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Debt versus Equity in Corporate Financing: Distinction and Resemblance Between Agency Theory and Market Timing Theory in Capital Structure Decisions

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Abstract

This study examines the preference for debt over equity issuance among U.S. companies and analyzes the financial and structural implications of financing decisions by focusing on the interplay between agency theory and market timing theory. The research investigates how these theories explain financing preferences, assesses the impact of key financial ratios on debt levels, and explores the implications for corporate financial strategies. The research employed a quantitative panel data regression analysis, utilized secondary data from 64 U.S. companies over quarterly periods between 2012 and 2017, and sourced from the Securities and Exchange Commission (SEC). Analytical techniques include the Mahalanobis Distance for outlier detection, Pearson's correlation matrix for multicollinearity assessment, and Hausman and Lagrange multiplier tests were used to validate the fixed-effects model.

Findings reveal that companies tend to issue debt to reduce their tax liabilities and increase post-tax cash flow available for dividends. However, a negative relationship is observed between liquidity, measured by the current ratio (CR), and the debt ratio, suggesting that higher liquidity levels lead companies to limited debt, potentially to mitigate agency costs between creditors, management, and owners. Additionally, the negative relationship between company size and debt ratio indicates that larger companies, with higher profitability, tend to maintain lower debt levels. Conversely, asset utilization shows a positive relationship with debt, indicating efficient asset

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use supports higher borrowing capacity. Notably, share price performance and tangibility were statistically insignificant, implying that market timing has limited influence on debt decisions.

The findings highlight the complex dynamics of capital structure decisions, which emphasize the importance of aligning management incentives to maximize shareholders' value while minimizing agency costs. This alignment process would be achieved through performance-based compensation, which is tied to liquidity optimization, profitability, growth opportunities and stock price performance. The study provides a comprehensive evaluation of how equity and debt financing preferences impact corporate financial strategies and behaviors. The study highlights the benefits from tax advantages of debt financing, which enhances post-tax cash flow. The research contributes to the broader understanding of corporate financing strategies in developed markets, though further studies could explore cross-market comparisons.

Keywords: Agency Theory, Market Timing Theory, Current Ratio, Tangibility, Share Price Performance

Introduction

Equity is a company's book value. Besides, equity is the amount of money that is credited to the company's owners and should be returned to the owners in case all assets are liquidated. On the other hand, Equity, as a financing resource, is the debt that is credited to the company's owners as a loan. Accordingly, there are two types of equity financing resources: internal and external equity. Internal equity is considered when a company decides, for example, to finance its assets from either retained earnings or depreciation, while the external equity financing resource is considered when a company decides to issue new equity shares. On the other hand, Debt is the amount of money that is credited to a second party other than the company's owners. Generally, there are two types of debts: short-term debt and long-term debt. Generally, short-term debt is utilized to finance daily operational expenses, while long-term debt is utilized to finance growth opportunities. Through previous definitions of financing resources, equity and debt, companies need to make a financing decision that leads to owners' maximum wealth. A good capital structure decision is needed when a company decides to finance its assets in order to increase its wealth through investment and growth opportunities (Chung et al., 2013), to finance the pay to dividends, to finance its working capital, or to finance the compensation of cash flow due to deficit (Frank and Goyal, 2003) or due to poor business performance (Chung et al., 2013) or due to volatility. The good capital structure decision results from analyzing financial ratios known as capital structure determinants in order to

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produce the optimum proportions of these determinants which produce and maintain the optimum debt ratio (Youssef and El-ghonamie, 2015; Nasimi, 2016) that maximize the owners' wealth.

In line with this context, this research explores some determinants of the capital structure that have been included in several previous journals and confirms the results with two well-known theories: agency theory and market timing theory. In other words, this research aims to provide evidence of how both agency theory and market timing theory explain the companies' financing decisions by interpreting the effect of their capital structure decisions. In addition, aims that its findings may have important implications for companies in terms of simplifying the applications of these theories. The research aims to find if there is any correlation or interaction in the decision-making process between agency theory and market timing theory in terms of financing decisions. Therefore, the main questions of the research are; when a company seeks cash, is the financing decision affected more by agency costs or by market conditions? And if the market conditions tend to be suitable for issuing new debt, does the theory of agency cost help in deciding whether the company goes for internal equity for financing, or might go for external equity and issue new shares?

The result of this research implies that the independent variables can be considered as determinants of the capital structure of U.S. corporations. In addition, the results of this research are consistent with some financial theories. The research showed that companies do not fully follow the agency theory and nor do the market timing theory. The research's main findings were that when a company experiences a high current ratio, they have a lower debt ratio and thus larger companies tend to issue more equity than debt. This means that the financing decisions often depend on the amount of debt accessible, regardless of the management performance and the efficiency of asset utilization. The current ratio (CR) was found statistically significantly negative with the debt ratio, the financial performance or profitability (FP) was found statistically significantly negative with the debt ratio, and asset utilization (AU) was found significantly positive with the debt ratio, and the company's size was found statistically significantly negative with debt ratio. On the other hand, asset structure or tangibility (AS) and share price performance were found statistically insignificantly positive with the debt ratio.

The research has been designed in a way to investigate how the agency theory and market timing theory interpret companies' problems and how they conform to solving principles as suggested by these theories. The research includes five parts: Introduction, Literature Review, Methodology, Data and Results, and Conclusion and Discussion. The literature review includes many journals that have been carefully reviewed and analyzed. Since the statistical

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method and methodology relied on the literature review, it was ensured that the methodology was complemented with all journals that have been reviewed. In the data and results part, all variables introduced in this research have been fully interpreted in order to provide statistically convincing evidence that is consistent with the capital structure theories. The conclusion and discussion part summarizes all variables and their results and interpretations.

