



Investigating the Impact of Market Timing on the Capital Structure of the Selected Companies in Tehran Stock Market

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Abstract

Based on the theory of market timing in the framework of capital structure, the time of issuing stock depends on the stock prices. This way, managers issue shares that have a high ratio of market value to book value. In fact, issuing shares is in the best interest of the firm when the company's stock in the market is more than its actual value.

In this paper, by using panel data of 55 firms listed in Tehran Stock Market between 2003 and 2018, we investigate the impact of market timing on the capital structure. The estimated model in this paper is a partial dynamic model using Generalized Method of Moment (GMM) and Arrelano-Band Estimates. The findings indicate that 1: market timing affects the firm's capital structure of Tehran Stock Exchange. 2: market condition has a significantly negative effect on the capital structure which means that in hot markets, managers issue more equity and less debt. 3: firm size and tangible assets have significantly positive effects on leverage ratio. In fact, larger firms with more tangible assets face lower default risks, thus they have relatively more debt. 4: profitability variable influences corporate leverage negatively. 5: sanction and exchange rate variables have negatively significant effects on the capital structure.

Highlights

- Based on market timing theory, companies increase their capital when the market value is more than the booked value.
- Testing the market timing theory and measuring the impact of sanction and exchange rate on the capital structure are our aims in this paper.
- There is an inverse relationship between the ratio of market-to-book and corporate leverage.
- The exchange rate has a negative influence on the capital structure as same as sanction.

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1. Introduction

The main goal of companies is to maximize shareholder's wealth. The most important factor to achieve this target is the capital structure of the company, which requires the optimal utilization of financial resources and the achievement of the proper return of the investment. Companies utilize different financing methods; each method can have different effects on the firms' performance. Irrelevance theory of capital structure on the firm's performance implies that under certain circumstances, capital structure does not influence the firm's performance. This theory had a great impact on the theoretical developments and the process of corporate finance research.

Following [Modigliani and Miller \(1958,1963\)](#), who for the first time, studied the relationship between capital structure and the firm performance under the Theory of Irrelevance, [Jensen and Mackling \(1976\)](#), taking a different approach, investigated the capital structure within the framework of Agency Theory. Subsequently, there has been a large volume of literature on the manager's tendencies and preferences and the cost of representing from their behavior which introduced the choice of appropriate capital structure as a way to control representing the cost of behavior of managers.

In recent years, Market Timing Theory has been expressed by [Baker and Wurgler \(2002\)](#). Based on market timing theory, which is one of the latest theories on capital structure, companies increase their capital when the market value is more than the booked value. Conversely, they tend to finance through borrowing when the market value is underpriced. Therefore, one of the most serious issues raised in the financial literature is whether market timing influences the capital structure.

Therefore, market timing is crucial because of its significant effect on the capital structure. Considering this theory, managers can make appropriate decisions on the method of financing because they are more aware of the right time to issue shares. In addition, it improves shareholder's ability to understand the manager's financing decisions effectively. Our aim in this study is to investigate the effects of market timing emphasizing the initial public offerings on the capital structure of selected companies in Tehran Stock Market.

The purpose of this paper is to fill three research gaps in the literature of capital structure in Iran. Gap 1: testing the market timing theory which has received less attention by Iranian researchers. Gap 2: estimating how sanctions would affect the structure of capital that is theoretically expected to have a negative effect on the leverage ratio due to increasing political and economic risks. Gap 3: measuring the impact of exchange rate on the capital structure which is theoretically predicted to have a negative effect on the leverage ratio. It seems that taking into account the impact of economic sanctions against Iran and the undeniable increase in the exchange rate (leading to deepening and increasing the macroeconomic risks) would provide a better picture of the factors determining the capital structure of companies.

This article is organized under 6 main sections. Following the introduction, the second and third parts will be dedicated to theoretical framework and the review of related literature, in which classical and modern theories will be described, and the most important findings of previous research will be presented. Methodology and data analysis will form the subject of the fourth section of this paper. In the fifth section, the estimation of the model and in the last part, the conclusion will be presented.

2. Theoretical Framework of Capital Structure

Theories of capital structure emerged as a response to Modigliani and Miler's Irrelevance Theorem (MM). According to this theorem, capital structure has no significant effect on the firm value (Pandey & Ghotigeat, 2004 and Khazaei et al., 2017). The theory was based on some contextual assumptions, such as a perfect capital market, no taxes, no bankruptcy costs, no costs of information asymmetries and no transaction costs.

