

-RESEARCH ARTICLE-

## ANTECEDENTS TO THE SPEED OF ADJUSTMENT TOWARDS OPTIMAL LEVERAGE: A CASE OF BAGHDAD STOCK EXCHANGE

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### —Abstract—

The main objective of the study is to examine the antecedents to speed of adjustment towards optimal leverage of non-financial firms listed in Baghdad Stock Exchange Iraq. The factors which ascertain the debt of an organization, are under the focus of studies concerned with financial behaviors of a firm. There are three types of factors that determine the corporate debt, these factors are: (i) firm specific factors, (ii) industry specific, (iii) and country specific.

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Although, the firm specific factors are considered crucial in decision making for a capital structure, but the empirical results do not provide a significant deduction for debt decisions. Firm and industry specific determinants were the center of attention for earlier empirical studies. The data of non-financial firms listed on Baghdad stock exchange over the period of 6 years from 2015 to 2020 chosen as final sample. The static and dynamic panel data is used to answer the research questions. The findings of this study suggest that the financial managers avoid using debt if their earnings are not stable and have high amount of cash available. Firms having high growth in assets are using more debt in Iraq. Results of this study are largely consistent with the available empirical findings from other countries and are explained by the existing theories of capital structure. In answering the first question of the adjustment speed of Iraqi firms towards target debt, the study finds that the speed depends upon the proxy of debt used. Given this finding, financial managers may reevaluate the decision of using debt to finance their growth, as it might lead to bankruptcy. Since the findings of this study are based on the historical data, the managers can rethink on the factors they have been considering in the past in making adjustment towards target debt and using the level of debt. They can reconsider their past choices and justify that their choices have maximized the value of the firm.

**Keywords:** Adjustment speed, Capital structure, optimal leverage, Iraq

**JEL Classification:** G2, G22

## 1. BACKGROUND

Abeywardhana (2017) conducted a study on the concept of optimal capital structure, his study got the attention of many other researchers and scholars. In the conclusion of his research Abeywardhana (2017) discusses the theorem of capital structure irrelevance which was presented by Modigliani and Miller. According to this theorem the capital structure is irrelevant while discussing the value of the company. In other words, value of a company is not affected by the debt and equity proportions. They contemplated the corporate taxes, 5 years later of proposing the irrelevant theory, and because of the Tax-deductible interest expense, they supported the 100% utilization of debt in capital structure of an organization. Modigliani and Miller's concepts were extended by Korkmaz & Erkol (2021). They put forth both sides of debt utilization in a capital structure; benefits of using debt and how superfluous usage of debt leads to bankruptcy costs and thus, an optimal capital structure was advocated by them. Owing to these arguments, various studies were conducted on this issue by developed economies and extended these works in bringing out new theories by contemplating the optimal capital structure. Market Timing theory, Tradeoff theory, Dynamic trade-off theory, pecking order theory and Agency theory are some of the important theories relevant to the optimal capital structure. The developed countries provided the empirical evidences to formulate these theories, but there is a need to study the implications of the designed theories from the perspective of developing economies as they are different in their

economical, legal and institutional systems from the developed economies (Sahudin et al., 2019).

The center of attention was subsequently transformed from firm specific to firm specific and country specific altogether in order to find out the contextual variations for capital structure determining factors. Vishny & Zingales (2017) conducted a study on the factors determining the corporate debt and their work has been widely cited across different countries of the world. They asserted that the capital structure of the firm is impacted by similar firm specific factors in the United States as well as in the intergovernmental organization of G-7 countries. It has been suggested that the tax rate, size of the firm and difference in countries lead to report the variations in capital structure. Two of the studies of Gherghina, Vintilă, & Toader (2020) examine those factors which assist in determining the capital structure and presents the fact that the capital structure determinants of developing economies possess the similar impact as of developed economies; irrespective of the variations present in the institutional factors. It was examined by Sahudin et al., (2019) that the decisions made regarding corporate debt were non-identical in 4 of the countries; which are Thailand, Malaysia, Singapore and Australia along with the fact that no similarity was found in capital structures either. Mai (2019) suggest that among 42 countries, there was an influence of firm specific factors and country specific factors on the decisions taken on debt and the variables were significantly varied. The research contribution of Abbas & Masood (2020), Cappa et al., (2020), Trejo et al., (2021), Feda (2020), Chadha & Seth (2021), Daskalakis et al., (2017), Hussain et al., (2018), and Robiatun & Witiastuti (2021) is highly significant in this regard.

In some studies, target capital structure has been focused along with the factors determining adjustment speed regarding target capital structure and approximation of adjustment speed with respect to target capital structure. To comprehend the dynamism of these factors which determine the capital structure, the conduction of research in this regard is still lacking from the perspective of the developing economies like Iraq. Therefore, factors influencing the adjustment speed regarding target capital, estimating the adjustment speed regarding capital structure and the target capital determinants are focused on this study about context of Iraq. In last 50 years, capital structure is widely studied in the field of corporate finance. The eagerness and the rate of conduction of studies on capital structure has been increasing despite of studying this area from last 50 years, as the 10 percent of the research conducted in last 3 years are linked with the queries on capital structure which have been published in the top tier journals. This pace shows that the finance scholars are fascinated towards this area and find it interesting for research due to the uncertainty regarding the findings relevant to the factors impacting corporate debt financing behaviors and its effectiveness in developing economies as well as developed economies. Mixed and uncertain findings are reported by Sahudin et al., (2019) regarding the factors determining the optimal leverage. It has been suggested by

Rahman (2019) that complications in decision making for capital structure are not defined by a sole theory. Jain & Karmakar (2018) also found out the uncertainty and inconsistency in the results relevant to the decision making for capital structure (Haron, 2018). The empirical studies focusing the dynamic aspects of capital structure, estimating the adjustment speed with respect to target and factors affecting the speed of adjustment are still deficient. Particularly, the studies in the context of Iraq are insufficient. The studies conducted by Mai (2019), Haron (2018), Hussain et al., (2018), and Ahsan & Qureshi (2017), were conducted from the perspective of developing economies. Iraq is also considered through the selected samples of these studies, yet these researchers are unable to claim their findings over debt determinants, adjustment speed, and factors affecting adjustment speed regarding target debt ratios for Iraq.