Literature Review

Finding the optimal mix of debt and equity is the most interesting topic in corporate finance because an incorrect financial decision may disrupt any company's fortunes and have the tendency to stall the fortunes of any business. Therefore, the management financing decision should be taken in the right direction, debt and/or equity, and at the right time to achieve and identify the optimal financing mix. Therefore, the optimum debt ratio is a critical strategic decision (Modugu, 2013) that is identified by the company's determinants (Harmono, 2017). These determinants' impact on the debt ratio should be identified (Leland, 1994; Karadeniz et al., 2011; Palacim-Sanchez et al., 2013). Equity and debt are located on the liability side of the balance sheet (Myers, 2001) and form a company's capital structure (Acaravci, 2015). Determining the best capital structure is needed to maintain and maximize a company's profitability, survival, growth, and value (Eriotis et al., 2007). The capital structure decision refers to the options that a company uses to finance its assets and thus its investments (Modugu, 2013). These options usually range from full debt to full equity or a mix between them. There is no universal theory of optimal debt-to-equity level (Myers, 2001), but there are several theories, as identified earlier, that can be used to interpret the debt-to-equity ratio that a company chooses.

Agency Theory

Agency theory occurs because the management may pursue their goals and benefits more than the owners' goals and benefits (Kim and Gu, 2005). On the other hand, the agency theory assumes that the conflict of interests and information asymmetry can be reduced by controlling the free cash flow that is required to offset the under-estimated investments and asset issues (Cotei and Farhat, 2009). The agency costs, which are explained by the agency theory, emerged from the conflict between the company's top management and ownership as a result of information inconsistency and asymmetry. According to Kim and Gu (2005), Compensation is related to managerial performance and is better, easier, and sometimes cheaper than monitoring performance. Therefore, the agency theory focuses on the oversight issues resulting from the problem of harmonization of the interests of agents or

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management and shareholders. These types of conflicts of interest can be resolved through both the compensation and monitoring mechanisms structure. These monitoring and controlling costs constitute what is known as agency costs. According to Acaravci, (2015), these costs are spent by owners to ensure managers' efficiency and to reduce the conflict of interests' level in terms of goals and objectives between owners and managers.

The agency costs, which are explained by the agency theory, can be minimized by utilizing compensation for performance. According to Kim and Gu (2005), Compensation is related to managerial performance and is better, easier, and sometimes cheaper than monitoring performance. In addition, they suggested that compensation based on performance is a solution that can be applied to solve the agency problem in order to align the interests of shareholders with management. Therefore, the compensation should be designed to motivate and retain management talent to meet shareholders' expectations while maintaining that the agency costs are not raised significantly. On the other hand, the agency theory assumes that the conflict of interests and information asymmetry can be reduced by controlling the free cash flow that is required to offset the under-estimated investments and asset issues (Cotei and Farhat, 2009). Therefore, the other strategy that is used to reduce the free cash flow and agency costs level is by using debt that consumes the free cash flow and transfers the monitoring of investment risk to the creditors. This strategy helps owners to monitor company performance and reduce the possibility of having an underestimated investment.

Since the agency theory is based on the premise that managers do not perform their duties in the best interest of the owners, this definition can be more elaborated by imposing, firstly, a conflict of interest between owners and management, and secondly between owners and debt creditors (Berger and Patti, 2006; Acaravci, 2015). The conflicts of interest between owners and managers arise as a result of the possibility that managers may seek profits from the company they manage for personal gain at the expense of the owners. The conflicts of interest between the owners and debt creditors arise as a result of the possibility that debt may mitigate the optimal investment incentives. If the return on the investment is higher than the nominal value of the debt, the benefits are to the owners. Conversely, if the investment loss or the return of the investment is lower than the nominal value of the debt, or the company is near to announcing its bankruptcy, the owners have limited responsibility and thus low liability by using their rights to stay away and leaving the debt creditors with a company with a market value below the nominal value of outstanding debt. This means that debt has both positive and negative impacts on owners. The positive impact is that the debt reduces ill-considered investments. The negative impact is that too much debt can lead to high-interest payments, which may lead to a reduction in the acceptance of

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profitable investments and thus the under-investment problem occurs. Therefore, the agency theory demonstrates the agency costs through their impacts on a company's capital structure decisions. Furthermore, agency theory interprets agency costs by investigating several determinants such as growth, free cash flow, and management performance.

Compared with the trade-off theory, one assumption of the trade-off theory there is no agency cost; there is no dispute between management and owners. It assumes that managements always maximize owners' wealth. On the other hand, according to Alzomaia (2014), the trade-off theory argues that in the absence of taxes, the determinants of the capital structure of a company are irrelevant to its value. These assumptions and arguments are known as the irrelevancy theorem. Thus, the optimal capital structure of a company can be achieved through the efforts of all stakeholders, management, and owners in order to maximize the value and minimize total costs that are related to the company, or the agency. In other words, according to the agency theory, it is possible to achieve the optimal capital structure in a world without taxes or bankruptcy. According to Berger and Patti (2006), agency theory presumes that debt affects agency costs and thus affects company performance. They proposed a new method to interpret the agency theory by using profit efficiency, or how close the profit is to the optimum performance of a company that is facing the same external conditions. Furthermore, they employed a synchronous equations model that explains the inverse causality of a company's performance to its capital structure. They found that the United States baking industry is consistent and statistically significant with the agency theory and the proper choice of capital structure helps in mitigating the agency cost effects.