To better understand this theory, it is assumed that a proportional income tax is applied to firm's income denoted by " τ ". If the firm finances itself through issuing equity, it can focus on the firm's net income as a starting point for obtaining the unlevered firm's market value:

$$EBIT(1 - \tau) \quad (1)$$

Determining the cash flow of a firm would be possible by adding the depreciation (Dep). According to this hypothesis, the equivalence of firm's investment (I) with amortization would mean that a firm would not make more investment than amortization. Therefore, the firm's free cash flow (FCF_U) will then be:

$$FCF_U = EBIT(1 - \tau) + Dep - I = EBIT(1 - \tau) \quad (2)$$

This result indicates that considering cash flows as perpetuities, FCF_U is equal to the firm's EBIT after taxes. If this company's capital cost is denoted as k_0 , the present value of firm will be:

$$V_U = \frac{FCF_U}{k_0} = \frac{EBIT(1 - \tau)}{k_0} \quad (3)$$

If the firm finances itself through both issuance of equity and debt, identifying the remuneration of both bondholders and shareholders is necessary to estimate the levered firm's market value. To obtain the first group's cash flow, the net profit (NP) must be added to the depreciation, and the investment deducted from it, while the second group's cash flow consists of the interest rate of bond (k_d). Therefore, the levered firm's total cash flow will be:

$$FCF_L = NP + Dep - I + k_d D = (EBIT - k_d D)(1 - \tau) + Dep - I + k_d D$$

$$FCF_L = EBIT(1 - \tau) + \tau k_d D \quad (4)$$

The unlevered company generates the cash flow shown in the first addendum of equation (4). It is assumed that both firms (unlevered and levered) deal with the same risk for this component, as a result, they face the same capital costs (k_0). Using debt has the advantage of the tax shield illustrated in the second addendum

of equation (4). As long as the firm's profits remain constant over years, it is possible to assume that the tax shield has the same risk as bonds' interest rate (k_d). The present value of levered firm will then be:

$$V_L = \frac{EBIT(1 - \tau)}{k_0} + \frac{\tau k_d D}{k_d} = \frac{EBIT(1 - \tau)}{k_0} + \tau D$$

$$V_L = V_U + \tau D \quad (5)$$

The value of levered company is equal to the value of unlevered company plus the tax shield's present value. It should be noted that according to the original theory of MM, there is neither market imperfection, nor taxes ($\tau = 0$), so the original MM theory states that (Laureando, 2011):

$$V_L = V_U \quad (6)$$

The aforementioned assumptions have been the topic of much debate leading to a surge of research on alternative theoretical framework, where there are incentives for managers and shareholders to make decisions on the level of leverage to obtain an optimal capital structure. While there is no universally accepted theory on the choice of capital structure, three most famous ones are the trade-off theory, pecking order theory and market timing theory (Frank & Goyal, 2009).

- **Trade-off Theory:** Trade-off holds that market imperfections lead to positive effects on the firm, and that there is a desired level of capital structure, reached through the balance of debt and equity where costs of debt (particularly bankruptcy) should be offset by its benefits (mainly the tax shield). In other words, determining the optimal amount of debt that ensures the maximization of firm's market value requires combining and balancing the costs of bankruptcy and the tax shield. Based on the trade-off theory, the company's total value is equal to the summation of unlevered firm's value and present value of tax benefits minus the present value of the bankruptcy.

$$V_L = V_U + PV(\text{tax shield}) - PV(\text{bankruptcy costs}) \quad (7)$$

Formula (7) shows that firms tend to increase debt to take advantage of the tax shield deriving from it; however, higher debt ratio may lead to higher probability of insolvency and bankruptcy.

- **Pecking Order Theory:** In contrast to trade-off theory, pecking order theory does not assume an optimal capital structure. Based on this theory, firms can finance themselves with three sources including issuance of equity, increasing debt and accumulated undistributed profits. Considering this theory, firms should opt for three financing options based on the implied risk of adverse selection (Myers & Majluf, 1984). As such, retained earnings will always be the most favorable while debt will be used as a last resort (Frank & Goyal, 2009). In a study by Joeveer (2013) on transition economies, it is argued that countries with low transparency have a higher degree of pecking-order style financing compared to economies that are more transparent. This is because of the high degree of mispricing of alternative financing instruments due to information asymmetries (Joeveer, 2013).