## 2. Hypothesis

The capital structure of a firm comprises of the debt, short term and long term, capital and preferred stock and common equity to run financial operations and to maintain new financial projects. In other words, the combination of debt and equity is referred as the capital structure which is intended to invest in business activities. Capital structure is defined by Albart et al., (2020) as the “association of long-term debt and equity for the purpose of financing”. The main aim of decision making for capital structure is to determine the level of debt (leverage) or incorporation of that capital structure which helps to reduce the weighted average cost of capital (WACC) and is directed for value maximization. When the value of the firm is maximum and the WACC is minimum, that point is referred as the optimal capital structure (Kartika, Sunarto, & Rahman, 2020). WACC can be reduced by using the leverage in two ways. (1) A fixed interest payment, lower than the cost equity, is received by the debt holders. The equity holders do not get a fixed return. To avoid situation of bankruptcy, the firm is obliged to pay the interest payments. The firm is not obliged to pay dividends to the equity holders. Thus, using the debt has less risk as compared to use the equity thus, lower interest is charged. (2) Taxable income is reduced because the payment of the interest on debt is exhibited as an expense in the income statement. Thus, the payable tax amount is reduced which is beneficial for the company. Due to this phenomenon, the value of the firm is maximized and WACC is decreased. Debt is not beneficial all the time. The benefits and losses, both can be enhanced due to the debt. The firm performance can be highly influenced due to the use of debt in certain situations. A firm can be declared bankrupt, if it relies heavily on debt and is incapable of meeting the requirements of debt payment. Bankruptcy is the major threat to the firm using debt structure. A firm is prone to bankruptcy if that firm is highly reliable on the debt. Due the competitive nature of the industries, debt structure cannot be proved certain all the time.

Arguments are presented by both of the studies conducted by Trejo et al., (2021) and Chadha & Seth (2021). They are of the view that if the fixed cost (e.g., legal fees and investment banking fees) is incorporated in the total cost of transforming the capital

structure, there will be no transformation in the capital structure of the firm and they will be incompetent for adjusting to their target leverage ratios. If there is larger gap between the company and its targeted capital structure, the adjusting speed would be higher. Hence, it can be deduced that there is a positive relationship of the distance between the company and its target capital structure with the speed of adjustment. It has been demonstrated by this positive coefficient of variable that cost of one-time restructuring is lesser than the slow and persistent adjustment cost (Hussain et al., 2020). Another point of view suggests that these two variables share the negative relationship between them. Referring to this point of view it can be said that, the firms which are not lagging behind from their target are capable of achieving it fast so that no cost of transaction would likely to incur (Robiatun & Witiastuti, 2021). These firms do not need to have a transaction in the external market rather they can alter the dividend payout ratio. Moradi & Paulet (2019) and Trejo et al., (2021) are in the favor of this argument. Moradi & Paulet (2019) and Robiatun & Witiastuti (2021) are advocating the negative relationship shared by these variables. Hussain et al., (2020), Memon et al., (2020) and Chadha & Seth (2021) provide the empirically proven suggestions that the argument on a higher cost would be incurred while transforming the capital structure is advocated by the positivity of the relationship between speed of adjustment and distance construct. Moradi & Paulet (2019) and Robiatun & Witiastuti (2021) advise for a quick transformation in the case if firm has less distance, so they are likely to support the negative relationship between speed of adjustment and distance. Warmana et al., (2020) are also in favor of the negative relationship of distance with adjustment speed of one measure debt with respect to 9 countries in Africa.

For developing the change in capital structure, companies are likely to decrease their activities of repurchasing and issuance if there is a higher proportion of total fixed cost (Robiatun & Witiastuti, 2021). If a larger distance prevails in the real and target debt, the organization is likely to move to target debt ratio and cost incurred is expected to be lower than the advantages which have been attained. Chadha & Seth (2021) and Hussain et al., (2020) endorse that the speed of adjustment and distance between the observed and target debt share a significantly supported positive relationship. Whereas, Trejo et al., (2021) have evaluated that there is a weak relationship between these two constructs. The suggested fact that the distance and adjustment speed hold a negative relationship is dependent upon the argument that is the distance is lesser, target can be attained through retained earnings. Robiatun & Witiastuti (2021) and Moradi & Paulet (2019) conducted the empirical studies that proved the negative relationship between adjustment speed and distance from the target. Thus, on the basis of arguments presented by Moradi & Paulet (2019), Hussain et al., (2020), Chadha & Seth (2021), and Robiatun & Witiastuti (2021) it can be proposed that:

*H1: There is a relationship Distance between observed and optimal leverage and speed of adjustment towards OL.*

