



## Analysis of the role of managers' characteristics in the relationship between cash flow statement headings and capital structure adjustment speed

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### ABSTRACT

Recent empirical evidence about capital structure shows that the unobservable factors of the company can affect the effect of financial variables on the capital structure of companies. Among these intangible factors, we can mention the behavioral and personality characteristics of managers. In the present study, to check the truth of this claim, the role of managers' characteristics was analyzed in the relationship between the headings of the cash flow statement and the speed of capital structure adjustment. To achieve this purpose, the information of 106 companies from the member companies of Tehran Stock Exchange in the period of 2008 to 2021 was selected as a screening sample.

First, the effect of each cash flow statement class on adjustment speed in high and low leverage companies was tested through rolling regression. Then, in order to test the moderating role of managers' characteristics on the relationship between each of the classes of the cash flow statement and the speed of capital structure adjustment in companies with high and low optimal leverage, the sample was first divided into two groups of high and low characteristics based on the characteristics of managers. Then, the models were tested for each group separately. To examine the moderating role of managers' characteristics, Paternoster et al.'s (1998) approach has been used. The results show that firstly, the speed of reaching the optimal leverage is higher in companies with low optimal leverage than in companies with high optimal leverage. Secondly, the cash flow from operations is a moderating factor in the adjustment speed of optimal leverage for companies with high optimal leverage. In addition, the results showed that the characteristics of CEOs are only moderators on the relationship between operational activities and the speed of capital structure adjustment in highly leveraged companies.

**Keywords:** cash flow, behavioral finance theory, capital structure adjustment speed, overconfidence, ownership, ability, tenure.



## 1. Introduction

Financing decisions are one of the most important financial management decisions to the extent that such decisions are considered part of the company's strategic decisions due to the effects they have on the financial structure of companies and investors' resources. The appropriate capital structure consists of the optimal combination of debt and equity to provide financial resources needed by companies (Sheri Anaghiz, Rahmani and Mohseni Maleki, 2014).

Cash balances account for an important part of the assets of business units and have always attracted the attention of various researchers (Jamari, Azizi, 2018). The cash flow statement expresses all changes in cash in the language of non-cash items and is also prepared from other financial statements and analysis of increases and decreases related to the balances of specific accounts. In the two-way accounting system, the change in cash and quasi-cash items must be equal to the total changes in all other accounts. The cash flow statement discloses the reasons for changes in cash and quasi-cash during the reporting period through the disclosure of all transactions that affect cash and quasi-cash items. The cash flow statement is a supplement to the profit and loss statement and the balance sheet. That is, through the disclosure of the details of the amount of cash resulting from operational activities, it complements the statement of profit and loss, and through the disclosure of events, transactions and exchanges related to the circulation of cash that has caused changes in assets, liabilities, and equity, it is a supplement to the balance sheet, and from Since the cash flow statement is not affected by different accounting approaches regarding the same transactions and events at the level of different business units, its presentation increases the comparability of the operational aspect of the financial performance of different business units. Since financial statements are an important source of information about financial performance, financial conditions and resource monitoring, they can be used in predicting financial crisis. The cash flow statement provides relevant information that can help users evaluate the company's performance and predict the future separately from the balance sheet and the profit and loss statement. Many studies have been done on the cash flow statement, all of which show the usefulness of the cash flow components in predicting

the financial crisis (Etamadi and Zandi, Dareh Gharib, 2013).

It is necessary to examine cash flow as an influencing factor on the speed of adjusting the capital structure. Therefore, studying the impact of cash flow seems relevant because a positive cash flow leads to lower transaction costs. Accordingly, in this study, cash flow statement categories have been tested as variables affecting the speed of capital structure adjustment.

## Theoretical foundations and research literature

Traditional capital structure research shows that optimal capital structure maximizes firm value and firms adjust their leverage based on target (optimal) levels. The optimal level of capital structure is determined based on the benefits and costs of debt. The static trade-off theory of capital structure assumes that managers understand the benefits and costs of debt and by adjusting the capital structure of companies, they try to achieve maximum value even if they move away from the target leverage level. The theory of parallelism, with its ups and downs, is still considered one of the valid and explanatory theories of capital structure. One of the most important results that it brings is the speed of movement of companies in line with this dynamic adjustment (Sarлак, Farji, Izdpour and Jodaki Chegani, 2017). It is expected that in companies where the current leverage is more than the target leverage, the leverage will be adjusted towards the target faster than the companies in the opposite category (Kung, 2012; Smith, Chen, and Anderson, 2015). The speed of capital structure adjustment depends on the amount of transaction costs associated with the changes. The requirement to achieve a new capital structure is different among companies (Castro et al., 2016).

Companies often deviate from their target leverage and slowly adjust the capital structure to the target level, and the argument of relative adjustment of the capital structure is raised. Stock buybacks and debt repayments decrease liquidity and possibly minimize the possibility of valuable investments in the future. Therefore, firms and managers wait until the benefits of capital structure adjustment offset or exceed the associated costs (DeAngelo et al., 2010). Therefore, if the adjustment costs exceed the benefits of operating

with an optimal capital structure, companies have no incentive to adjust their leverage. Therefore, firms rebalance only if their actual leverage deviates significantly from the target leverage.

The capital structure adjustment speed is defined as the ratio of the observed (actual) leverage deviation change to the optimal (target) leverage. Adjusting a firm's financial structure leads to transaction costs, which include information costs, bargaining costs, and monitoring costs. One of the factors that determine the capital structure of a business unit is its asset structure, the most influential part of which is tangible assets, including cash. Managing cash is one of the important duties of managers in order to maximize the wealth of shareholders, and the lack of proper management makes the company face many problems (Dastgir, Yousefi Imani, 2013). Cash flow is a resource that includes low transaction costs.