- **Market Timing Theory:** In recent years, the academic literature has focused on market timing as a relatively old idea. According to this theory, firms have incentives for the issuance of equity following price run-up. [Lucas and McDonald \(1990\)](#) investigated a dynamic model of adverse selection combining some components of pecking order theory and market timing theory. The results of their study indicate pre-issue following price run-up. In addition, [Baker and Wurlger \(2002\)](#) demonstrate that capital structure is best understood as the cumulative effect of past attempts to market timing ([Baker & Wurlger, 2002](#)).

2.1 Determinants of Corporate Leverage and Theoretical Predictions

Regarding the existing empirical and theoretical literature, a list of factors affecting the capital structure is extracted. This list includes measures of profitability, size, tangible properties, stock market conditions (hot or cold market) and market-to-book value in which the last two are derived from market timing theory. In addition, the exchange rate and sanctions have been added to the list of variables affecting the corporate capital structure due to Iran's special circumstances during the research period. Making judgment on the link between the theory and data is necessary to investigate the theorem. While judgment does not seem to be controversial, there is considerable disagreement in some cases.

- **Leverage and Profitability:** The expected costs of financial distress for profitable companies are much lower than that for others, so such firms find the benefits of the tax shield more valuable. Thus, balancing the costs of insolvency and tax shield's benefits may lead to profitable companies prioritizing more debt. However, based on the latest articles, the predictions of trade-off theory are more complex than perspectives on static models (See [Strebulaev, 2007](#)). Based on dynamic version of trade-off theory, there is a negative relationship between leverage and profitability due to some frictions (see [Kayhan & Titman, 2007](#)). According to the theoretical predictions of the pecking order theory, companies prefer internal funds to external finance. Consequently, profitable companies will tend to have less leverage ratio.

- **Leverage and Size:** Larger and more diversified companies deal with lower default risks. Based on the trade-off theory, larger companies tend to use more debt. Against the predictions of the trade-off theory, the pecking order theory anticipates a negative relation between the size and leverage. ([Pandey & Ghotigeat, 2004](#)).

- **Leverage and Tangible Assets:** Determining the value of tangible assets is easier for outsiders than intangible properties; this reduces the expected costs of distress. In addition, substituting high-risk properties for low-risk assets is difficult for shareholders. Therefore, the combination of lower expected distress costs and fewer debt-related agency problems makes a prediction of a positive relation between leverage ratio and tangible assets; this is while opposite perspectives can be extracted from the pecking order theory. Based on the aforementioned theory and in the absence of high asymmetric information, tangible properties make issuances of equity less costly. Accordingly, higher

tangibility results in lower leverage. However, in the case of existing adverse selection, more tangibility leads to an increase in the adverse selection and debt pick-up. This uncertainty under the pecking order theory can emanate from the fact that tangibility can be considered as a criterion for different economic forces (Frank & Goyal, 2009).

- **Leverage and Stock Market Condition (Hot or Cold Market):** One of the measures of market timing is cold or hot market of equity issuance. More favorable market conditions result in more equity issuance; that is while in cold markets, issuers keep their equity issues to a necessary minimum. Therefore, if market conditions influence the issuance of equity, it is likely to diminish debt. (Alti, 2006)

- **Leverage and Market-to-Book Value:** In the trade-off theory as one of the proxies of risk, investment opportunities and some other factors affecting the optimal ratio of leverage is the market-to-book parameter. Based on the predictions of this theory, transitory volatilities in market-to-book value lead to transitory effects. Nevertheless, according to the pecking order theory, managers entirely avoid equity issues because of the adverse selection. In dynamic model, avoiding equity issues in the future may result in reducing leverage by companies with upcoming investment; whereas, the standard version of this theory indicates that high investment periods will push leverage higher towards a debt capacity. According to market timing theory, irrational investors and lower equity costs encourage managers to raise equity. Market-to-book ratio has a negative effect on the leverage when the market-to-book ratio variation is an indicator for the managers' understandings of misevaluation (Baker & Wurgler, 2002).