Low cost of changing capital is incurred in larger firms and it is considerably fixed; thus, they possess a good pace to attain their debt targets (Chadha & Seth, 2021). Public is capable to get the details and particulars of the larger firms due to the coverage of high-level analysts, ultimately through which the access to debt and equity markets is greater for them (Trejo et al., 2021). So it can be deduced that the adjustment to target for larger firms is easier; therefore, it shares a positive relationship with the adjustment speed. Chernenko (2019) asserts that a negative relationship is likely to occur between these two constructs. As suggested by Chernenko (2019), Smaller firms are more likely to get lending facility from the banks because the conservative lending policies of the banking system do not let the bank expose to a risk occurred from higher and frequent lending to the larger firms. Larger firms have to bear a lower cost of getting far away from the target in contrast to the smaller firms, this argument also supports the negative relationship between the size of the firms and adjustment speed (Canarella & Miller, 2019); this behavior is due to the lower volatility in cash flows in larger firms, through which the potential cost of distress is decreased (Fedra, 2020). According to the arguments of Amin et al., (2020), the adjustment in regard to the target becomes less fascinating due to lower potential cost of distress; therefore, the speed of adjustment for the larger firm is lessened. Moradi & Paulet (2019), Memon et al., (2020), Robiatun & Witiastuti (2021), and others, conducted the empirical research in order to develop the significantly positive relationship between speed and target debt by advocating the logic of access to the firm information in case of the larger firms and incurring of the lower cost for transforming the capital structure. Hussain et al., (2018) and Wahid et al., (2018) determined the significantly negative relationship showing that in case of smaller firms, the cost of moving away from the target is lower (Canarella & Miller, 2019) and it is easy for them to have a lending relation with the institutions (Chernenko, 2019).

The organizations need to incur a higher cost to change its capital structure; thus, in contrast to the smaller firms, larger corporations would face less difficulty in changing their capital structure. Larger firms can go to capital markets with a great ease due to good assistance from high-ranking analysts (Trejo et al., 2021). Hence, it can be concluded that there is a positive relationship between adjustment speed with respect to optimal debt and size of the corporation. Memon et al., (2020), Robiatun & Witiastuti (2021) and Chadha & Seth (2021) evaluated the positive relationship between these two constructs in their studies, asserting on the point that smaller firms bear higher adjustment cost as compared to the larger firms. However, Wahid et al., (2017) have found out that there is a negative relationship between the firm size and adjustment speed toward the optimal debt. Thus, it can be proposed in the light of empirical evidence that:

*H2: There is a relationship between Size of the firm and speed of adjustment towards OL.*

There are various sources for a firm to generate finances if the growth opportunities are higher and thus, those opportunities can be utilized to make a higher growth by generating a sufficient and frequent capital. By issuing the securities to adjust according to the target, a growing firm can make itself capable of changing its capital structure. There is a lesser probability for the firms having slow growth for changing their capital structures and in order to adjust itself with the target, it would only be capable of switching debt with equity and vice versa (Chadha & Seth, 2021). Due to these practices, value of a firm gets minimized by the presence of asymmetric information (Trejo et al., 2021). The value remains maximized for the firms experiencing higher growth because of the greater opportunities to be exploited, irrespective of the asymmetric information. According to the arguments presented by Sutomo (2020), the value of the growing firms possess a variation, making it more risky and incompetent to generate the sufficient capital even in the favorable conditions. Hence, the negative relationship of speed and growth is developed. Trejo et al., (2021), Chadha & Seth (2021), Hussain et al., (2018) and some others proved the positive relationship between growth of the firms and adjustment speed through their empirical studies. Their studies suggest that those firm with a higher growth rate can openly chose a favorable method of financing and they can also generate their capital frequently. Sardo & Serrasqueiro (2017) and Wahid et al., (2017) evaluate the negative relationship between these two constructs on the basis of high risk involved in these practices.

Growing corporations bear restricted funds which makes them capable enough to generate capital to meet their requirements. These companies are advised to utilize those financing options which are beneficial in taking them to their targets (Memon et al., 2020). Hence, it shows that there is a positive relationship between the growth of firm and adjustment of speed regarding the optimal debt. Chadha & Seth (2021) discovered a significant relationship between these two variables. The positive relationship occurs in the conditions of the books and a negative relationship prevails in the conditions of market. Trejo et al., (2021) and Hussain et al., (2018) suggest that the growth and adjustment speed share a positive linkage between them. According to the findings of Sardo & Serrasqueiro (2017) there is negative relationship between adjustment speed and growth. On the basis of evaluations of Sardo & Serrasqueiro (2017), Chadha & Seth (2021), and Trejo et al., (2021), it can be proposed that;

*H3: There is a positive relationship between Firms' growth rate and adjustment speed towards optimal leverage.*

It can be expected that there is a positive linkage between the profitability level and the adjustment speed towards the optimal leverage. According to the rationale of Hermassi

et al., (2017), internal sources of finance are more likely to be utilized by the firms as compared to the external sources and due to the higher access to the internal funding sources, the profitability gets increased which may lead to the higher adjustment of speed with regard to optimal debt. Amin et al., (2020) suggest that the speed of adjustment is impacted by the cut back in cost of external financing due to free cash flows from profitability. It has been further extended by Amin et al., (2020) that firms which are more profitable can make flexible financing decisions and are charged with lower rates on their securities which lead to the less cost of adjustment. It has been reported by Robiatun & Witiastuti (2021) that profitability and adjustment speed share a direct relationship which supports the finding of Hermassi et al., (2017) as demonstrated in the index section 2.16. Contrary to these arguments, Sardo & Serrasqueiro (2017) and Hussain et al., (2018) assert that profitability holds a significantly negative impact on adjustment speed. These researchers are little in number who focused the profitability as a factor determining the speed of adjustment. As there are more contradictory findings, the relationship between these variables needs more attention for the exploration.