In a research entitled "Relative information content of operating cash flows and financing in the proposed cash flow statement" in 2010, Francis compared the relative information content of operating cash flows and financing in the five-stage and three-stage cash flow statement. Is. The results of this research show that there is no significant difference between the relative information content of five-stage and three-stage financing cash flows.

In 2016, in their research entitled "Target leverage and speed of adjustment during the life cycle of European companies", Castro et al. examine the speed of leverage adjustment in three stages of the life cycle of companies (introduction, growth and maturity). But they have not considered the cash flow statement as an influencing factor. In 2017, Defour et al. conducted a study titled "Effect of cash flow on the speed of adjustment of the optimal capital structure" on medium and small French companies. In the first stage, they considered two levers: a short-term lever and a long-term lever. In the second step, the aim is to estimate the speed of adjustment by distinguishing between high and low leverage companies. They found a significant difference in adjustment speed between high-leverage firms and low-leverage firms for short-term leverage. Also, the results showed that for companies with high leverage, the speed of companies with positive cash flow is higher than the speed of companies with negative cash flow.

Hu, Lu, Bai in 2021 in their research entitled "The effect of liquidity on adjustment speed", investigated

the effect of liquidity in individual companies in 35 countries between 1996 and 2016. They found that companies with more liquidity adjust their capital structure significantly faster. They also found that there is a positive effect of liquidity in highly leveraged companies and this effect is moderated in countries with bankruptcy codes. In addition, they found that the positive relationship of liquidity on adjustment speed is less clear for companies located in strong institutional environments. The results provide new insights into the role of liquidity on firm's capital structure decisions and determine capital structure dynamics. But in this research, the impact of each class of cash flow statement was not investigated. They only examined the liquidity measure. Also, they did not examine non-financial characteristics as an influencing factor.

In addition, they found that the positive relationship of liquidity on adjustment speed is less pronounced for firms located in strong institutional environments. The results provide new insights into the role of liquidity on firm's capital structure decisions and determine capital structure dynamics. But in this research, the impact of each class of cash flow statement was not investigated. They only examined the liquidity measure. Also, they did not examine non-financial characteristics as an influencing factor.

In addition to the financial characteristics of companies, their non-financial characteristics, such as the characteristics of company managers, also affect the relationship between the speed of adjustment of capital structure and classes of cash flow statement. One, managers who have higher ability in their operational decisions, if they believe that achieving the target leverage will increase the company's value, they will be more active in increasing the companies' leverage towards the target levels. Second, when the capital market correctly assesses management ability, external financing imposes lower financing costs for firms with higher ability managers (Cornaggia et al., 2017). This leads to easier leverage adjustment because firms with more capable managers have lower costs of external financing compared to the benefits of leverage adjustment. On the other hand, it can be hypothesized that managers with higher abilities are more likely to adjust their company's capital structure, and it facilitates a slower adjustment speed compared to target levels for two reasons. First, although higher

managerial ability reduces the costs of external financing, adjusting leverage to target levels may not increase firm value if the costs of external financing exceed the benefits of achieving leverage targets. Previous studies report that many firms adjust their leverage infrequently to avoid transaction costs (Dennis et al., 2014). If high ability managers believe that reducing transaction costs depends on maintaining the current structure, those managers prefer to maintain their current capital structure instead of making a deal. This argument suggests that low-powered managers overestimate the benefits of capital structure adjustments and underestimate transaction costs because they lack sound judgment when making corporate decisions (Demarjian et al., 2013). Therefore, low-powered managers may participate without the need to repeatedly adjust capital structures to desired levels, even if such actions do not maximize firm value. Second, managers who are capable of generating good operating performance may decide not to adjust capital structure based on target levels in order to focus on core activities. Behavioral studies prove that switching between multiple tasks reduces overall performance (Adler & Benbonan-Fich, 2012). Regarding managers' multi-tasking, Olson (2020) reports that managers shift their focus between core and support activities, weakening firm performance. To avoid deteriorating company performance, managers should demonstrate their ability to focus on core activities such as revenue and profit generation rather than spending time and effort on capital structure decisions. Resource-based theory has also recognized the importance of CEO competence as the main source of companies' efficiency and competitiveness (Wu et al., 2017). Their competence depends on the knowledge and skills they learn and accumulate over time. According to the higher ladder theory, the ability of CEOs can be demonstrated by the skills they possess, which are usually measured by their education and experience.

Most studies focus on the characteristics of overconfidence and optimism of corporate managers and how it affects their decisions, including corporate investment, liquidity maintenance, financing, and dividend policies (Chen et al., 2020). Bhuvanendra et al. (2018) and Liao et al. (2015) proved that good corporate governance quality can improve the speed of corporate leverage adjustment using conventional corporate governance variables such as board