- **Leverage and Exchange Rate:** The results of Frank and Goyal (2003) research indicate that internal determinants can explain only 30 percent of corporate leverage differences, and other factors have significant impacts on the corporate capital structure. Hackbarth et al., (2006) have concluded that macroeconomic conditions would play an important role in determining optimal leverage ratio (Tehrani & Najafzadekhome, 2015). Higher exchange rates lead to higher business risks via increasing volatility of input prices and consequently decreasing the operating income of company and increasing its probability of insolvency. In appointing the optimal corporate leverage and trade-off theory, increasing firm's business risk, due to rising exchange rate, has a negative effect on the corporate leverage.

- **Leverage and Sanction:** aiming at bringing a change into a specific behavior or policy, one country, some countries or an international organization impose coercive measures against another country or a group (Folch, 2010). Iran has been under comprehensive unilateral economic sanctions intensified since 2012 by some groups of countries (Kokabisaghi, 2018). Following the imposition of sanctions on Iran, macroeconomic instability increased, and the operational risks of companies soared particularly due to the rising import costs of intermediate commodities and the deteriorating outlook for export revenue. Regarding trade-off theory, higher risk is likely to increase financial distress, and

thus corporate leverage is inversely related to the risk. However, it is demonstrated that for an inverse relationship between risk and leverage ratios, insolvency costs should be quite large (Pandey & Ghotigeat, 2004).

3. Literature Review

In the model provided by Lucas and McDonald (1990), it is assumed that companies issue shares after experiencing an unusual increase in stock prices. Moreover, managers time stock markets based on private information related to the company's future value, and time debt markets based on public information such as extra predictable yields of bonds. If managers do not have more general information than investors when timing a debt market, the timing strategy cannot create any value. In addition, corporate executives may schedule debt markets based on private information related to the corporate credit rating. Managers may be in a better position than investors with better information about the future corporate credit ratings. In this case, when managers expect the company's credit rating to improve coming periods, they will issue short-term debt and otherwise issue long-term debt securities.

Baker and Wulger (2002) traced the effects of equity market timing on corporate leverage. The market-to-book value is utilized as a proxy of market timing in the aforementioned paper. They found that market value fluctuations play a pivotal role in determining corporate leverage; the effects last for at least a decade.

Using the data of all companies that had been in the initial public offering during the period 1971-1979, Alti (2006) investigated the effects of market timing on the company's capital structure. He believed that the initial public offering was the most important financial event in the life cycle of a company. Investors face uncertainty and a high degree of asymmetric information when investing in an Initial Public Offering (IPO). Therefore, it is possible to make a mistake in the process of initial public offering that provides a good context for market timing.

Alti (2006) outlined a monthly moving average graph of the volume of IPOs and introduced a dummy variable as market conditions (HOT). If firms were public in months when the volume of public offering was above average, the hot market variable would be one, or otherwise zero. He believes that the main variable of the market timing measure is HOT. By estimating a Fixed Effect model, Alti (2006) concluded that companies active in hot market would issue more shares than in cold market. However, after initial public offering, companies would increase their leverage ratios through borrowings. At the end of the second year, after the initial public offering, the timing effect on leverage disappears completely. Alti (2006) showed that the effects of market timing on the capital structure are not permanent, and this finding is inconsistent with Baker and Wurgler's (2002) result.

Many researchers have investigated the relation between leverage ratio and firm-level factors; they have used almost the same set of determinants. Mokhova and Zinecker (2014), Jõeveer (2013), Camara (2012), Bokpin (2009), Frank and

Goyal (2003 & 2009) and Hatzinikolaou et al. (2002) have found that corporate leverage is affected by macroeconomic variables including the fluctuation of GDP, inflation and exchange rate. For instance, Camara (2012) investigated the effects of exchange rate on the market value of company and its stock price. It is taken for granted that the variations of exchange rate have a considerable effect on the company's cash flow. In addition, the macroeconomic conditions play a significant role in determining the company's growth opportunity and financial performance. Moreover, GDP fluctuations influence leverage and profitability through influencing company's insolvency. According to Bhattacharjee et al. (2014), macroeconomic conditions particularly fluctuations in macroeconomic variables have a significant impact on the insolvency of the US and UK firms. Baum et al. (2006) revealed that the ability of management to anticipate firm specific information including future cash would obstruct higher uncertainty. Their findings indicate that increasing macroeconomic uncertainty leads to hampering the efficient use of resources. They also revealed that three groups of companies are more affected by macroeconomic uncertainty than other firms including "firms experiencing rapid growth", "firms that are more financially constrained" and "firms with high intensity of capital".