As the internal sources of funds are readily available, the profitable firms are more likely to make adjustments towards their target capital structure (Robiatun & Witiastuti, 2021). There is a positive association between the speed of adjustment in regard with the target and the rate of profitability due to the reduced costs of adjustments as the internal funding sources are easily available. The results of Sardo & Serrasqueiro (2017) and Hussain et al., (2018), show a contradiction, that they find a negative association between the speed of adjustment towards the target and profitability. According to the findings of Robiatun & Witiastuti (2021) it has been reported that these two constructs share the positive relationship between them. On the basis of the empirical evidences provided by Sardo & Serrasqueiro (2017), Hussain et al., (2018), and Robiatun & Witiastuti (2021) it can be proposed that:

*H4: There is a relationship between Profitability and speed of adjustment towards OL.*

Moradi & Paulet (2019) are of the view that the adjustment speed with respect to optimal debt is also influenced by some of the economic indicators such as economic conditions, money supply, and interest rates. By keeping their argument in view it can be inferred that if the economic conditions are favorable, a firm can easily achieve its targets regarding leverage as compared to adverse situations of the economy (Hussain et al., 2020). Trejo et al., (2021) argue that the economic conditions are the drivers for speed of adjustment in Swiss corporations. Yang et al., (2021) and Yildiz (2018) are of the view that in favorable economic situations, the adjustment cost in regard to the target should be lower. According to Daskalakis et al., (2017), it is highly dependent on the economic state of the area that how much possibility of the firm is regarding its losses or being default. Linking GDP growth with the economic conditions, as the GDP growth rate rises, the speed of adjustment towards the target also rises. Wahid et al., (2017) suggest that there are more investments, where the economy is in growing phase

entailing the demand for external financing sources. So, there must be prevailing change in the capital structure. As per the findings of Varvara & Anastasia (2020), the association between adjustment speed and GDP growth rate can prove to be a sample unit for the developed economies. Yang et al., (2021) asserted that instead of adjustment cost, an economy shows market imperfections and macroeconomic conditions, moreover, it has also been suggested that there is a significant positive association between these two constructs and issuance along with the repurchase practices.

In the light of the above-mentioned arguments, it can be assumed that if the economic conditions are favorable, there is an assistance in moving towards optimal level. Good economic situations posit lower cost of adjustment (Yildiz, 2018). Varvara & Anastasia (2020) found out in a sample unit of developed economies, that there is a significant relationship between GDP growth rate and speed of adjustment toward the optimal debt. Hussain et al., (2020) and Wahid et al., (2017) affirm that out of 10, 3 countries show the significant relationship of these variables while one country shows a significantly negative relationship. In a similar manner, Yang (2021) have also affirmed the significant association between GDP growth rate and Speed of adjustment toward optimal leverage. According to the presented arguments, it can be proposed that;

*H5: There is a relationship between GDP growth rate and speed of adjustment towards OL.*

It can be expected that there is a positive relationship between increased rate of taxes and speed of adjustment towards the optimal leverage according to the Trade-off theory Varvara & Anastasia (2020) as the corporations are motivated to take tax-debt benefits (Tax shield) by deploying a sub optimal level of debt. Hussain et al., (2018) argued that it becomes easier for the firms to move towards their target optimal debt ratio because of the shielding effect of taxes. It has been advised to those firms which are not using debt as a major portion of their capital structure, that they should take the benefit to tax shield so that they can move fast to attain the debt targets. Tax rate is focused by very less studies to examine the influence on speed adjustment. According to the report of Varvara & Anastasia (2020), also demonstrated in index section 2.18, the firms in developing economies, are taken as a sample unit which do not take tax benefits, could experience the significant impact of tax rates on the speed of adjustment toward optimal debt level. Kamran et al., (2016) affirms that there is a direct linkage of effective rate of taxes with adjustment speed. On the basis of above mentioned arguments, it can be concluded that, firms can move fast towards their target because of lower debt as the firms possess unused debt tax shield. Hussain et al., (2018) argue that there is a negative association between the two variables.

The development of positive relationship between the adjustment speed and higher tax rates is demonstrated by the logic that the value of target attainment gets higher due to the increase in the benefit of using debt. Kamran et al., (2016) state that a positive

association between effective tax rate and speed of adjustment towards optimal level has been observed. The study conducted by Varvara & Anastasia (2020) posits the significantly positive relationship between speed of adjustment and effective tax rate in case of developing economies and developed economies show a negative association between these constructs. Warmana et al., (2020) also demonstrate the positive relationship. It can be proposed on the basis of above discussed arguments that;

*H6: There is a relationship between Effective tax rate and the speed of adjustment towards OL.*

In the markets of developed countries, lower cost is incurred in the generation of external capital, due to which the establishment and development of financial market keeps a significant effect on the adjustment speed toward optimal leverage; thus, resulting in the reduced cost of recapitalization (Warmana et al., 2020). It is indicated by Smaoui et al., (2017) that because of one financial market development in the developing economies, overall supply of the capital gets enhanced, whereas, composition of supply of capital incorporates certain changes in the case of developed economies. Varvara & Anastasia (2020) discuss that there is a significant influence of financial market development of adjustment speed as it is a crucial determinant in this case. Warmana et al., (2020) discuss for the two measures of debt, that development of financial market holds a negative influence on speed of adjustment toward optimal debt level, but they report a positive relationship in the case of on measure of debt. There is a lack of studies for exploring the relationship between these two constructs, thus there is a need of further research to be conducted in this area.

According to the arguments made by Smaoui et al., (2017), with respect to developing economies, the capital supply is enhanced through the development of stock markets. Yet this determinant is not explored. Varvara & Anastasia (2020) suggested that it is to be considered that the development of stock market proves to be an important driver for the adjustment of speed about optimal level of leverage. Reporting of Warmana et al., (2020) affirms the effect on speed adjustment held by the establishment of stock markets as dependent upon the leverage measure. Hence, it can be proposed on the basis of mentioned empirical evidences that;

*H7: There is a relationship between Stock market development and speed of adjustment towards OL.*

Speed of adjustment is expected to be influenced by the interest rates fluctuating in the market. Adjustment speed may get to be lowered if the interest rates in the market are higher. The adjustment speed toward the target may be fostered through the comparatively lower rates of interest. Memon et al., (2020) affirm that organizations are more likely to focus on interest rates (Lower) if they are to be issuing the debt. Therefore,

it can be predicted that there is a negative association between these two variables: rate of interest and adjustment speed toward the target.

