through accruals. Because manipulating real activities has real economic outcomes.

(Chen, J;2005) discovered in research that corporations are often involved in profit management by manipulating real activities. The findings revealed that reducing the costs of research and development and overproduction has a positive association with the profits resulting from the manipulation of real activities. Also, the profit yielded through the management of real profits is inversely linked to the future performance of the company. (Cheng, S.R;2007) revealed that companies meet profit targets in the last three months of the year by manipulating real activities such as price decreases to accelerate sales temporarily. Furthermore, firms are more responsive to profit management incentives in competitive situations.

Methodology

This study is applied in terms of purpose and descriptive correlation in terms of technique. In this research, among all companies, those that did not meet all of the following conditions were excluded. Finally, all remaining companies were selected for testing.

• Companies must have complete information for all financial statements such as balance sheets, profit, and loss statements, and cash flow statements.

• The end of their fiscal year should be March 20.

• Companies must be active in the stock market during the research period.

• They must not have altered the fiscal year during the investigation period.

• Company data must be available for at least two consecutive years.

• Companies should not be of the type of investment or financial intermediation.

Research variables

Rate of capital structure adjustment

The traditional model of partial adjustment of the firm's capital structure follows the following regression equation (Flannery and Rangan, 2006):

(1) $$LEV_{it} - LEVL_{it-1} = \lambda(LEV_{it}^{*} - LEV_{it-1}) + v_{it}$$

In this model, LEV_{it} it and LEV_{it}^{*} determine the ratio of real financial leverage (seen) and target financial leverage of company i at time t, respectively. v_{it} is the error component, the details of which will be given later? λ is the rate of

adjustment, which demonstrates how fast companies are moving towards their target financial leverage? This quantity shows how much companies typically close the percentage of the gap between the actual lever and the level of their target lever annually. This coefficient is expected to be between 0 and 1, and the higher the value (close to one) the higher the adjustment rate.

There are two approaches to calculating target financial leverage. According to the first one, the target financial leverage can be acquired from the average or moving average of the financial leverage. The drawback of this approach is that the target financial leverage should remain fixed over time or only depend on leverage decisions of earlier years (Gansen, B.E.;1996) According to the second approach, target financial leverage can be considered a unique ratio determined by the features of the firm in Equation (2) (Flannery and Rangan, 2006):

(2)

$$\mathrm{LEV}_{it}^{*} = \beta' \mathrm{X}_{it}$$

In this model, X_{it} represents the reduction of exogenous factors affecting financial leverage. In calculating Equation (1) along with (2), a one-step process has been employed (Ozkan, 2001; Flannery and Rangan, 2006). In this approach, by putting (2) with Equation (1) and rewriting, the following equation is obtained :

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$$\mathrm{LEV}_{it} = (1-\lambda)\mathrm{LEV}_{it-1} + (\lambda\beta)\mathrm{X}_{it} + \mathrm{v}_{it}$$

By estimating the above relationship, the rate of adjustment of the capital structure (i.e., λ) can be estimated.

It should be noted that market leverage (ML) can be defined as "the debt ratio is usually calculated as book leverage or market leverage". This study, considering the previous studies (Hovakimian et al., 2001; Fama and French, 2005; Welch, 2004; Leary and Roberts, 2005; Flannery and Hankins, 2007; Dong et al., 2012) that have mainly analyzed the debt-to-market value ratio, this criterion is measured as follows.

$$ML_t = \frac{TD_t}{MVE_t + TD_t}$$

Where TD_t is the book value of debts in year t

And MVE_t is the equity market value in year t

Irregularity of accruals

Sloan names the negative and significant association between all accruals and future tenure of stocks accruals irregular (Roodman, D.;2009). In this research, net operating assets are employed as a criterion for the irregularity of accruals. Net operating assets are estimated by the following equation (Jalilvand, A. and Harris, R;1984)

$$\mathrm{AAit} = \frac{\mathrm{OAit - OLi\ t}}{\mathrm{T\ Ait-1}}$$

AA_{it}: Accruals

OA_{it}: Operational assets

OL_{it}: Operational Liabilities

TA_{t-1}: Total assets at the beginning of the year

OL_{it} and OA_{it} are obtained using the following equations respectively:

OAit = TAit - Cit - STIit

Where TA_{it} is Total assets

C_{it} is Cash

STT_{it} is Short term investment

OLit = TAit - STDit - LTDit- Eit

Where STD_{it} is the Current share of long-term debt

LTDit is Long term dets

E_{it} is the Equity

Threshold variables used in this research

Growth Opportunities (BTM)

Based on recent research (Flannery and Rangan, 2006; Antonio et al., 2008; Dong et al., 2012), growth opportunities are obtained by dividing the market value by the book value of the company, with the following formula:

$$\mathrm{GROW_t} = \frac{MVF_t}{\mathrm{TA_t}}$$

Where MVF_t is company market value in year t: the sum of the book value of debt and the market value of equity.