Several studies have focused on the capital structure in Iran especially over the past two decades. A series of studies such as Khaleghi Moghaddam and Baghomian (2006) and Karami et al. (2017) described the theories of the capital structure and the difference between them without any empirical tests. The second group of the research focused on examining the effects of capital structure on other variables such as corporate size, dividends, capital efficiency, unusual stock returns, and systematic risks. In contrast to this category, some researchers have also investigated factors affecting capital structure (profitability opportunities, firm size, liquidity, collateralized assets, corporate governance variables, tangible assets, financial flexibility, inflation rate, etc.). For example, the results of Alipour et al.'s (2015) paper indicate that corporate leverage is influenced by the growth opportunity, size of the firm, state ownership, structure of the properties, liquidity, profitability and financial flexibility (Alipour et al., 2015). Studies such as Haghghat and Bashiri (2012), Sheeri Anaqizand et al. (2015), Pourzamani et al. (2010), Khademi and Zamanlu (2015) and Noruzi and Moti (2013) are in this category. However, studies such as Ramsheh et al. (2017), Kordistani and Pirdavari (2012), Khani et al. (2013), and Sheikh Ahmadian et al. (2016) specifically emphasize the capital structure theories.

In addition, Tehrani and Najafzadehkhoe (2015) considered the influence of exchange rate, inflation and GDP on the leverage ratio of 186 firms listed in Tehran Stock Exchange. The results of their paper indicate that exchange rate and inflation uncertainty have negative effects on the Leverage.

With a review of the present studies, despite the fact that the effects of market timing and capital structure in the world are noticed, this issue has been neglected in Iran. Accordingly, the present study attempts to fill this gap. Based on previous studies, internal and external determinants play an important role in the optimal

corporate capital structure. For this reason, we tried to extend the literature on the effects of intensifying sanction and increasing exchange rate on the capital structure of Iranian firms.

4. Data and Methodology

4.1 Data Base

The data required for this study is from the annual reports and financial statements (profit and loss statements and balance sheet) of the companies in Tehran Stock Exchange market during 2003-2018 using the Rahavard Novin software. All companies whose information is available for this period and has the following features are included in this study as below:

1. Companies should have an initial public offering during the period examined.
2. Triple financial statements, including the balance sheet, profit and loss statement, and the cash flows of these companies should be available within the specified time.
3. The end of the fiscal year of these companies should be Esfand 29th. In fact, all financial statements must be prepared for the period from 1/1 to 29/12, otherwise the company will be removed from the list of selected companies.
4. Companies should be non-financial corporations. That is, banks, investment funds, and other financial companies are removed from the list of selected companies. The reason for this is that capital structures are usually different in these companies. In fact, some legal requirements can affect the capital structure of the companies and consequently make the results inaccurate and biased. Finally, the data of this paper is a balanced panel of 55 companies operating in 18 industries.

The exchange rate growth is calculated based on the data available from the Iranian Central Bank website. The dummy variable of sanction is considered zero or one. Due to imposing new sanctions against Iran by the United States, the UN and European Union, the dummy variable is considered one for 2010 to 2012 and zero for other years.

4.2 Unit Root Test

Investigating panel-unit root test is the first step for our estimation. For this step, we employ the Levin, Lin and Chu (LLC).

The summary result of panel-unit root test is represented in Table 1. The null hypothesis (H_0) of LLC test is non-stationary of variable. So, based on the results, H_0 is rejected and all variables are stationary.

Table 1. Panel unit root test results

Variables	Unadjusted t	Adjusted t	p-value
D/A	-12.0624	-4.5488	0.0000
M/B	-14.7457	-7.3156	0.0000
EBITD	-12.9431	-5.1430	0.0000
SIZE	-14.6613	-11.5920	0.0000
PPE	-11.4986	-4.8149	0.0000
Growth of Exchange Rate	-14.4492	-8.8097	0.0000

Source: Research findings

4.3 Model and Estimation Method

In order to investigate the effects of market timing on the capital structure of firms in Tehran Stock Exchange market, the following equation is estimated using the generalized method of moments (GMM):

$$\begin{aligned} (D/A)_t = & \text{HOT} + (M/B)_t + (EBITDA/A)_t + (PPE/A)_t + \text{SIZE}_t + \text{SANCTION} \\ & + \text{EXCHANGE} + (D/A)_{t-1} + \varepsilon_t \end{aligned}$$

In the above equation, Book debt, D, is defined as total liabilities, D/A represents the ratio of book debt to total assets. Market-to-book ratio, M/B is book debt plus market equity divided by total assets as a criterion for measuring market timing (as in [Baker and Wurgler \(2002\)](#)).