Financial recapitalization is dependent upon rate of interests. In accordance with the provisions of Memon et al., (2020) it can be stated that the adjustment speed and rate of interest share a negative relationship. Hussain et al., (2020) incorporated a sample of 10 countries from which one country showed a negatively significant relationship between these two constructs. Thus, it has been proposed in the light of above-mentioned arguments that;

*H8: There is a relationship between Interest rates and speed of adjustment towards OL.*

### 3. Model Specifications

For purpose of determining the impact of adjustment cost and to examine the optimal debt in case of firms operating in Iraq, this study incorporates dynamic panel data estimation model. By adhering to the ways of Murtaza & Azam (2019), Trejo et al., (2021), Chadha & Seth (2021), and Robiatun & Witiastuti (2021), present study incorporates the partial adjustment model because it observes target debt ratio (TD) as the linear function of other explanatory determinants which have been focused in earlier studies conducted on capital structure. Equation 1 demonstrates it as the following;

$$TDB_{it} = f(V_{it}, V_i, V_t) \dots \dots \dots 1$$

$$TDB_{it} = \sum_{i=1}^n \beta_k V_{kit} + U_{it} \dots \dots \dots 2$$

$TDB_{it}$  indicates the target debt ratio where  $i$  indicates the firm and  $t$  indicates the time, a firm's vector and target debt ratio's time variant exploratory factors are indicated by  $V_{it}$ . Country specific, time specific and unobservable firm specific effects are indicated by  $V_i$  and  $V_t$  which are similar while moving from firm to firm and might vary with the time. The association can be explicated as, the firms would give a quick response if there is no adjustment cost and due to variations in explanatory factors, firms would likely to get adjust with their target debt ratio. Thus, the target debt of the firm ( $TD_{it}$ ) must be equal to the observed debt ( $OD_{it}$ ) which can be shown as  $TDB_{it}=OD_{it}$  and hence, corporations must be at target debt. Therefore, it can be concluded that the change a firm aims to reach to target at time (t) should be equal to the change in observed debt from before present period. It has been indicated that

$$OD_{it} - OD_{it-1} = \delta_{it}(TDB_{it} - OD_{it-1}) \dots \dots \dots 3$$

$$OD_{it} = OD_{it-1} + \delta_{it}(TDB_{it} - OD_{it-1}) \dots \dots \dots 4$$

$$OD_{it} = OD_{it-1} + \delta_{it}TDB_{it} - \delta_{it}OD_{it-1} \dots \dots \dots 5$$

$$OD_{it} = (1 - \delta_{it})OD_{it-1} + \delta_{it}\left(\sum_{k=1}^n \beta_k V_{kit} + U_{it}\right) \dots \dots \dots 6$$

Due to the prevalence of adjustment cost, firms cannot adjust their actual debt with the target debt completely. In other words, it can be said that rather than being fully adjusted, the firms would become partially adjusted to the target debt and there will be no equality in the observed and target debt. Equation (3) through equation (6) demonstrates the partial adjustment model.

As in the present study, target debt ( $TDB_{it}$ ), depends on the firm specific determinants such as; size ( $SIZE$ ), tangibility ( $tan$ ), profitability ( $Prof$ ), growth ( $Growth$ ), earning volatility ( $TANG$ ), tax rate ( $TAXR$ ) and non-debt tax shield ( $NDTXSH$ ), cash ( $CASH$ ), and industry specific factor such as industry median leverage ( $IML$ ), and country specific factors such as stock market development ( $SMD$ ), GDP growth rate ( $GDP$ ), and interest rate ( $INTR$ ), Thus the equation (7) demonstrates that:

$$OD_{it} = (1 - \delta_{it})OD_{it-1} + \delta_{it}(\alpha_1 Prof_{it} + \alpha_2 SIZE_{it} + \alpha_3 Growth_{it} + \alpha_4 TANG_{it} + \alpha_5 ERVOL_{it} + \alpha_6 NDTXSH_{it} + \alpha_7 TAXR_{it} + \alpha_8 CASH_{it} + \alpha_9 IML_{it} + \alpha_{10} GDP_{it} + \alpha_{11} INTR_{it} + \alpha_{12} SMD_{it} + U_{it} \dots \dots \dots 7$$

Where, non-debt tax shield ( $NDTXSH$ ), cash ( $CASH$ ), tangibility ( $TANG$ ), industry median leverage ( $IML$ ), earning volatility ( $ERVOL$ ) are control variables.

Referring to equation (7), coefficient of adjustment or speed of adjustment are shown as the coefficient  $\delta_{it}$ . It explains that how much adjustment is needed between two time-periods or observed debt ( $OD_{it}$ ) to its target debt ( $TDB_{it}$ ) convergence rate.  $|\delta_{it}| < 1$  which is a condition that  $OD_{it} \rightarrow TDB_{it}$  as  $t \rightarrow \infty$ , this limitation function exhibits the effect of adjustment cost. The is an absolute adjustment made in 1 period and the debt level of the firm is considered as optimal at time (t) if  $\delta_{it}$  shows the value equal to 1. The value of  $\delta_{it}$  is different for different companies and it gets differ for the same company with the passage of time. If the value of  $\delta_{it}$  is 1 in each span of time, it can be comprehended that firm is at its target level. The adjustment of previous period (t-1) to the current period (t) is not up to the mark of required target adjustment, if  $\delta_{it}$  becomes less than 1. It can be comprehended that a company is making excessive adjustments

than the required adjustments to reach to the target but had not achieved the target yet if the value of  $\delta_{it}$  happens to be greater than 1. A greater value of  $\delta_{it}$  indicates that the speed of adjustment toward target leverage is higher because  $\delta_{it}$  represents the amount of adjustment.