independence and institutional shareholder ownership. Dang et al. (2019) proposed new dimensions regarding the pressure of media coverage that helps spread information and acts as monitoring channels that reduce the cost of adjustment. These studies show the importance of disciplinary mechanisms as an incentive to improve the speed of leverage adjustment because it helps to reduce the agency cost between the CEO and shareholders. In fact, theories and empirical evidence support the existence of a relationship between the CEO and the speed of financial leverage adjustment, but consider their performance dependent on the effectiveness of the disciplinary mechanism. This shows that any characteristics of managers that can affect the agency conflict can affect the speed of capital structure adjustment. Therefore, it can be said that achieving the optimal adjustment speed depends on the inherent characteristics of managers. In the behavioral finance literature, it has been determined that corporate managers are overly optimistic and overconfident. Optimism and overconfidence have significant consequences on the decisions of company managers, especially financing decisions (Shefrin, 2018). Overconfident managers show a preference for the customized standard in their financing decisions. In particular, they prefer internal capital to debt and use equity only as a last resort to invest in investment opportunities. Compared to non-overconfident managers, overconfident managers choose higher debt levels and issue fewer shares because they believe their firms' stock is undervalued in the broader market. In other words, overconfident CEOs charge less to issue debt than equity. Because overconfident managers prefer internal cash flows (or risk-free debt) to external financing, overconfident managers' investment is strongly related to the availability of internal cash flows (Aktas et al, 2019). Therefore, the presence of overconfident managers in the company can affect the speed of adjusting its capital structure. Similar findings were obtained by Faulkander et al. (2012), which shows that companies with high operating cash flow perform more leverage adjustments than companies with low operating cash flow.

Dufour et al. (2017) investigated the relationship between cash flow and capital structure adjustment using information from French companies. For companies with excessive leverage, the statistical results showed that the speed of adjusting the leverage

of companies with positive cash flow is higher than the speed of companies with negative cash flow.

Baum et al. (2017), found that companies with financial surplus or debt above the target adjust their debt easily in the presence of small company-specific risk and macroeconomic uncertainty. Organizations that have a financial loss and target their target liabilities change their capital structure easily because all types of risk are small. The predicted speed of adjustments shows that the level at which companies adjust their capital structure based on the goal is affected by both the company's specific risk and economic and financial aspects. In fact, this study found that when firm-specific risk is relatively small, firms shift their leverage more quickly against the target.

Rashid and Mahmood (2017) used firm-level panel data for the period 2000-2013 to analyze the impact of stock market liquidity on the employment decisions of Pakistani firms. They believe that stock market liquidity is significantly and negatively related to firms' debt decisions.

Memon et al. (2020) examines the existence of capital structure dynamics in Pakistan from 2003 to 2012. Using the generalized method of moments (GMM) as an estimation technique, this study confirms the existence of an optimal capital structure for Pakistani non-financial joint stock companies and concludes that depending on the debt profile used, the companies perform full adjustment. . Also, company size, profitability, stock market development and GDP are relatively determinants of the speed of leverage adjustment.

Kamila and Gandakusuma (2021) by examining Indonesian companies in the time period from 2014 to 2018 showed that company-specific factors such as profitability, size, growth and tangibility and corporate governance factors such as board size and family ownership have a significant effect on the speed of financial leverage adjustment. have.

Sri, Damayanti and Kusmawati (2021) analyzed the relationship between cash conversion cycle, financial distress, financial leverage and CEO power. The results showed that the cash conversion cycle has a positive and significant effect on financial helplessness. CEO power has a positive and significant effect on financial distress. Cash conversion cycle has a positive and significant effect on leverage. The cash conversion cycle has a negative effect on leverage. The

cash conversion cycle through leverage has a positive effect on financial helplessness. The power of the executive director through leverage has a negative effect on financial distress.

In their study, Chua et al. (2021) examined the relationship between the CEO's ability and the speed of financial leverage adjustment. Using the information of companies in Indonesia and using the generalized torque model, they showed that the experience and expertise of the CEO has a positive and significant effect on the optimal speed of lever adjustment.

Among the Iranian studies, Soheilyfar et al (2022) investigate the effect of accounting information quality on the relationship between the degree of non-optimality of capital structure and investment inefficiencies of a firm. The results of testing research hypotheses show that there is a positive and significant relationship between the non-optimality of the capital structure and inefficiencies of investment. In this way, the increase in the non-optimality of the capital structure increases inefficiencies of business unit's investments. Also, the findings show that the quality of an accounting information reduces the inefficiencies of investments in the business unit by reducing the non-optimality of capital structure, that is, it actually moderates this relationship. Kamyabi and Maleki Rastaghi (2019) by examining the number of 120 active companies in the Tehran Stock Exchange in the period from 2011 to 2016, showed that the amount of available cash and the financial leverage of the company have an effect on the speed of cash adjustment of companies. And companies that have less than optimal cash and less leverage have a faster cash adjustment speed.

Haghighi Talab et al. (2018) examined the companies listed on the Tehran Stock Exchange in the years 2005 to 2015 and showed that the financing deficit/surplus, concentration and prosperity of the industry separately do not have a significant effect on the speed of adjustment in the capital structure.

The research of Taibi Naqandari and Abbaszadeh (2017) showed that the entropy factor of financial statements and the indicators used for it have an inverse relationship with the speed of companies reaching their optimal capital structure.

Valizadeh Larijani and Ezni Eshari (2016) using data related to 149 companies admitted to the Tehran Stock Exchange between 2017 and 2016, investigated

the speed of adjustment of capital structure in the stages of the company's life cycle and the relationship between profitability and capital structure in these stages. they did The results showed that the companies that are in the maturity stage adjust their debt structure more quickly compared to the companies that are in the emergence and growth stages.

Yazdani and Heydarzadeh Henzaei (2015) investigated the relationship between efficiency, corporate governance system and capital structure dynamics in selected samples of 165 companies admitted to the Tehran Stock Exchange from the beginning of 2009 to the end of 2013. The evidence showed that the capital structure had a negative and significant effect on the independent variables of stock return, asset return and company size, and had a positive and significant effect on the variable of expected stock return, as well as on the variables of corporate governance system, asset growth rate, and operating income growth rate. The effect is significant.