The agency theory assumes that all managerial actions are driven by self-interest, which oversimplifies human behavior. In addition, managers often exhibit intrinsic motivation and ethical considerations that are not accounted for in agency theory. In other words, agency theory focuses on monetary incentives, such as performance-based compensation, neglects non-financial motivators like job satisfaction and organizational culture, which can also align managerial and shareholder interests. Another limitation is the theory's narrow view of debt as a tool to mitigate agency costs. While debt can reduce free cash flow and limit managerial discretion, excessive debt can lead to financial distress and underinvestment, as highlighted by Berger and Patti (2006). Moreover, agency theory assumes a homogeneous group of shareholders with aligned interests, which is rarely the case in practice. Institutional investors, for example, may have different priorities than individual shareholders, leading to complex governance dynamics that agency theory fails to address (Bebchuk and Tallarita, 2020). The theory also overlooks the role of stakeholder capitalism, where companies balance the

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interests of shareholders with those of employees, customers, and society which forms a growing trend in modern corporate governance.

Market Timing Theory

According to the trade-off theory, when a company looks for an external source of finance, it prefers to issue new equity over debt when the stock price is high or inflated even when the company either experiences a very low net present value over investments or does not achieve its capacity of debt (Myers, 1984). In other words, to time the market process is highly considered when a company decides to be financed by external financing resources. On the other hand, when the value of a company improves, the company offsets its equity by increasing debt (Myers, 1984). Furthermore, according to Allini et al. (2018), the order of the proposed financing selection by the pecking order theory changes over time. Huang and Ritter (2009) described the pecking order theory as a special case of the market timing theory, especially when the cost of issuing equity is more than the cost of debt. Unlike the pecking order theory, the market timing theory does not assume a low likelihood of issuing equity as the pecking order theory assumes because the pecking order theory highly considers semi-strong market efficiency as the major influencer on information asymmetry (Huang and Ritter, 2009). This means that the pecking order theory presumes a low probability impact of information asymmetry and thus it cannot clearly explain the chosen financing resource, either equity or debt when the stock price is high. The market timing theory does not propose an optimal level of capital structure (Baker and Wurgler, 2002) but it suggests that there is an opportunity that could be exploited as the cost of equity changes over time (Huang and Ritter, 2009). Therefore, companies should take advantage of the stock market change compared to the cost of either financing resources, equity, or debt (Baker and Wurgler, 2002). In other words, to time the market process is highly considered when a company decides to be financed by external financing resources.

The market timing theory explains and develops a relationship between equity market timing and companies' capital structure (Baker and Wurgler, 2002). The market timing theory better explains the changes in the cost of equity over a time cycle (Huang and Ritter, 2009). The market timing theory predicts that when companies issue new equity in an opportune market situation (Cotei and Farhat, 2009) and when the price-to-book value is high. When time passes during successive economic cycles is the main influence on determining the financing source (Feidakis and Rovollis, 2007). Zavertiaeva and Nechaeva (2017) argued that companies switch to a debt market timing approach during the crisis and recovery cycle due to the low availability of sufficient investors' liquidity. Therefore, the market timing theory better

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explains the changes in the cost of equity over a time cycle (Huang and Ritter, 2009). This means that, when companies decide to go for external financing resources, companies should take advantage of the stock market change compared to the cost of either financing resources, equity, or debt (Baker and Wurgler, 2002). In other words, the attempt to time the market is an added determinant of capital structure (Chung et al., 2013) in order to add the market impacts and their inconsistency on this capital structure (Zavertiaeva and Nechaeva, 2017). The market timing theory predicts that when companies issue new equity in an opportune market situation (Cotei and Farhat, 2009) when the price-to-book value is high. On the other hand, companies increase debt when investment opportunities are plentiful and demand for venture capital is high or when they experience poor business performance that reduces their stock price or forces them to borrow (Chung et al., 2013). Therefore, the debt ratio will be reduced, as well as the financing deficit will be recovered, while the financing surplus will be increased (Cotei and Farhat, 2009). In other words, when the stock price is high, companies issue more equity, while when the stock price is low, they tend to purchase back their equity.

From the market timing perspective, the capital structure is a cumulative result of earlier market situations (Chung et al., 2013). According to Baker and Wurgler (2002), capital structure is the cumulative result of a manager's endeavor to time the capital market. Based on companies' behavior, Baker and Wurgler (2002) noted that there are two types of equity market timing. The first type is dynamic, which is affected by stories about companies' intention to issue new equity. The second type a company issues new equity when they experience a low cost of equity, while they repurchase equity when the cost of equity is high. According to Sinha and Ghosh (2009), the dynamic type of market timing affects the cost of information asymmetry in a short-term period. This effect may lead to a dynamic reverse of the order of financing source selection and thus companies may follow the pecking order selection process. On the other hand, in a long-term period, Sinha and Ghosh (2009) found that there is no dynamic reverse in the order of financing source of selection.

In terms of the theory approach, there are two types of market timing theory. In the first type, the theory presumes that companies' management is rational and thus companies issue new equity after the publication of positive information to reduce information asymmetrical problems. The publication of positive information leads to an increase in the share price and thus timing (Baker & Wurgler, 2002). Contrary, the second type presumes that the investors' irrational behavior may reduce the share price and thus companies repurchase their equity. In terms of the market timing approach, there are two types of market timing theory. The first type is when the companies issue new

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equity at a high share price and repurchase it at a low share price, while the second type is when companies increase their debt at low interest costs (Zavertiaeva and Nechaeva, 2017). That is what Serghiescu and Văidean (2014) explained, the market timing theory determines some situations of the stock market and macroeconomics within a country that may affect the capital structure of companies listed on an exchange market list. Finally, the market timing theory does not propose an optimal level of capital structure (Baker and Wurgler, 2002), but it suggests that there is an opportunity that could be exploited as the cost of equity changes over time (Huang and Ritter, 2009).