Relying on the studies of Cappa et al., (2020), Chadha & Seth (2021), and Robiatun & Witiastuti (2021), it is suggested that estimation of a dynamic model demonstrated in Equation (7) is tested using difference of Roodman (2018). Adjustment speed was tested through Generalized Method of Moments (GMM) and it also assisted in recognizing the factors that hold impact on target debt. As the companies adjust according to the targets, the target debt ratio is not externally measured in this model, but the target debt ratio is viewed as the linear function of the determinants of optimal debt which has been exhibited in equation (2). Extension has been given to this model and it turns the adjustment speed as endogenous towards optimal leverage. An assumption has been developed that  $\delta_{it}$  varied with the passage of time, additionally, it serves as a constant term and as a linear function of few of the preset explanatory variables as equation (8) has exhibited.

$$\delta_{it} = \alpha_0 + \alpha_k X_{it} \dots \dots \dots 8$$

Adjustment speed has a determinant variable which is shown as  $X_{it}$ , has associations with the country, firm or is associated with the macroeconomic factors of a country. The dimensions of  $X_{it}$  demonstrated in equation (8), are time series as well as cross sectional if there is an employment of firm related factors of adjustment speed. The subscript  $it$  will be changed to  $t$  in  $X_{it}$ , as it is not a firm specific factor if the factor related to another country or macroeconomic specified factors are employed as factors determining adjustment speed. Following model will be obtained after rewriting if we would exchange the equation (3) values with equation (2) and equation (8) values

$$OD_{it} = (1 - \alpha_0 - \alpha_k X_{it}) OD_{it-1} + (\alpha_0 + \alpha_k X_{it}) (\sum_{i=1}^n \beta_k V_{kit} + U_{it}) \dots 9$$

U it is considered as a statistical error having zero mean and a constant variance. Considering that panel data would be deployed for developing the estimates and simplifying the equation (9), the following model is obtained in accordance with out estimations.

#### 4. Data Sources

The financial statements of the corporations were examined which include Income statement, statement of cash flows and balance sheet so that the required data of the firms could be obtained in accordance with the variable. Thomson Reuters' financial database DataStream is considered as the main source of accessing this type of data. DataStream is utilized so that the required firm specific data can be obtained through it to reassure the certainty. DataStream is extensively employed database for capital structure based studies. Cappa et al., (2020), Murtaza & Azam (2019), Memon et al., (2020), Varvara & Anastasia (2020), and Robiatun & Witiastuti (2021) are among some of them. Both information regarding the market value of equity of a company and the firm's accounting data is accessible through DataStream data base. To categorize the industries, the classification data is also available at DataStream database. World Bank's World Development Indicators (WDIs) are being employed for country specific variables such as macroeconomic variables.

Both data has been gathered for evaluation of this study including panel data (time series) and cross-section, as it encompasses all the details and data relevant to all the variables for the sample firms of Iraq ranging the tenure of 2011-2020. As there is higher degree of freedom and large number of observations in panel data, it is superior to the cross-sectional. Multicollinearity issues are being reduced using panel data and better estimation with greater efficiency comes up from this type of data. Various researches focusing the dynamism of capital structure such as Cappa et al., (2020), Trejo et al., (2021), Chadha & Seth (2021), and Robiatun & Witiastuti (2021) come up with the utilization of panel data.

#### 5. Estimation Methodology

For estimation of partial adjustment model, various empirical studies have incorporated varied techniques, equation (9) demonstrated the technique for estimation of adjustment speed and the factors determining the optimal debt and equation (14) has been indicating the for factors holding impacts on adjustment speed. Kannadhasan et al., (2018) and Feda (2020) employed Ordinary least square (OLS) and fixed effect regression respectively. Because the right-hand side of the model comprises of lagged dependent variable (ODit-1), it can be observed that OLS is biased (equation 9 and equation 14). As function of the firm fixed effects (ui) encompass debt, thus, the lagged dependent variable and error term will remain correlated; Therefore, in OLS, there will be an underestimation of the speed and overestimation of coefficient of lagged dependent variable (Memon et al., 2020).

In the similar manner, biasness is also found in fixed effect estimation because the within firm transformation (diverging observations from their individual cross section means) is employed in it, to get rid of the impacts given by the individual cross sections. According to the statements, although, firm fixed effect is eliminated through the

transformation, yet the correlation gets increased between the transformed error term and transformed dependent variable. Therefore, in fixed effect estimation, the coefficient of the lagged dependent variable (leverage) happens to be completely biased downwards and there would be an overestimation of speed regarding target debt (Memon et al., 2020).

Three standard diagnostic tests have been deployed in the present study for investigating those issues which GMM estimation might result in. Joint significance of the coefficients was tested by deploying F-test, validity of instruments was examined by deploying Hansen J-Statistic, and autocorrelation of the residuals were tested by using AR2. All the coefficients of the variables determining target debt are equal to zero; this is categorized as Null hypothesis of F-test. For this test, the p-value should be smaller. To examine the validity of employed instruments, Hansen J-Statistic is used. The employed instruments are exogenous; this is categorized as the Null hypothesis of Hansen J-Statistic. Thus, the p-value for this test should be higher. For testing the autocorrelation (at level 2), Roodman (2018) second autocorrelation test (AR2) was employed. At level 2, there is no serial correlation between the error terms; this is categorized as the Null hypothesis for this test. Thus, for the acceptance of this null hypothesis, the p-value should be higher. The dynamic model is specified as follows:

$$y_{it} = \alpha_1 y_{it-1} + \alpha_2 x_{it} + \alpha_3 w_{it} + \varepsilon_{i,t} \dots\dots\dots (10)$$

$$\varepsilon_{i,t} = U_i + V_{i,t} \dots\dots\dots (11)$$

## 6. Results

We started our analysis by testing the stationarity of our variables. To make sure that our variables are stationary and to avoid any spurious regressions, we ran the panel Fisher type unit root test using the Philipps perron method on all our variables. The results indicate that the variables are stationary at levels. We used the Fisher-type unit root test that applies the Augmented Ducky Fuller (ADF) test on each of the cross-sections and reports combined p-values from the panel-specific unit-root tests using the four methods as proposed by. Three of the methods use the transformation of p-values by inverse  $\chi^2$ , inverse-normal, or inverse-logit, while the fourth is the modification of the inverse  $\chi^2$  transformation that is usually used when N tends to be infinity. The null hypothesis of the test is that all the panels contain a unit root. The results imply a rejection of the null hypothesis and confirm the stationarity of the variables at levels. The test's null hypothesis is that all the panels contain a unit root. We test different lag lengths in the test specification; however, the significant results have not changed. The summary statistics is shown in the Table 1