Mehrabanpour and Gholam (2015) selected 83 companies as a sample during the years 2005 to 2013 and showed that there is a negative and significant relationship between corporate governance and dynamic capital structure, there is no significant relationship between competition in the product market and dynamic capital structure, and between There is no significant relationship between company adaptation speed and dynamic capital structure.

Abdul Hashemi et al. (2012) using a sample consisting of 115 companies from among the companies admitted to the Tehran Stock Exchange in the period of 2008 to 2010 shows that there is financial leverage in the investigated companies and these companies have relatively fast They move towards the financial lever of their goal. In all the researches done so far, both inside and outside, not all the layers of the flow sheet have been tested. Researchers have tested only cash flow from operations and have used variables such as: growth, size and liquidity, etc. In none of the researches, the characteristic variable of managers has not been considered as a moderating variable. Therefore, according to the material presented, it can be said that the analysis of the role of managers' characteristics in the relationship between the headings of the cash flow statement and the speed of capital structure adjustment can have an impact on conducting future research and helping investors to

make decisions about the future financial status of the company.

### **3- Research methodology**

#### **3-1 Assumptions of the research**

Hypotheses that the current research seeks to investigate:

- 1) Due to the importance of debt capacity in financing, the adjustment speed of companies with high leverage is higher than companies with low leverage.
- 2) The cash flow resulting from operational activities is a moderating factor in the speed of adjustment of the capital structure in companies with high and low optimal leverage.
- 3) The cash flow resulting from investment returns and the interest paid for financing is a moderating factor in the speed of adjustment of the capital structure in companies with high and low leverage.
- 4) Cash flow due to income tax is a moderating factor in the speed of adjustment of capital structure in companies with high and low optimal leverage.
- 5) Cash flow resulting from investment activities is a moderating factor in the speed of adjustment of capital structure in companies with high and low optimal leverage.
- 6) Cash flow from financing activities is a moderating factor in the speed of adjustment of capital structure in companies with high and low leverage.
- 7) The net increase (decrease) in cash is a moderating factor in the speed of capital structure adjustment in companies with high and low leverage.
- 8) The characteristics of CEOs are moderators on the relationship between operational activities and the speed of capital structure adjustment in companies with high and low optimal leverage.
- 9) The characteristics of managing directors are a moderator on the relationship between investment returns and interest paid for financing and the speed of capital structure adjustment in companies with high and low leverage.
- 10) The characteristics of CEOs are moderators on the relationship between income tax and

capital structure adjustment speed in companies with high and low leverage.

- 11) The characteristics of CEOs are moderators on the relationship between investment activities and the speed of adjustment of capital structure in companies with high and low optimal leverage
- 12) The characteristics of CEOs are moderators on the relationship between financing activities and the speed of capital structure adjustment in companies with high and low leverage.
- 13) The characteristics of CEOs are moderators on the relationship between the net increase (decrease) in cash and the speed of capital structure adjustment in companies with high and low leverage.

### 3-2 Variables and how to measure them

**Capital structure:** a special combination of long-term debt and equity that is used to finance a company's operations, or the amount of debt and common stock used to finance the company's assets, and it generally includes the left part of the balance sheet.

**Speed of Capital Structure Adjustment:** The speed of moving towards debt ratios actually indicates the speed of capital structure adjustments, which depends on the cost of leverage adjustment. If these costs do not exist, according to the parallelism theory, there should never be a deviation from the optimal leverage in companies. On the other hand, if these costs are very high, no movement towards the optimal lever can be seen. Here, the speed of companies moving towards optimal debt ratios is defined as the speed of capital structure adjustment.

High leverage companies: There are companies whose real leverage is more than the optimal leverage.

Low leverage companies: There are companies whose actual leverage is less than the optimal leverage.

Company size: Company size is calculated from the natural logarithm of total assets. The way to calculate the company size variable is as follows (Hajiha, Chenari, 2019):

company size (1) = natural logarithm (book value of total assets)

#### Determining the optimal leverage:

First, by using equation (2), the optimal leverage has been calculated to check the adjustment speed:

(2)

$$L_{i,t} = \alpha_0 + \alpha_1 \frac{CF_{i,t-1}}{TA_{i,t}} + \alpha_2 MB_{i,t-1} + \alpha_3 \frac{Dep_{i,t-1}}{TA_{i,t}} + \alpha_4 Size_{i,t-1} + \alpha_5 \frac{FA_{i,t-1}}{TA_{i,t}} + \varepsilon_{i,t}$$

Definition of variables:

L: financial leverage ratio (total liabilities to total assets)

TA: Total assets

CF: Cash flow from operations

MB: Ratio of market value to book value

Dep: depreciation expense

Size: natural logarithm of total assets

FA: tangible fixed assets

In the following, we examine each of the hypotheses using the following models:

#### Basic model:

$$L_{i,t+1} - L_{i,t} = \delta(\hat{L}_{i,t+1} - L_{i,t}) + \varphi_{i,t+1}$$

In this model, the variable means the speed of adjustments.

In order to consider the possibility of asymmetry in the speed of adjustments between the companies above and below the optimal leverage, the equation (4) is satisfied:

$$L_{i,t+1} - L_{i,t} = \delta_1(D_{above})(Dev) + \delta_2(D_{below})(Dev) + \varphi_{i,t+1} \quad (4)$$

$$Dev = \hat{L}_{i,t+1} - L_{i,t} \quad (5)$$

$D_{above}$ : Dummy variable that is 1 if the company is above the optimal leverage and 0 otherwise.

$$\hat{L}_{i,t+1} - L_{i,t} < 0 \quad (6)$$

$D_{below}$ : Dummy variable that is 1 if the company is below the optimal leverage and 0 otherwise.

$$\hat{L}_{i,t+1} - L_{i,t} > 0 \quad (7)$$

$\delta_1$ : Adjustment speed for high leverage companies,

$\delta_2$ : Adjustment speed for low leverage companies

It is expected that if companies pay attention to their debt capacity,  $\delta_1$  will be greater than  $\delta_2$

In this study, each of the second to seventh hypotheses have been examined based on the following model.