The market timing theory assumes that managers can accurately time the market. Loughran and Ritter (2004) demonstrate that market timing is fraught with challenges, as stock prices are influenced by unpredictable economic factors and investor sentiment. Therefore, many companies that attempt to time the market end up issuing equity at inflated prices, only to face subsequent declines, leading to value destruction for shareholders. In addition, market timing theory lacks a coherent framework for explaining how firms balance the trade-offs between equity and debt financing over time. Unlike trade-off theory, which provides clear guidelines for optimizing capital structure based on tax benefits and bankruptcy costs, market timing theory offers no such guidance (Frank and Goyal, 2009). This makes it difficult for firms to apply the theory in practice, particularly in volatile market conditions.

Furthermore, market timing theory does not account for the long-term consequences of financing decisions. While issuing equity during high market valuations may provide short-term benefits, it can dilute ownership and reduce earnings per share, negatively impacting long-term shareholder value (Graham and Harvey, 2001). Similarly, increasing debt during low-interest periods may lead to unsustainable leverage levels, increasing the risk of financial distress during economic downturns. The theory also overlooks the role of information asymmetry in capital markets. Huang and Ritter (2009) argued that companies with high information asymmetry may struggle to time the market effectively, as investors may discount their equity offerings due to uncertainty. This contradicts the theory's implicit assumption that all firms have equal access to market timing opportunities.

Variables

This study's empirical strategy is informed by both agency theory and market timing theory. Agency theory suggests that conflicts of interest between managers and shareholders can influence capital structure decisions. To examine this, the study includes variables like the current ratio, financial performance, asset utilization, company size, and asset structure, which are relevant to understanding how agency costs affect the demand for debt. For instance, the current ratio helps assess a company's liquidity, which can impact

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the agency costs associated with debt (Myers and Rajan, 1998). Financial performance and asset structure are also analyzed in the context of how they might mitigate or exacerbate agency problems. Market timing theory, on the other hand, posits that managers adjust their capital structure in response to market conditions, such as share price fluctuations. The study incorporates share price performance as a key variable to assess this theory in addition to the company's size. By including these variables, the research can assess whether companies strategically time the issuance of debt and equity to take advantage of market conditions.

While agency theory and market timing theory provide valuable insights into capital structure decisions, both have significant limitations. Agency theory's narrow focus on self-interest and simplistic view of debt overlooks the complexities of modern corporate governance. Market timing theory, on the other hand, overestimates the ability of firms to time the market and fails to address long-term consequences and information asymmetry. As a result, the research involves Total Debt-to-Asset (TDA) as the dependent variable, while it involves six independent variables; Current Ratio (CR), Financial Performance or Profitability (FP), Asset Utilization (AU), Asset Structure or Tangibility (AS), Share Price Performance (SPP), and Size (SR). The variables and the proposed null hypothesis have been summarized in Table 1.

Table 1. The Proposal Null hypothesis in the research

		Agency Theory	Market Timing Theory
1	TDA ~ CR	Negative	
2	TDA ~ FP	Positive	
3	TDA ~ AU	Negative	
4	TDA ~ AS	Positive	
5	TDA ~ SPP		Negative
6	TDA ~ SR	Positive	Negative

Debt Ratio (Debt-to-Assets) [TDA]

The capital structure risk is represented by the debt ratio. Therefore, the greater the debt ratio, the greater the risk is related to debt utilization. As a result, companies may use the debt ratio as an attribute of the financing method either internally or externally. In this research, the equation that was used by Alipour (2015) to calculate the debt ratio will be used in this research,

Debt Ratio = Total Debt / Total Assets

Current Ratio [CR]

The current ratio rates the willingness of a company to cover its current commitments and thus shows adequate financial stability over the short term. Therefore, since the current ratio applies to the current assets and the current liabilities, the current ratio is generally linked to short-term debt. In this

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research, the equation that was used by Sheikh and Wang (2011) to calculate the current ratio will be used in this research,

Current ratio (CR) = Current Assets / Current Liabilities

The null hypothesis is,

H01: there is a negative association between the current ratio and the debt ratio.

Financial Performance (Profitability) [FP]

Profitability proves a company's effectiveness in using its overall assets to achieve revenue. According to the agency theory, there is a positive association between profitability and debt because the theory suggests that more debt would motivate a company to spend out the free cash rather than use it in wasteful investments (Bauer, 2004; Acaravci, 2015) and therefore reduce the agency costs (Modugu, 2013). On the other hand, Tong and Green (2004) noted that higher leverage for low-profit companies would raise the risk of bankruptcy and debt expenses and thus reduce the dividend payout. In this research, Earning Before Interest, Tax, Depreciation, and Amortization (EBITDA) will be used. EBITDA is the best variable option to measure profitability, according to (Feidakis and Rovollis, 2007), because it is not influenced by interest, taxation, depreciation, and amortization which may differ between companies. In this research, the equation that was used by Sheikh and Wang (2011) to calculate the financial performance ratio will be used in this research,

Financial Performance (Profitability) (FP) = EBITDA / Total Assets

The null hypothesis is,

H02: There is a positive association between financial performance (profitability) and debt ratio.

Asset Utilization [AU]

The utilization of debt generates an agency cost (Sheikh and Wang, 2011). Therefore, the competitive value of an agency's cost is signified by the utilization of debt and its measured ratio. According to the agency theory, the greater asset utilization, the greater the management efficiency in the adoption and utilization of assets, and thus cost reduction (Jermias, 2008), cash increment, and the need to borrow are reduced (Alipour et al., 2015). Therefore, this ratio is expected to have a negative relationship with the debt

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ratio. In this research, the equation that was used by Jermias (2008), and Alipour (2015) to calculate the asset utilization ratio will be used in this research.

Asset Utilization (AU) = Sales / Total Assets

The null hypothesis is,

H03: there is a negative association between asset utilization and debt ratio.