**Table 1: Descriptive Analysis**

Variable	Obs.	Mean	Std. Dev.	Min	Max
<i>OD</i>	372	0.3769211	0.257062	0.0063327	1.7988130
<i>TANG</i>	473	.0738539	.0430503	0.0023131	0.6195135
<i>SIZE</i>	473	20.53497	2.433262	16.504353	27.8464
<i>PROF</i>	473	0.0185505	0.0186968	-0.0413331	0.1121318
<i>GROWTH</i>	473	0.6753433	2.5866600	0.0005322	24.369740
<i>ERVOL</i>	473	0.0403301	0.0630648	0.0145894	0.7429054
<i>NDTXSH</i>	473	0.6420857	0.1642445	0.0206659	0.9492560
<i>TAXR</i>	473	0.0911335	0.1045013	0.0456170	0.9310000
<i>CASH</i>	473	0.0291833	0.0266189	0.0016638	0.1465053
<i>IML</i>	473	14.373201	6.242420	1.600000	42.860000
<i>RGDP</i>	473	5.512319	1.368280	3.396000	8.1540000
<i>SMD</i>	473	22.983173	2.140380	4.350000	48.7500000
<i>INTR</i>	473	14.4072516	0.0942727	6.250000	24.6600000

Table 2 presents the Pearson correlation coefficients to measure the strength of relationships between the independent variables in this study. Table 2 shows that none of the correlation coefficients between the independent variables are higher than 0. 80. A benchmark of 0.8 level of correlation is used to detect the existence of multicollinearity as suggested by Gujarati & Porter (2009). The correlation matrix reports no signs of multicollinearity within any of the variables. We ran Pearson’s correlation matrix for all the variables to detect collinearity that exceeds 80%. We found only 2 variables that are highly collinear i.e., loan ratio and liquidity. We dropped loan ratio from our variables list to avoid any model misspecification (Gujarati & Porter, 2009).

For the selection of the most appropriate estimates, we used several diagnostic tests (see Table 3). First, the White Heteroscedasticity test was used to capture the heteroscedasticity issues in our aggregate model. The results of the test indicate that in our aggregate model, the null hypothesis is rejected at the 5 percent significance level where the p-value is between 0.0000 and 0.0020.

**Table 2: Correlation**

<b>Variables</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>
<i>OD</i>	1	1											
<i>TANG</i>	2	0.1361	1.00										
<i>SIZE</i>	3	-0.1090	0.3088	1.00									
<i>PROF</i>	4	0.1569	0.0104	-0.4533	1.00								
<i>GROWTH</i>	5	0.0139	0.2107	0.2195	-0.1154	1.00							
<i>ERVOL</i>	6	0.0425	-0.2254	-0.0501	-0.0552	-0.1007	1.00						
<i>NDTXSH</i>	7	0.1043	0.4154	0.8120	-0.3091	0.2643	-0.1191	1.00					
<i>TAXR</i>	8	0.1668	0.2305	0.1793	-0.0247	0.4181	-0.1009	0.2714	1.00				
<i>CASH</i>	9	0.3935	-0.1411	-0.5783	0.6582	-0.0537	0.1482	-0.3682	-0.0179	1.00			
<i>IML</i>	10	0.0686	-0.1560	-0.0412	0.0181	0.2783	-0.0848	0.0325	0.4126	0.1431	1.00		
<i>RGDP</i>	11	-0.1117	0.1172	0.0280	-0.0846	-0.1574	-0.0975	-0.0400	-0.2554	0.1301	-0.6649	1.00	
<i>SMD</i>	12	0.1325	0.3069	0.1295	0.0797	0.1309	-0.1603	0.2413	0.2464	0.0257	0.3043	-0.2616	
<i>INTR</i>	13	0.2638	0.3444	0.1208	0.0350	0.0982	-0.1171	0.2379	0.1754	-0.0262	0.0437	0.0924	1.00

This indicates that there is a problem of heteroscedasticity in the aggregate pooled model and the use of random effect estimates is hence recommended. The Breusch Pagan LM test was used to decide between the pooled OLS and random effects estimations (Breusch & Pagan, 1979). The test examines if the pooled OLS method yields a BLUE estimator that is free from autocorrelation, meaning that the cross-sections' specific term is equal to zero. LM uses the Chi square distribution with one degree of freedom under the null hypothesis. When the calculated value exceeds the tabulated chi-square, null hypothesis was rejected, and it was concluded that the cross-section individual effects were present and consequently the random effects model was the preferred methodology.

**Table 3: Results of the Diagnostic test**

Statistics	Breusch and Pagan test/ autocorrelation test	White Heteroscedasticity test	Hausman test	Arrelano-Bond Test
Prob>chi2 Prob>z	0.0000	0.0000**	0.0023**	0.751

The LM test results in Table (1) postulates that the random effects model is preferred over the pooled OLS. The next step is to choose between the fixed and random effects model. In this regard, the Hausman specification test was used to compare the fixed effect estimator  $\mu_1$  with the random effect estimator  $\mu_2$ . The null hypothesis is that estimator  $\mu_2$  is an efficient and unbiased estimator of the true parameters. If this is the case, there should be no systematic difference between the two estimators. The results in Table 4.5 imply the rejection of the null hypothesis and that the fixed effects model is favored. The Arellano-Bond test for zero autocorrelation was estimated in the GMM analysis of the work which is reflected in the following table. Cross-sectional dependence for each model was tested by using the Pearson test. The test results show that cross-sectional dependence exists between the cross-sections. With balanced panel datasets, we can use the Feasible Generalised Least Squares (FGLS) and the Panel Corrected Standard Error (PCSE). But since our panel datasets are unbalanced, we used the robust and clustering option after every model. We clustered the data across banks (De Hoyos & Sarafidis, 2006).