Adjusted model taking into account the "operating activities" category of the cash flow statement: (Mohsani Maleki Rastaghi, 2015)

(8)

$$\hat{L}_{i,t+1} - L_{i,t} = \delta_1(Dev\_above) + \delta_2(Dev\_below) + \delta_3(Dev\_above\_CF_0) + \delta_4(Dev\_below\_CF_0) + \varphi_{i,t+1}$$

In the above equation:

Dev\\_above:  $D_{above} * Dev$

Dev\\_below:  $D_{below} * Dev$

Dev\\_above\\_CF<sub>0</sub>:  $D_{above} * Dev * CF$

Dev\\_below\\_CF<sub>0</sub>:  $D_{below} * Dev * CF$

In this study, each of the categories of cash flows is placed separately in the above model instead of CF<sub>0</sub>:

**CFO** is the cash flow from operations that is obtained from the cash flow statement divided by total assets at the end of the period.

**CFR** Activities return on investment and interest paid on financing obtained from the statement of cash flows divided by total assets at the end of the period.

**CFT** is the income tax derived from the cash flow statement divided by total assets at the end of the period.

**CFI** of investing activities obtained from cash flow statement divided by total assets at the end of the period.

**CFF** of financing activities obtained from the cash flow statement divided by total assets at the end of the period.

**CF** is the net increase (decrease) in cash at the end of the period, which is the cash balance at the end of the period minus the cash balance at the beginning of the period divided by the total assets at the end of the period.

Table (1) shows how to measure the research variables.

Table .1. How to measure variables

Measurement method	Sub variable	Variable name	Variable type
<p>The partial capital structure adjustment model is as follows:  <math>L_t - L_{t-1} = \delta(\hat{L}_{i,t} - L_{i,t-1}) + \varphi_{i,t}</math>                      In this model, <math>L_t</math> specifies the actual (observed) leverage ratio and shows how many percent of the gap between the actual leverage and the target leverage level the companies compensate each year.                      To calculate the target leverage, we have:  <math>L = \beta_0 + \beta_1 CF/TA + \beta_2 MB + \beta_3 DEP/TA + \beta_4 Size + \beta_5 FA/TA + \epsilon</math>  <math>L</math>: total debt to total assets, <math>CF</math>: cash flow from operations, <math>TA</math>: total assets, <math>MB</math>: growth opportunities (the ratio of market value to book value), <math>DEP</math>: depreciation expense, <math>Size</math>: company size, <math>FA</math>: tangible fixed assets.                      After calculating the regression coefficients, the target leverage for each company will be calculated by placing the coefficients in the actual values of each variable.                      Model (1) can be adjusted based on the level of difference from the optimal leverage based on an imaginary variable in the form of model (2).  <math>L_{i,t+1} - L_{i,t} = \delta_1(D_{above})(Dev) + \delta_2(D_{below})(Dev) + \varphi_{i,t+1}</math>                      where in:  <math>Dev = \hat{L}_{i,t+1} - L_{i,t}</math>  <math>D_{above} = \begin{cases} 1, Dev &lt; 0 \\ 0, Dev &gt; 0 \end{cases}, D_{below} = \begin{cases} 0, Dev &gt; 0 \\ 1, Dev &lt; 0 \end{cases}</math>                      The parameters and the speed of leverage adjustment are respectively for companies with high leverage and low leverage.</p>	----	Speed of adjustment of financial leverage	Dependent
Net cash from operating activities/total assets of the company	----	Operational activity )CF <sub>o</sub> (	Independent
The sum of the net flow of investment returns + interest paid for financial facilities / total assets of the company	----	Return on investment and financing profit )CF <sub>i</sub> (	
total income tax paid/total assets of the company	----	income tax )CF <sub>t</sub> (	
The sum of the net flow of investment activity/total assets of the company	----	Investment activity )CF <sub>i</sub> (	



Measurement method	Sub variable	Variable name	Variable type
Sum of the net flow of financing activities/total assets of the company	----	Financing activity )CF <sub>F</sub> (	
The ability of the CEO indicates the ability of the CEO to earn money from the available assets. According to Demirjian et al.'s (2012) research, first, the company's efficiency rating is calculated based on data coverage analysis technique. The ability of management is including the disturbances resulting from the estimated regression model for each company-year. The argument of the above method is based on the acquisition of operational efficiency of the company affected by factors other than the characteristics of the company (size, market share, free cash flow and age of the company) due to management ability, which is why it was referred to as disruption (Demirjian et al., 2012). Pattern 1: Enveloping data analysis $FE = \frac{\text{sale}}{\text{Operating costs} + \text{Tangible fixed assets} + \text{Cost of goods sold}}$ Pattern 2: Regression as combined data $FE = \beta_0 + \beta_1 \text{Size} + \beta_2 \text{MS} + \beta_3 \text{FCF} + \beta_4 \text{Age} + \epsilon$ If the remainder of the model is positive, the manager is capable and the value of the variable is equal to 1, otherwise it is equal to 0.	CEO ability )AB(  Characteristics of managers )MC(  <b>Equalize</b>		
CEO overconfidence is calculated based on overinvestment. $\text{Asset\_GR}_{it} = \beta_0 + \beta_1 \text{Sales\_GR}_{it} + \epsilon_{it}$ In the above pattern, Asset_GR represents asset growth and Sales_GR represents sales growth. If the residual of the model is positive, there is overconfidence and the value of the variable is equal to 1, otherwise it is equal to 0.	CEO overconfidence )OC(  Ownership of the CEO )OWN( CEO tenure )TENU(  It shows the number of years of activity of the CEO.		