Profitability (EBIT)

Based on the research of Dong et al. (2012) and Drobets et al. (2013) the following equation is used to measure profitability.

$$\mathrm{PROF_t} = \frac{EBITD_t}{\mathrm{TA_t}}$$

Where $EBITD_t$ is the profit before interest and depreciation in year t, which is obtained from the sum of profit before interest and taxes, and depreciation, and is the ratio of operating profit to total assets.

Size

There are different perspectives on how to size a company, the most common of which are discussed below. The first view is total net sales, the second view is the present value of all future cash flows, and the third view is total assets. In the present research, considering studies related to the structure of capital (Byoun, S. ,2008; Dong et al., 2012; McMillan & Kamara, 2012), to determine the size of the company, the third approach has been used, calculated as follows:

Ln: Natural logarithm

Competition in the Product Market (QTOBIN): The ratio of the total book value of debt and stock market value to book value of assets

Asset Compactness (TANG): The ratio of tangible fixed assets to total assets

Effective Tax Rate (TAX): The ratio of tax to profit before tax

Asset Liquidity (LIQ): The ratio of current assets to current liabilities

Inflation Rate (INFL): Percentage of changes in the consumer price index

Following Flannery and Rangan (2006), and (Yang, B;2013) as variables explaining the structure of capital, are included in models (1) and (2).

Finally, the research regression model is as follows.

Model:

$$LEV_{it+1} = \beta_0 + \beta_1 AA_{it} + \beta_2 LEV_{it} + \beta_3 AA_{it} * LEV_{it} + \sum_{j=1}^{8} \beta_j CV_{it}$$

In models (1) and (2), the symbol $\sum_{j=1}^{8} \beta_j CV_{it}$ refers to eight control variables:

Company Size (SIZE): The logarithm of total assets based on ten

Growth Opportunities (BTM): The ratio of book value to market value

Profitability (EBIT): The ratio of operating profit to total assets

Product Market Competition (QTOBIN): The ratio of the total book value of debt and stock market value to book value of assets

Asset Compactness (TANG): The ratio of tangible fixed assets to total assets

Effective Tax Rate (TAX): The ratio of tax to profit before tax

Asset Liquidity (LIQ): The ratio of current assets to current liabilities

Inflation Rate (INFL): Percentage of changes in the consumer price index

Following Flannery and Rangan (2006), and Setayesh and Kargarfard Jahromi (2011), these variables were used to explain.

The analysis and testing of the research hypothesis along with its results are performed according to the outputs acquired from Eviews 10 software.

Results

To analyze the data, descriptive statistics of research variables for application in the post-screening regression model and removal of outgoing data using Eviews software version 10 are listed in Table (1).

Table 1. Descriptive statistics

variable	Symbols	Average	Median	Maximum	Minimum	Standard Deviation
Irregularity of accruals	AA_{it}	0.232	0.295	3.205	0.0004	**0.642**
Capital structure (financial leverage)	LEV_{it}	0.599	0.616	0.951	0.145	**0.167**
size of the company	$SIZE_{it}$	13.692	13.537	18.739	9.821	**1.450**
Growth opportunities	BTM_{it}	0.573	0.494	1.831	-1.030	**0.389**
Profitability	$EBIT_{it}$	10.143	0.133	0.555	-0.644	**0.126**
Product market competition	$QTOBIN_{it}$	1.510	1.342	4.215	0.565	**0.600**
Tangible fixed assets	$TANG_{it}$	0.232	0.189	0.838	0.018	**0.165**
Effective tax rate	$TAXR_{it}$	0.111	0.125	0.372	0	**0.083**
Liquidity of assets	LIQ_{it}	1.360	.257	4.594	0.223	**0.614**
Inflation	INF_{it}	19.325	18.438	34.731	10.753	**8.078**

The results of Levin-Lin Chou's mana test are shown in Table (2), which indicates the mana boon of all variables at a significance level of 0.05.