Asset Structure (Tangibility) [AS]

Tangible assets are important because they are collateral that protects a debt (Bhaird and Lucey, 2010) and thus the bankruptcy risk will be reduced (Feidakis and Rovollis, 2007; Cotei and Farhat, 2009; Modugu, 2013; Acaravci, 2015). In the case of bankruptcy, a company with more tangible assets should provide more collateral assets to repay loans and thus would have a better possibility of obtaining more debt (Alipour et al., 2015). The agency theory predicts that the owners in a leveraged business have an opportunity to invest sub-optimally (Titman and Wessels, 1988). In this research, the equation that was used by Sheikh and Wang (2011), and Titman and Wessels (1988) to calculate the asset utilization ratio will be used in this research,

Asset Structure (Tangibility) = Fixed assets / Total Assets

The null hypothesis is,

H04: There is a positive association between asset structure (tangibility) and debt ratio.

Share Price Performance [SPP]

According to the market timing theory, there is a negative relationship between a company's share price and debt (Deesomsak et al., 2004) because when the share price rises, the company issues equity (Antoniou et al., 2008). In this research, ethe quation that was used by Deesomsak et al. (2004), Antoniou et al. (2008), and Alipour (2015) to calculate the share price performance ratio will be used in this research.

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Share Price Performance (SPP) = [Share Price (current period) – Share Price (previous period)] / Share Price (previous period)

The null hypothesis is,

H05: There is a negative association between Share Price Performance and debt ratio.

Company's Size [SR]

Unlike trade-off theory, a company's size and debt are negatively related. The presence of this negative relationship may be attributed to the reason that larger companies have the capability to issue new shares rather than issue debt. This means that larger companies utilize less debt in their capital structure (Deloof and Overfelt, 2008). On the other hand, Crutchley and Hansen (1989) proposed five determinants for agency costs: earnings volatility, research and development and advertising expenses, flotation costs, costs due to the diversification of common shares to the management, and size. They found that volatility is significantly negative with leverage, the expense is negative with debt, and positive relationship between size and leverage. Therefore, the research chose the companies' size proxy in order to help distinguish companies' behavior in terms of following either agency theory or market timing theory. In this research, the equation that was used by Sheikh and Wang (2011) to calculate the companies' size will be used in this research,

Size (SR) = ln (Total Assets)

And the null hypothesis is,

H06: There is a negative association between company size and debt ratio.

Methodology

It is important to determine the required statistical analysis in order to determine the sample size and statistical method after completing the research questions and objectives (Golafshani, 2003; Saunders et al., 2012; Collis and Hussey, 2013). Statistical instruments can be utilized to make the statistics significant (Collis and Hussey, 2013). The data that were collected are quantitative in nature and sufficient statistical measures have been implemented to obtain the research goals. The research aims to understand the features and behavior of the companies under observation by consistently observing these companies over a period. Cross-sectional analysis is an

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analytical type of approach used to analyze a group of observations at a given point in time. On the other hand, there are some effect detections and measurements that cannot be detected in cross-section or time series statistics. Therefore, to examine the relationship between key financial indicators and a company's debt ratios, the research utilized panel data regression statistics as the primary analytical framework due to its capacity to capture both cross-sectional variations across firms and temporal dynamics within firms, thereby providing more nuanced and reliable estimates than conventional cross-sectional or time-series approaches. According to Saunders et al. (2012), the panel data regression aims to reduce the nested linear overlapping relationships between selected variables, offering better estimates of coefficients.

The advantages of the panel data regression are that, can be used to simulate both collective datasets and individual activities of the community, includes more details, more complexity, and more effectiveness than time series or cross-sectional analysis, and can be used to observe and quantify statistical impacts that are difficult with time series or cross-sectional analysis, can be used to mitigate calculation biases that may result from group aggregation in a single time series. Thus, using the data panel regression has the advantage of discriminating whether individuals are independent of time (Fixed or constant effect across individuals) or not (Random or vary across individuals). Additionally, the methodological approach offers several strengths, including the ability to control unobserved firm-specific factors and temporal trends.

On the other hand, the disadvantage of panel data regression is that it must be modeled accurately by considering the fixed effect versus the random effect. In addition, there is a potential for omitted variable bias, as the model does not account for certain macroeconomic factors or qualitative aspects of corporate governance that may influence capital structure decisions. However, the fixed-effects estimator mitigates some of these concerns by absorbing time-invariant heterogeneity. Since the financial data are subject to reporting conventions and potential inconsistencies inherent in SEC filings, there is a possibility for measurement error. However, the use of standardized reporting formats such as XBRL reduces this risk.

The regression model is formally specified to assess the determinants of corporate leverage, with the total debt ratio (TDA) serving as the dependent variable. Independent variables include the current ratio (CR), financial performance (FP), asset utilization (AU), asset structure (AS), share price performance (SPP), and firm size (SR). The model incorporates fixed effects to account for unobserved heterogeneity across companies and time periods.

Finally, a series of diagnostic tests were conducted to validate the model's assumptions and robustness. In order to detect the outliers in the

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datasets, the Mahalanobis Distance has been applied. Then the cumulative distribution Chi-Square has been applied to determine and drop the observations that have a probability of less than or equal to 0.001. In order to detect multicollinearity within dependent variables, Pearson's correlation matrix has been applied. Since the dataset includes observations for companies (individuals) over a quarterly financial period (time), panel data regression was applied. A Lagrange multiplier test has been used in order to determine the appropriate type of panel regression for the collected datasets. Then, the Hausman test was applied in order to determine whether the fixed effect or the random effect is more appropriate. The research used Durbin-Watson statistics to evaluate the first-order serial correlation. In addition, the F-statistics were applied to reflect the validity of the chosen regression.