Profitability is measured by EBITDA/A which is earnings before interest and taxes. PPE/A is defined as net plant, property and equipment. SIZE is the logarithm of total assets. Sanction is a dummy variable and Exchange shows the exchange rate.

In this research, the monthly market value is used to demonstrate the hot and cold markets. This way, the moving average of the market value is plotted during the time of the study. If the market value of that year is higher than the average market value in the given period, the market is hot and vice versa. Hot years receive number "one" and cold years have "zero" numbers.

In the estimation of equations with unobservable effects of each cross sections and the existence of dependent variable with a lag on the left side of the equation, GMM estimator is utilized. In addition, the GMM is used when the number of cross-sectional variables (N) is greater than the number of times (T). It is worth noting that this method is referred to by differential first-order GMM. Since the number of samples (N=55) is more than the period (T=15), this method is used in this study.

The consistency of the GMM estimators depends on the validity of the tools used, which can be an inappropriate estimator by choosing the correct instrument variables and applying a weighted variance and covariance matrix. To verify the validity of moment limitation and instruments used, Sargan Test introduced by Arrelano and Band, Arrelano, Bover and Blundell and band is used ([Baltagi, 2008](#)).

An important point to consider in the GMM model is that the number of observations is large enough to achieve robust results. In such a way, the inadequacy of the number of observations may lead to inaccuracy and biased results and make it difficult to interpret (Bond, 2002).

5. Results

The estimation results are presented in Table 2.

Table 2. The results of model estimation

variables	Symbol	Coefficient	t-Statistics	prob
Laggedbook debt to total assets	LD/A	0.1640	16.00	0.000
Market to book value	M/B	-4.1687	-7.26	0.000
Firm's size	SIZE	18.8613	12.27	0.000
Tangible assets (plant, property and equipment)	PPE	0.6670	7.08	0.000
Profitability	EBITD	-0.0745	-4.99	0.000
Hot or cold market	HOT	-0.0994	-3.69	0.000
Sanction	SANCTION	-2.8376	-11.54	0.000
Exchange	EXCHANGE	-0.0041	-11.13	0.000

Source: Research findings

The results indicate that: One: The first independent variable, the ratio of market-to-book value, which was considered as a measure of market timing, has a negative effect on the leverage. Since, with regard to the definition of the market timing theory, when market value is high, they tend to issue more equity and less debt. Therefore, the hypothesis of the research, which is the impact of market timing on the capital structure of companies in Tehran Stock Market, is confirmed.

Two: The size of the company is determined by various variables such as annual sales, equity value, asset value and stock market value. In this research, size obtained from the logarithm of the total assets of company reveals a positive relationship with book leverage because bigger companies use a larger leverage for a variety of reasons, including more operational transparency and easy access to the debt market.

Three: Profitability variable (EBITD) can have either positive or negative impacts on the capital structure. Because higher profits can increase the ability to engage in debt repayments and cause more leverage. On the other hand, it can be a factor in reducing interest payments and ensuring that shareholders receive more revenues. The results of estimation reveal that the high profitability of listed firms in Stock Exchange Market in Iran has reduced the ratio of debt-to-total assets. In other words, when companies are more profitable, they issue more shares and less debt.

Four: The ratio of fixed assets to total assets (PPE) has a positive impact on the capital structure because more investment in fixed assets will increase the need

for borrowing. Fixed assets can also be used as collateral when borrowing and reducing debt costs. Therefore, the coefficient of this variable is positive in the model.

Five: The exchange rate coefficient also has a negative influence on the capital structure. With the increase of the exchange rate, the economic risk increases at macro level and consequently, managers decide to use less debt.