If our GMM model is an identified model, then there is only one instrument per each endogenous variable. In this case, we cannot test for the over-identification restrictions as our model is an identified model and incorporates only one instrument for each of the endogenous variables. Accordingly, diagnostic tests are reported post-GMM estimation

which defines the validity of these instruments via the autocorrelation tests (Arrelano-Bond Test). Similarly, the results of the Arrelano-Bond Test rejected the presence of autocorrelation. Thus, the fixed effect and GMM estimates appear to be the most appropriate estimates for the aggregate model. First, what is the adjustment speed of Iraqi firms towards target capital structure? Second, what is the relationship between firms' optimal debt ratio and firms' profitability, tangibility, growth, tax rates, earning volatility, non-debt tax shield, cash flows, size, industry median leverage, and country specific variables of GDP growth rate, interest rates, and stock market development in Iraq Third, what is the relationship between adjustment speed towards optimal capital structure and firms' growth, size, profitability, tax rates, distance between target and observed leverage, GDP, stock market performance, and interest rate in Iraq. Results of this study are largely consistent with the available empirical findings from other countries and are explained by the existing theories of capital structure.

**Table 4: Regression Results**

	Fixed Affect	Difference GMM
$OD_{t-1}$	-	0.2656*
$TANG * OD_{t-1}$	-0.2121***	-0.2227***
$SIZE * OD_{t-1}$	0.3211**	0.5230***
$PROF * OD_{t-1}$	0.4131	0.2757
$GROWTH * OD_{t-1}$	0.4312**	0.3362***
$ERVOL * OD_{t-1}$	0.4231***	0.9339***
$NDTXSH * OD_{t-1}$	0.4921**	0.2330**
$TAXR * OD_{t-1}$	0.2343**	0.2338**
$CASH * OD_{t-1}$	0.2723*	0.3330***
$IML * OD_{t-1}$	0.2343**	0.4540***
$RGDP * OD_{t-1}$	0.1223	0.3640
$SMD * OD_{t-1}$	0.1651**	0.1738**
$INTR * OD_{t-1}$	0.1431**	0.1724**
R-square	0.789	

In answering the first question of the adjustment speed of Iraqi firms towards target debt, the study finds that the speed depends upon the proxy of debt used. The higher speed depends upon the lowness of lagged dependent variables coefficients. Taking long term debt as dependent variable, the coefficient of lagged dependent variable is highlighted as 0.449 and is proved to have a 5% significance level. Among Pakistani firms, the presence of target capital structure is assured by the lagged dependent variable's significance and partial movement is made to that target by them. The presence of transaction cost is the responsible factor for the partial movement towards target. Adjustment speed is a concern of how the leverage is measured, this is assured by the

range of speed of adjustment. It has been concluded by that the results are varies if there is employment of different techniques with same measure of leverage and deployment of a same technique with the different measures of leverage used.

## 7. Discussion and Conclusion

The range of adjustment speed confirms that the adjustment speed is a function of how we measure the leverage. study also report the high adjustment speed range for nine developing countries of Africa. So far as the second question of the impact of firm specific, industry, and country specific factors on target leverage is concerned, the results are again justified by several previous studies and the theories of the capital structure. They put forth the argument that the country specific factors hold a crucial importance for comprehending the factors determining capital structure. A comparatively new theory emerged because of the provided arguments, Dynamic Trade-off Theory, suggesting that every organization holds a target debt ratio and the observed debt ratios are not coincided with the target debt ratios all the time. The organizations prefer a particular speed to achieve their target debt ratio. It has also been observed that firm specific factors are likely to affect the speed of a firm, which might include size of a firm, profitability ratio, gap between the target and observed leverage, along with the country specific factors which might encompass the rates of interest, development in stock and Bond markets, rate of growth in GDP etc. (Chadha & Seth, 2021; Hussain et al., 2018; Robiatun & Witiastuti, 2021; Trejo et al., 2021; Varvara & Anastasia, 2020). Corporations can maintain their capital structures immediately with respect to their optimal debt ratios if no adjustment cost is incurred but if the adjustment cost is incurred, their adjustment to capital structure remains partial (Chadha & Seth, 2021). Recent empirical studies are now certainly paying attention to the establishment of dynamic models which prefer the separate study of both observed and target debt ratios as effectiveness of optimal capital structure has been realized due to the prevailing adjustment cost concept. Tangibility has consistently positive significant impact on leverage across all measures of leverage. Growth is insignificant in determining the corporate leverage across all measures except quasi market measure of leverage, where it has positive significant impact. Firms' profitability, size, and tax are found insignificant across all proxies of leverage. The corporate managers in Iraq would comprehend this study in a crucial manner for developing the understanding of those crucial factors which influence the decisions relevant to financing, especially concerned with the adjustment speed towards target debt and debt levels. As the historical data is the base for the results of this study, the managers can modify their ways of dealing with the adjustment towards target debt and using the level of debt that they were using earlier. The managers are advised to compare their earlier choices and give grounds for their decisions. It has been suggested through the findings of the present study that the managers are supposed to avoid the usage of debt if there is an uncertainty in their income and cash is remained stacked. In Iraq, those firms which are having higher

growth rate deploy more debt in their capital structure. In accordance with it, it is advised to the finance managers that they should reconsider the thought of financing the growth by using debt, which may be a source of bankruptcy.

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