Data Collection

It is important to determine the required statistical analysis in order to determine the sample size and statistical method after completing the research questions and objectives (Golafshani, 2003; Saunders et al., 2012; Collis and Hussey, 2013). The research aims to understand the features and behavior of the companies under observation by consistently observing these companies over a period. However, there are some effect detections and measurements that cannot be detected in cross-section or time series statistics. Therefore, the research utilized panel data regression statistics. One of the two major categories of data is secondary data, while the other category is primary data. In analysis and statistics, these two types of data are helpful, but for the purpose of this research, the dataset collection has been limited to a secondary dataset because it was downloaded from the website of the United States Security and Exchange Commission (SEC). The datasets that have been downloaded cover the quarterly periods of sixty-four companies between 2012 and 2017 in order to assess and evaluate the selected variables. According to Hox and Boeije (2005), the secondary data must be closely reviewed as to whether they match the relevant research questions. Therefore, an evaluation of the data collection has been conducted in order to obtain answers to the research aims. Since 2009, SEC ordered the registered companies to submit their financial figures using SEC-XBRL model (Hoitash and Hoitash, 2017) as well as sending their financial statements; 10-K and 10-Q in a format that fits the Electronic Data Gathering, Analysis, and Retrieval system (EDGAR) (Dhole et al., 2015) and to be classified in compliance with standardized taxonomies (Dong et al., 2016).

Statistical Model

All proxies that are used in the research have been described, calculated, and derived from the companies' financial statements. The

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following regression represents an originally suggested regression that is utilized to study relationships between proposed dependent variables and debt ratio,

$$TDA_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 FP_{it} + \beta_3 AU_{it} + \beta_4 AS_{it} + \beta_5 SPP_{it} + \beta_6 SR_{it} + \varepsilon_{it}$$

Where:
$\beta_0, \beta_1, \beta_2, and\ \beta_3$: are unknown Coefficients.
i: the individual (company)
t: duration (quarterly fiscal period)
ε_{it} : the random error for individual (company) i at duration t

And,

Table 2. Variables

	Initial	Variable	Calculation	Used by
1	TDA	Total Debt Ratio	Total Debt / Total Assets	Alipour (2015)
2	CR	Current Ratio	Current Assets / Current Liabilities	Sheikh and Wang (2011)
3	FP	Financial Performance (Profitability)	EBITDA / Total Assets	Sheikh and Wang (2011)
4	AU	Asset Utilization	Sales / Total Assets	Jermias (2008) and Alipour (2015)
5	AS	Asset Structure (Tangibility)	Fixed Assets / Total Assets	Sheikh and Wang (2011), Titman and Wessels (1988)
6	SPP	Share Price Performance	[Share Price (current period) – Share Price (previous period)] / Share Price (previous period)	Deesomsak et al. (2004), Antoniou et al. (2008), and Alipour (2015)
7	SR	Size Ratio	Ln (Total Assets)	Sheikh and Wang (2011)

Descriptive Statistics

The following table describes the statistical measures of both independent and dependent variables. The table shows that companies, on average, rely less on debt but more on their assets in financing their operations. On the other hand, since the median is less than the mean, companies tend to reduce their debt-to-asset ratio. The negative mean sign and the positive median sign of the share price performance show that most companies issue new shares, while there are a few big companies that repurchase a high amount of their shares and this behavior is in line with the mean and median of

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companies' size. The high mean value of the current ratio shows that companies have either high credit sales, high inventory levels or high cash and cash equivalent amounts. The mean value of financial performance is negative, while median is positive. This means that companies experience a loss with constant pursuit of profit.

Table 3. Descriptive Statistics

		CR	FP	AU	AS	SPP	SR	TDA
1	Min.	0.05519	-6.727287	0.01406	0.004746	-5.995114	10.53	0
2	1st Qu.	1.53315	0.009406	0.34505	0.124857	0	19.49	0.4786
3	Median	2.06854	0.033559	0.62706	0.299155	0.000366	20.54	0.561
4	Mean	4.00006	-0.046786	0.82148	0.313243	-0.005022	20.16	0.718
5	3rd Qu.	6.22737	0.069419	1.0617	0.48201	0.002977	21.7	0.6843
6	Max.	20.87213	0.561899	5.27249	0.957999	0.999992	23.54	11.7417

Outliers and Multicollinearity

In order to detect the outliers in the datasets, the Mahalanobis Distance has been applied. Then the cumulative distribution Chi-Square has been applied to find and drop the observations that have a probability less than or equal to 0.001. In order to detect multicollinearity within dependent variables, Pearson's correlation matrix has been applied as shown in Table 4. The inter-correlation is less than 0.7 for all variables, which keeps the proposal regression to estimate TDA valid, and the robustness test will not be needed.

Table 4. Pearson Correlation Matrix

		CR	FP	AU	AS	SPP	SR
1	CR	1	0.136833	-0.3793	-0.60128	-0.02322	0.299217
2	FP	0.136833	1	-0.34973	0.094442	-0.01871	0.519895
3	AU	-0.3793	-0.34973	1	0.138172	0.055363	-0.40161
4	AS	-0.60128	0.094442	0.138172	1	0.027717	0.052418
5	SPP	-0.02322	-0.01871	0.055363	0.027717	1	-0.03377
6	SR	0.299217	0.519895	-0.40161	0.052418	-0.03377	1

Regression Model

Table 05 shows that the Lagrange multiplier test was statistically significant (p-value < 0.001) and thus the panel data model (fixed or random) is preferred over the pooled model. The Hausman test showed that the p-value is less than 0.001, which shows that the null hypothesis is rejected, and the fixed effect is proper. On the other hand, the Durbin-Watson statistics showed that errors are not correlated, and the F-statistics showed statistically significan resultst, reflecting the validity of the chosen regression.