### 3-3 Society and statistical sample of the research

In the current research, the companies admitted to the Tehran Stock Exchange are considered as the statistical population. A systematic sampling method was used to select a statistical sample and the companies whose financial year ended on March 29 of each year did not exit the stock market during the research period (2008 to 2021), and did not stop trading for more than 3 months; Banks, insurances and investment funds were not part of financial and credit institutions; During the research period, they have cash payments to the shareholders and the information they need was available in the databases, they were selected as the final sample. According to the filter done, 106 companies were selected as a sample in the period from 2008 to 2021.

### 3-4 Data collection tool

Data collection was done using Tehran Stock Exchange databases, including Kodal website and Rahvard Novin software.

## 4- Data analysis, findings and analysis

### 4-1 Descriptive statistics

Descriptive statistics is a set of methods that provide data processing. Descriptive statistics of some research variables for the entire statistical sample are presented in Table 2.

As Table No. 1 shows, the average net cash flow from operations is about 9%, which on average indicates positive cash flows from operations in the sample companies. Also, the average ratio of financial leverage, which is obtained by dividing the sum of liabilities by the sum of assets, is about 64%. The highest amount of financial leverage is related to Farabi Petrochemical Company in 2016, which has accumulated losses and has increased capital in order to exit from Article 141 of the amendment of the Trade Law in 2017 from the revaluation of assets. Also, the average ratio of net fixed assets to total assets was about 22%, which indicates that in the sample companies, on average, about 78% of the company's assets are kept in the form of current assets. Other information related to descriptive statistics is presented in the above table.

**Table.2. Descriptive statistics of some variables**

<i>L</i>	$\frac{FA_{i,t-1}}{TA_{i,t}}$	<i>Size</i> <sub><i>i,t-1</i></sub>	$\frac{DEP_{i,t-1}}{TA_{i,t}}$	<i>MB</i> <sub><i>i,t-1</i></sub>	$\frac{CF_{i,t-1}}{TA_{i,t}}$	Variables
0/641	0/220	13/665	0/021	2/428	0/096	Average
0/644	0/171	13/572	0/014	1/522	0/130	Middle
4/003	2/371	19/313	0/482	108/793	0/945	Maximum
0/045	0/001	9/797	0/000	-35/585	-37/996	Minimum
0/260	0/184	1/478	0/028	5/482	0/998	Standard deviation

**4-2 checking the absence of collinearity**

The variance inflation factor (VIF) was used. The result was less than 10 and no collinearity problem was observed.

**4-3 Final estimation of the model**

In the final estimate, the model is cross-sectionally fitted and the regression coefficients are obtained in Eviews.

**Table.3. Examination of hypotheses 1 to 7**

	Coefficient	standard error	T	Probability of Error	assumptions
Dev_above	0/02	0/0093	2/69	0/007	The first hypothesis
Dev_below	0/05	0/0095	6/22	0/000	
Number of observations: 1484			Significance level of the model: 0/000		
Dev_above	0/02	0/0095	2/09	0/039	The second hypothesis
Dev_below	0/065	0/01	6/35	0/000	
Dev_above_CF <sub>O</sub>	-0/41	0/1	-3/05	0/002	
Dev_below_CF <sub>O</sub>	-0/32	0/2	-1/61	0/108	
Number of observations: 1484			Significance level of the model: 0/000		
Dev_above	0/02	0/0094	2/69	0/007	The third hypothesis
Dev_below	0/05	0/0098	6/13	0/000	
Dev_above_CF <sub>R</sub>	0/002	0/020	0/12	0/901	
Dev_below_CF <sub>R</sub>	0/049	0/166	0/30	0/767	
Number of observations: 1484			Significance level of the model: 0/000		
Dev_above	0/02	0/0093	2/78	0/005	The fourth hypothesis
Dev_below	0/05	0/0095	6/04	0/000	
Dev_above_CF <sub>T</sub>	-0/25	0/167	-1/51	0/132	
Dev_below_CF <sub>T</sub>	0/20	0/902	0/22	0/828	
Number of observations: 1484			Significance level of the model: 0/000		
Dev_above	0/02	0/0094	2/69	0/007	The fifth hypothesis
Dev_below	0/05	0/0096	6/01	0/000	
Dev_above_CF <sub>I</sub>	-0/003	0/028	-0/13	0/899	
Dev_below_CF <sub>I</sub>	0/22	0/34	-0/66	0/509	
Number of observations: 1484			Significance level of the model: 0/000		
Dev_above	0/02	0/0094	2/87	0/004	The sixth hypothesis
Dev_below	0/05	0/0095	6/13	0/000	
Dev_above_CF <sub>F</sub>	0/17	0/11	1/55	0/122	
Dev_below_CF <sub>F</sub>	0/19	0/20	0/95	0/341	
Number of observations: 1484			Significance level of the model: 0/000		
Dev_above	0/02	0/0093	2/69	0/007	The seventh hypothesis
Dev_below	0/05	0/0095	6/22	0/000	
Dev_above_CF	-0/007	0/0282	-0/26	0/799	
Dev_beow_CF	0/14	0/23	0/63	0/532	
Number of observations: 1484			Significance level of the model: 0/000		

**4-4 Checking the assumptions and the results of the hypothesis test**

The results of the investigation of the first hypothesis show that the Dev\_above variable coefficient is smaller than the Dev\_below variable coefficient and it means that the speed of reaching the optimal leverage in companies with low optimal leverage is higher than in companies with high optimal leverage. While according to the theoretical foundations, it was expected that companies with high optimal leverage would adjust their capital structure more quickly due to the importance of future debt capacity.