Six: The dummy variables defined in this research are significant and influence the capital structure. Sanction variable has a negative effect on the capital structure. In fact, managers decide to decrease the leverage to protect firms from the risk of bankruptcy. This finding is consistent with trade-off theory prediction. Hot market, as another dummy variable, has a negative impact on the capital structure. That is, companies operating in hot markets, in comparison with companies active in cold markets (low trading), are more likely to issue shares and keep their leverage ratios low. Therefore, the second hypothesis of the research confirms that the firm's leverage in the hot market is reduced.

Sargan Test has been used to verify the validity of instrument variables and validation of the results. The results are shown in Table 3.

Table 3. Sargan Test Results

J Statistics	51.72134
Prob J Statistics	0.9996

Source: Research findings

Since the probability value of J statistics is greater than 0.05, the H_0 hypothesis is not rejected; there is no correlation between instruments variables and error terms, and the instruments used in all estimates have sufficient validity for proper estimation.

Table 4. Auto-correlation test results

Auto-correlation	Z statics	Prob
AR (1)	3.6313-	0.0003
AR (2)	1.0778-	0.2811

Source: Research findings

Based on table 4, auto-correlation is of the first order, but not of a second order.

6. Conclusion

More than sixty years after the irrelevance theory of Modigliani and Miller, there is still much to be learned about how corporate managers make decisions about financing their projects. Despite the fact that theory has clearly made a significant improvement on the subject, there is no consistency among empirical results.

Among several theories of corporate capital structure introduced over years, only a few seem to have many advocates. Notably, the most important among them are the “trade-off theory”, “pecking order theory” and “market timing theory”. Despite extensive empirical studies in Iran on the first two theories, market timing theory has almost been neglected by researchers.

In addition, based on the previous studies, there are other important variables affecting the corporate leverage, and it is even claimed that more than half percent of the differences in the capital structure is due to external factors. As we know, Iran has been under comprehensive unilateral economic sanctions intensified from 2012 by various groups of countries. Iran has experienced a significant increase in the exchange rate. For this reason, we tried to extend the literature on the effects of intensifying sanctions and increasing exchange rate on the capital structure of Iranian firms. Since sanctions and higher exchange rates lead to higher business risks and more probability of bankruptcy, according to trade-off theory, it is expected to have a negative effect on the leverage ratio.

In this paper, using the data of 55 firms listed on Tehran Stock Exchange Market, a dynamic panel model (GMM) is estimated for the period 2003-2018. It is noted that dynamic panel models are able to determine short and long run values of coefficients. Additionally, because corporate leverage ratio has high persistence or long memory, using GMM makes the lagged dependent variable possible to be used as an explanatory variable.

From the existing literature, we extract key determinants of corporate leverage including profitability, size, tangible properties, stock market conditions (hot or cold markets), and market-to-book value in which the last two are derived from market timing theory. The results indicate that:

- The ratio of market-to-book of the company, which is, according to [Baker and Wurgler \(2002\)](#) a criterion for measuring market timing, has had a negative effect on the capital structure. The existence of an inverse relationship denotes that by increasing market value, managers prefer financing more equity and less debt. When the company's stock is valued more, managers sell more shares and vice versa. This expression is consistent with the definition of market timing.

- According to the market timing theory, a variable called HOT was defined which is equal to "one" for hot years (high trade) and "zero" for one cold year (low trade). The results indicated that market condition (hot or cold) has a significantly negative effect on the capital structure. In other words, managers in the hot markets issue more equity and less debt.

- Firm size and tangible assets have significantly positive effects on leverage ratio. These findings mean that larger firms with more tangible assets face lower default risks, thus, they have relatively more debt. This observation confirms the trade-off theory.

- Profitability variable influences corporate leverage negatively. This finding is consistent with the pecking order theory. Because based on the aforementioned theory, firms prefer internal finance to external funds.

- Sanction and exchange rate variables have negatively significant effects on the capital structure. As mentioned earlier, sanctions and higher exchange rates lead to higher business risks via increasing macroeconomic instabilities; according to the trade-off theory, the corporate leverage is inversely affected by risk because a higher risk leads to the increase in the probability of financial distress.

Since capital structure theories have immensely helped us understand the main factors affecting the mix of debt-equity, financial executors should consider them when making firm's capital structure decisions. As explained, the estimates presented in this paper support the theory of market timing. Since hot-market effects are remarkably robust, it is better that firms go public and issue more equity when the market is hot.

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