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Table 5. Regression model results

Variables	TDA
CR	-0.077***
	(-6.624)
FP	-0.132***
	(-3.601)
AU	0.366***
	(9.888)
AS	0.153
	(0.810)
SPP	0.009
	(0.237)
SR	-0.367***
	(-7.955)
Fixed time effects	Yes
Fixed cross-section effects	Yes
No. of Observations	1114
R-Squared	0.22561
Adjusted-R^2	0.15251
F-statistics	49.3819***
Durbin-Watson	2.3187
Lagrange Multiplier	20.753***
Hausman test	< 0.001

Notes: The dependent variable includes *Debt-to-Assets (TDA)* equals the Total Debt of companies divided by the Total Assets at the end of the fiscal quarter.
The independent variables, including *Current Ratio (CR),* are equal to Current Assets divided by Current Liabilities at the end of the fiscal quarter. *Financial Performance or Profitability (FP)* is equal to EDITDA divided by Total Assets at the end of the fiscal quarter. *Assets Utilization (AU)* equals Net Sales divided by Total Assets at the end of the fiscal quarter. *Asset Structure or Tangibility (AS)* equals Fixed Assets divided by Total Assets at the end of the fiscal quarter. *Share Price Performance (SPP)* equals [(Share Price (current fiscal quarter) – Share Price (previous fiscal quarter)] / Share Price (Previous fiscal quarter). *Size (SR)* equals ln (Total Assets) at the end of the fiscal quarter.
T-statistics are in parentheses beneath coefficient estimates.
*** Significant at 0.01
** Significant at 0.05
* Significant at 0.1

From table-5, the results confirm a statistically significant negative relationship between the current ratio (CR) and debt ratio and thus the null hypothesis H01 cannot be rejected at significance level 0.001. This suggests that companies with higher liquidity prefer lower debt levels, possibly to avoid financial distress or to maintain flexibility. A higher current ratio indicates stronger short-term solvency, reducing the need for external borrowing. This aligns with the pecking order theory, where companies prioritize internal financing over debt. On the other hand, from an agency theory perspective,

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managers of companies with higher liquidity may avoid debt to minimize monitoring from creditors, which supports the negative relationship.

Contrary to expectations, financial performance (FP) exhibits a significant negative relationship with debt ratio and thus H02 is rejected. This contradicts the trade-off theory, which posits that profitable companies use more debt to benefit from tax shields. Instead, the findings align with the pecking order theory, where companies with higher profitability rely on retained earnings rather than external debt. Agency theory further explains that managers may avoid debt to reduce bankruptcy risk and maintain discretionary control over free cash flows rather than committing to fixed repayments.

The regression reveals a significant positive relationship between asset utilization (AU) and debt ratio and thus the null hypothesis H03 is rejected. This implies that companies with higher asset efficiency tend to carry more debt, possibly because lenders view efficient asset use as a sign of lower risk and higher collateral value, which increases debt capacity. Alternatively, companies with high asset utilization may take on more debt to finance growth. This finding does not directly align with agency theory, which predicts that high-efficiency companies might avoid debt to prevent creditor interference. However, it could fit the market timing theory if companies capitalize on favorable borrowing conditions when asset performance is strong.

The asset structure (AS), or tangibility, shows a positive but statistically insignificant relationship with debt ratio. The positive relationship is as proposed in the null hypothesis but not significant with debt ratio and thus the null hypothesis H04 is rejected. While trade-off theory suggests that tangible assets facilitate debt financing by providing collateral, the lack of significance implies that other factors (e.g., growth opportunities, industry risks) dominate. In other words, while tangibility is often expected to increase debt capacity due to collateral value, the lack of significance suggests that other factors, such as industry-specific characteristics or macroeconomic conditions, may play a more dominant role. For example, companies with high intangible assets (e.g., tech companies) may rely more on equity financing despite lower tangibility, diluting the expected positive relationship. On the other hand, Agency theory predicts that companies with higher tangible assets have a higher debt ratio due to lower asset substitution risks, but the weak relationship suggests that creditors may not rely solely on collateral. The positive relationship does not strongly align with market timing theory, as tangibility is a structural factor rather than a market-driven one.

The results show no significant relationship between share price performance (SPP) and debt ratio, and thus the null hypothesis H05 is rejected, which contradicts market timing theory. In addition, the lack of significance implies that companies do not adjust leverage based on short-term stock

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performance, possibly because capital structure decisions are driven by long-term financial strategies rather than market fluctuations or possibly because managers prioritize fundamental financial metrics over short-term stock movements when determining leverage.

The results support H06, showing a significant negative association between company size (SR) and the debt ratio and thus the null hypothesis H06 cannot be rejected. Larger companies, often with diversified revenue streams and lower bankruptcy risk, may rely more on retained earnings or equity financing. Conversely, smaller companies might use higher debt to overcome size disadvantages. Though the negative relationship here suggests larger companies exploit non-debt advantages, such as better access to equity markets. Agency theory suggests that large companies face lower asymmetric information costs, which allows easier equity issuance, while market timing theory could explain this if larger companies time equity issuances during favorable market conditions, which reduces reliance on debt.

Conclusion

The datasets were downloaded from the United States Security and Exchange Commission (SEC) and comprised sixty-four companies between 2012 and 2017. Due to the dataset nature which contains individual effects that vary over time, a panel data regression was used. The research aims to define the potential determinants in terms of their compatibility with the agency theory and market timing theory. Therefore, the research analyzed many determinants in order to investigate their impacts on the debt ratio and to assess the consistency of these determinants with the agency theory and market timing theory. The research explores numerous credential literature to articulate the critical issues in capital structure from the perspective of these two theories. Moreover, the research explores the capital choice decision process of a company. Therefore, the companies' performance was investigated as a reflection of total agency costs through investigating the relationship between the performance and debt ratio. Furthermore, this research has been designed to provide an extensive explanation of the agency and market timing theories.