The results of the second hypothesis show that the cash flow from operations is a moderating factor in the speed of adjustment of the optimal leverage for companies above the optimal leverage, that is, for the companies that are above the optimal leverage, the cash flow from operations is an influential factor for adjusting the capital structure and reaching to the

optimal leverage, while it is not effective for companies that are below the optimal leverage.

The results of the examination of other hypotheses also show that with the entry of cash flows from other classes, in companies with high and low leverage, since the significance level of the variable is more than 5%, no significant relationship has been seen at the 95% confidence level. In other words, only the cash flow from operations has been a moderating factor in the adjustment speed of the capital structure of companies with high optimal leverage.

Examining hypothesis 8 to 13: The characteristics of managing directors are moderators on the relationship between operational activities/investment returns and interest paid for financing/taxes/investment/financing/cash and the speed of capital structure adjustment in companies with high and low optimal leverage.

**Table.4. Examination of hypotheses 8 to 13**

	High level of managers' characteristics		The low level of characteristics of managers		The statistical significance level of Paternoster et al. (1998)	assumptions
	Coefficient	Significance level	Coefficient	Significance level		
Dev_above	0.039310	0/0208	0.022695	0.0151	-	The eighth hypothesis
Dev_below	0.050437	0.0000	0.066949	0.0000	-	
Dev_above_CFo	0.410861	0.0027	-0.398836	0.0005	0.0037	
Dev_below_CFo	-0.337760	0.0914	-0.372026	0/1043	0/0758	
	Significance level of the model: 0/000		Significance level of the model: 0/000			

	High level of managers' characteristics		The low level of characteristics of managers		The statistical significance level of Paternoster et al. (1998)	assumptions
	Coefficient	Significance level	Coefficient	Significance level		
Dev_above	0.014055	0/0005	0/014349	0.0004	-	The ninth hypothesis
Dev_below	0/052384	0/0000	0/087468	0.0001	-	
Dev_above_CFR	0/025103	0/8380	0/004602	0/9435	0.3270	
Dev_below_CFR	0/042046	0/7236	0/075746	0/7733	0.2092	
	Significance level of the model: 0/000		Significance level of the model: 0/000			

	High level of managers' characteristics		The low level of characteristics of managers		The statistical significance level of Paternoster et al. (1998)	assumptions
	Coefficient	Significance level	Coefficient	Significance level		
Dev_above	0.019139	0/0012	0/018860	0/0048	-	The tenth hypothesis
Dev_below	0/057321	0/0000	0/061879	0/0000	-	
Dev_above_CFT	-0/264530	0/1988	-0/23110	0/1543	0/2965	
Dev_below_CFT	0/183217	0/8970	0/216081	0/7734	0/1821	

	High level of managers' characteristics		The low level of characteristics of managers		The statistical significance level of Paternoster et al. (1998)	assumptions
	Coefficient	Significance level	Coefficient	Significance level		
	Significance level of the model: 0/000		Significance level of the model: 0/000			

	High level of managers' characteristics		The low level of characteristics of managers		The statistical significance level of Paternoster et al. (1998)	assumptions
	Coefficient	Significance level	Coefficient	Significance level		
Dev_above	0.024359	0/0002	0/025101	0/0001	-	The eleventh hypothesis
Dev_below	0/051309	0/0000	0/054901	0/000	-	
Dev_above_CFI	-0/00980	0/88625	-0/00239	0/92893	0/1598	
Dev_below_CFI	0/23867	0/54908	0/190421	0/42897	0/1311	
	Significance level of the model: 0/000		Significance level of the model: 0/000			

	High level of managers' characteristics		The low level of characteristics of managers		The statistical significance level of Paternoster et al. (1998)	assumptions
	Coefficient	Significance level	Coefficient	Significance level		
<b>Dev_above</b>	0/023890	0/0061	0/028067	0/0073	-	The twelfth hypothesis
<b>Dev_below</b>	0/058127	0/0001	0/049117	0/0003	-	
<b>Dev_above_CFF</b>	0/212491	0/09307	0/171109	0/13811	0/2411	
<b>Dev_below_CFF</b>	0/20801	0/37235	0/246913	0/26032	0/2948	
	Significance level of the model: 0/000		Significance level of the model: 0/000			

	High level of managers' characteristics		The low level of characteristics of managers		The statistical significance level of Paternoster et al. (1998)	assumptions
	Coefficient	Significance level	Coefficient	Significance level		
Dev_above	0/025397	0/0054	0/021176	0/0066	-	The thirteenth hypothesis
Dev_below	0/051280	0/0000	0/058745	0/0009	-	
Dev_above_CF	-0/093255	0/53222	-0/006892	0/79808	0/3713	
Dev_below_CF	0/162119	0/57235	0/137093	0/46032	0/3890	
	Significance level of the model: 0/000		Significance level of the model: 0/000			

To examine the moderating role of managers' characteristics on the relationship between operational activities and capital structure adjustment speed in companies with high and low optimal leverage, firstly, the sample was divided into two groups of high and low characteristics based on the characteristics of managers, and then for each group separately, the hypothesis model 2 to 8 is tested. Then, to examine the moderating role of managers' characteristics, Paternoster et al.'s (1998) approach has been used. In fact, this approach is used when we want to estimate a

model in two independent statistical samples and check the significance of the difference in the coefficients of an independent variable. (Platoni, 2021). In this approach, after calculating the version of t-Student and Fisher separately and based on a specific formula, the significance of the statistic has been investigated. In general, the significance of Paternoster et al.'s (1998) statistic for each variable indicates the significant difference of that variable in two independent societies.