Table 2. Results of Levin-Lane and Chow's mana test

variable	Symbols	Test statistics	Probability
Irregularity of accruals	AA_{it}	-35.884	**0.000**
Capital structure (financial leverage)	LEV_{it}	-7.753	**0.000**
size of the company	$SIZE_{it}$	-2.448	**0.007**
Growth opportunities	BTM_{it}	-12.900	**0.000**
Profitability	$EBIT_{it}$	*-11.838*	**0.000**
Product market competition	$QTOBIN_{it}$	-12.514	**0.000**
Tangible fixed assets	$TANG_{it}$	-11.858	**0.000**
Effective tax rate	$TAXR_{it}$	-19.181	**0.000**
Liquidity of assets	LIQ_{it}	-0.940	**0.000**
Inflation	INF_{it}	-22.186	**0.000**

This study aimed to determine the effect of irregularity of accruals on the speed of adjustment of capital structure, which is fitted using the following regression model, which shows the effect of irregularity of accruals this year on the capital structure of next year. In this way, we can say to what extent the irregularity of accruals this year will change (adjust) the capital structure of next year.

The Regression model:

$$LEV_{it+1} = \beta_0 + \beta_1 AA_{it} + \beta_2 LEV_{it} + \beta_3 AA_{it} * LEV_{it} + \sum_{j=1}^{8} \beta_j CV_{it} + \varepsilon_{it}$$

Table 3. Test results of the second main research hypothesis

Variable	Symbols	Coefficient	S D	t-Statistic	Probability	VIF
Capital Structure	LEV_{it}	0.401	0.094	4.230	0.000	1.750
Irregularity of accruals	AA_{it}	-0.024	0.010	-2.422	0.015	6.445
Irregularity of accruals * Capital structure	$AA_{it} * LEV_{it}$	0.068	0.022	3.068	*0.002*	6.694
size of the company	$SIZE_{it}$	-0.016	0.012	-1.339	*0.180*	2.925
Growth opportunities	BTM_{it}	-0.071	0.028	-2.465	*0.013*	5.182
Profitability	$EBIT_{it}$	-0.379	0.122	-3.098	*0.002*	6.956
Product market competition	$QTOBIN_{it}$	-0.037	0.023	-1.599	*0.110*	5.387
Tangible fixed assets	$TANG_{it}$	0.473	0.172	0.755	0.006	2.605
Effective tax rate	$TAXR_{it}$	-0.209	0.240	-0.871	0.383	2.407
Liquidity of assets	LIQ_{it}	-0.142	0.036	-3.921	0.001	3.494
Inflation	INF_{it}	0.0003	0.0002	1.164	0.224	1.638
Sargan statistic					**36.012**	
Sargan statistical Significance					**0.071**	

The non-significance of the Sargan statistic indicates that the tools used in model estimation are sufficiently valid. Plus, the results of the VIF linear test in Table (3) reveal that the value of the VIF statistic for the independent variables of all research models is less than 10. Hence, there is no acute alignment problem between the independent variables of research models.

The results show that the coefficient of variable capital structure (0.401) is significant at the 5% level, and the rate of adjustment of the capital structure is about 59.9% (1-0.401). The coefficient of irregularity of accruals (-0.024) is significant at the -5% level.

Further, the product of capital structure and irregularity of accruals (0.068) is positive and significant at the 5% level, revealing that with the decrease in the irregularity of accruals, the rate of adjustment of capital structure drops from 59.9% to 21.5% (0.401 + 0.068). Plus, the significance of the coefficient of variable multiplied by the capital structure in the irregularity of accruals indicates the significance of this decline.

Conclusion

This study aimed to investigate the effect of irregularity of accruals on the rate of adjustment of capital structure in companies listed on the Tehran Stock Exchange. The results indicated a significant negative association between the irregularity of accruals and the rate of adjustment of capital structure. The results also demonstrated that the coefficient of variable capital structure (0.401) is significant at the 5% level. The coefficient of irregularity of accruals (- 0.024) at the 1% level is negative and significant. Further, the coefficient of the variable product of the capital structure in the irregularity of accruals (-0.068) is positive and significant at the 1% level. This proves that with decreasing the irregularity of accruals, the rate of adjustment of the capital structure decreases from 59.9% to around 21.5%. And the significance of the coefficient of variation multiplied by the capital structure in irregular optional costs demonstrates the significance of this decline.

Among other control variables, growth opportunity coefficient (-0.071), profitability (-0.379), tangible fixed assets (-0.473), liquidity of assets (-0.142), and inflation (0.0003) is significant at the 5% level. The significance of the Sargan statistic (36.012), the significance of the Arellano-Bond serial autocorrelation test in the first interval (0.002), and the lack of significance in the second interval indicate the validity of the model estimation results.

According to the sampling method used in this study, some industries in the statistical community have been excluded from the statistical sample due to a lack of the desired characteristics. Therefore, necessary caution should be exercised in generalizing the results of the research to all companies listed on the Tehran Stock Exchange. Managers, investors, and creditors of companies are suggested to calculate the rate of adjustment of the capital structure of their companies using the model estimated in this study so that they can have better and more complete information on the financial management of firms.

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