The results of this statistic are presented in a separate column for each class of the cash flow statement. According to the presented results, it can be concluded that the characteristics of CEOs are a moderator only on the relationship between operational activities and the speed of capital structure adjustment in companies with high leverage. In other words, the characteristics of managers are an effective factor in the speed of capital structure only in companies with high optimal leverage, and in other cases, the results show the non-significance of Paternoster et al.'s (1998) statistics at the 95% level.

## Discussion and conclusions

**First:** Beginning, we divided the companies into two groups based on financial leverage: companies with high leverage and low leverage. Then, by examining the first hypothesis, we want to see if the adjustment speed is higher in companies with high leverage than in companies with low leverage? In other words, is debt capacity effective in financing companies?

Debt capacity is one of the important items in external financing. Some companies need to increase financing in the current period. If the debt capacity is limited, the opportunity cost of debt issuance will be high. For this reason, it is expected that the adjustment speed of companies with high leverage will be higher than companies with low leverage and companies will try to control and reduce the debt ratio. In fact, companies that have real leverage higher than the optimal leverage should adjust their capital structure more quickly so that they can reach the optimal leverage sooner and not face problems in financing. But the results were unexpected. The companies admitted to the Tehran Stock Exchange do not pay much attention to their debt capacity and the adjustment speed is not higher in highly leveraged companies.

This result can be interpreted as the debt ratio is not very important in inflationary conditions, because in any case, receiving facilities is in the company's favor. In inflationary conditions, the equation is reversed. External financing is beneficial to the company because the rate of receiving facilities (external financing) is according to the approval of the Central Bank and is a fixed percentage. This rate does not increase with inflation. So it is always lower than the inflation rate. On the contrary, internal financing imposes more costs on the company because investors

expect to receive a profit higher than the inflation rate to compensate for the decrease in the value of their money.

In a situation where the inflation rate is higher than the facility interest rate, the existence of a high debt ratio is considered a positive sign. In fact, low leverage companies try to get more facilities, so that they can increase the working capital by injecting liquidity and compensate for the decrease in financial power caused by inflation. This makes them move faster towards the optimal lever. For this reason, the results of the research in Iran show that low-leverage companies adjust their capital structure faster and reach optimal leverage sooner than high-leverage companies. This result is different from the results obtained by Bion in 2008 and Jianhu et al. in 2019.

**Second:** It appears that a company with higher liquidity will face lower costs associated with issuing new securities and is therefore more willing to quickly correct any deviation of its actual leverage ratio from its target ratio. In order to verify the correctness of this claim, in the following, by designing and testing the second to seventh hypotheses, a comparative study of cash flow statement classes and the speed of capital structure adjustment has been discussed. Therefore, highly leveraged companies try to increase the cash flow from their operations in order to obtain financing through the issuance of shares. This makes the cash flow resulting from operational activities a moderating factor in the optimal leverage adjustment speed for highly leveraged companies.

**Third:** Recent studies that pay attention to the role of agency conflict in capital structure decisions provide another explanation for why the speed of capital structure adjustment is slower than what the static exchange theory states. They state that achieving managers' private interests in a situation where firms face taxes, liquidity costs, and debt costs leads to managers preferring tax exemption benefits to debt when making financing decisions and achieving an optimal capital structure. As a result, managers create less debt and restructure less often than the shareholders want. In other words, managers on average have a target leverage that is lower than the level desired by shareholders and use a slower capital structure adjustment speed. Considering this, what was discussed in the 8th to 13th hypotheses was to examine whether the characteristics of the managers can moderate the effect of the components of the cash flow

statement on the speed of achieving optimal leverage. The obtained results showed that the characteristics of CEOs are only moderators on the relationship between operational activities and the speed of adjustment of capital structure in highly leveraged companies. In other words, the characteristics of managers are an effective factor in the speed of capital structure only in companies with high optimal leverage, and in other cases, the results show the non-significance of Paternoster et al.'s (1998) statistics at the 95% level.

## 6- Suggestions

### 6-1 Suggestions from research findings

Managers represent investors and are the main decision makers in companies. The behavioral characteristics of CEOs are considered effective on their decisions. Being risk-taking or risk-averse, opportunism, productivity of intellectual capital, experience and ability of managers are among the important behavioral characteristics that affect the manager's decision to adjust the company's capital structure and reach optimal leverage.

Considering that the results show that the cash flow from operational activities is a moderating factor in the speed of adjustment of optimal leverage, and the characteristics of CEOs are a moderating factor only on the relationship between operational activities and the speed of adjustment of capital structure in companies with high optimal leverage. Therefore, the users of financial information are suggested to pay special attention to the characteristics of managers and the cash flow resulting from operational activities.

### 6-2 Suggestions for future research

- 1) Considering the fact that there were companies with long and short life together in the sample of this research, it is suggested to analyze and analyze the subject of the research by separating the companies based on the length of life and compare with the results of this research.
- 2) It is suggested that by separating the companies based on the industry, the subject of the research should be investigated and analyzed and compared with the results of this research.

## 7- Limitations

Despite a lot of effort, we did not manage to find a research that directly deals with the topic of our research. The researches were either about financial leverage and capital structure, or the characteristics of managers or cash balance. In none of them, the classes of the cash flow statement were tested separately, and this made it difficult to prepare a theoretical basis. Also, so far non-financial characteristics (behavioral characteristics) had not been used. Converting these non-financial characteristics to financial and collecting data was very time-consuming.

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