The findings showed that the companies in the datasets prefer debt to equity issuance. The negative relationship between liquidity, current ratio (CR), and debt ratio is consistent with attempts by the companies to explain the agency costs as a result of a possible dispute between creditors and owners, and between companies' management and owners (Modugu, 2013). According to Acaravci (2015), debts lower the tax liability of the companies and raise the post-tax cash flow to dividends. The negative relationship between companies' size and debt ratio may indicate that larger companies tend to have more investments that produce more profits, which enable them

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to sustain a possible low level of debt. The statistically significant negative relationship between the current ratio (CR) and debt (TDA) is consistent with the principle of agency theory. The negative association suggests that debts do not need to be used by companies with enough liquidity and thus have a lower debt ratio. Moreover, according to the agency theory, the negative association can be interpreted as justifying the increasing agency costs due to the possible dispute between lenders and the owners and between the management and the owners (Modugu, 2013). Myers and Rajan (1998) argued that the reason for this negative relationship is that as the liquidity of an agency's costs are raised, the outside lenders restrict and reduce the amount of debt accessible to the company. In addition, the results are consistent with Eriotis et al. (2007), and Sheikh and Wang (2011).

The negative relationship between financial performance, profitability (FP) and debt (TDA) is not consistent with the agency theory. This indicates that while agency theory explains some aspects of capital structure decisions, market timing theory and the pecking order theory offer additional insights. This result has also been confirmed by the negative relationship between companies' size (SR) and debt (TDA) and by the positive relationship between asset utilization (AU) and debt (TDA). On the other hand, the results are consistent with the pecking order theory (Bauer, 2004; Sheikh and Wang, 2011; Mateev et al., 2013; Modugu, 2013; and Acaravci, 2015). Furthermore, Bauer (2004) reported a positive relationship between profitability and short-term debts, while long-term debt profitability has a negative relationship. This means that companies depend more on long-term debt than short-term debt.

The asset structure (tangibility) (AS) shows an insignificant statistically positive relationship with debt (TDA). The positive relationship is consistent with the agency theory and with the results of Titman and Wessels (1988). According to the trade-off theory, there is a positive relationship between debt and tangibility because the more tangibility, or fixed assets, the more ability to have more debt, because the more fixed assets shift the bankruptcy point upward. Tangible assets may have a negative relationship with debt through growing risk by increased operational leverage (Hutchinson and Hunter, 1995). On the other hand, according to the pecking order theory, companies with high tangible assets have a minor issue in terms of asymmetry information, while companies with low tangible ratios would prefer to issue new equity.

The positive relationship between asset utilization (AU) and debt (TDA) can be interpreted as the ownership continues to have a significant part in the decision-making on the capital structure of the companies (Alipour et al., 2015). The insignificant statistically positive relationship of share price performance (SPP) with debt (TDA) indicates that companies tend to prefer debt to equity regardless of the market situation. The significant statistical

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negative relationship between a company's size (SR) and debt (TDA) indicates that larger companies appear to have a reduced debt level due to their willingness to issue new equity (Sheikh and Wang, 2011; and Degryse et al., 2012) than debt. Eriotis et al. (2007) concluded that larger companies had more varied investments and thus less chance of bankruptcy. Thus, their size helps them to sustain a relatively high debt level (Daskalakis and Paillaki, 2008; Bhaird and Lucey, 2010). The presence of the negative relationship may be attributed to the reason that larger companies have the capability to issue new shares rather than issue debt. On the other hand, the positive relationship is contrary to Crutchley and Hansen's (1989) results, which indicated that companies' behavior was not consistent with the agency theory.

The findings of this research contribute to the ongoing discourse in corporate finance by providing empirical evidence that supports and challenges agency theory and market timing theories. Specifically, the study reinforces the relevance of agency theory in explaining the relationship between liquidity and debt levels. A critical examination of the theoretical assumptions against empirical results reveals some limitations in both theories. Agency theory assumes that managers always act in their self-interest, but the findings suggest that other factors, such as market conditions, also play a significant role in capital structure decisions. While agency theory predicts that higher profitability should lead to more debt, the results indicate the opposite, aligning with the pecking order theory. This suggests that the assumption that management always prioritizes their interests might be too simplistic. However, it also highlights the limitations of agency theory in fully explaining the complex interplay between profitability, company size, asset utilization, and capital structure. The results suggest that the pecking order theory may offer a more comprehensive framework for understanding these relationships in the context of the companies studied. Additionally, while market timing theory is useful in explaining short-term capital structure adjustments, the research does not lend dedicated support to market timing theory, as share price performance did not exhibit a significant relationship with debt ratios. This suggests that, for the companies in this sample, market conditions may not be a primary driver of capital structure decisions, which suggests that behavioral and institutional factors also play a crucial role in shaping financing decisions.

Since the goal of the stockholders is to maximize their wealth and benefits that may result from stock price increments, the alignment between the interests of ownership and management is related to financial preferences and action alignments (Nyberg et al., 2010). Therefore, the management compensation should be well planned in order to motivate the management to safeguard the interests of the owners. (Kim and Gu, 2005). One of the agency's costs is the extra costs of debt that is needed to confine management behavior.

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According to the agency theory, managements tend to reduce these costs by announcing them in the financial statement (Abdullah and Ismail, 2008). Management is better rewarded based on certain performance indices such as profitability and increase in stock prices. (Kim and Gu, 2005). The findings suggest that financing decisions are influenced by a combination of internal factors (such as liquidity and profitability) and external constraints (such as debt accessibility), rather than purely theoretical predictions. For financing practices, the findings highlight the importance of context-specific capital structure strategies. Decision makers and financial managers should consider company-specific determinants, such as liquidity and asset utilization, when designing financing policies, rather than relying solely on theoretical frameworks. In terms of policy, the findings suggest that regulators should continue to promote transparency and accountability in corporate financial reporting to minimize information asymmetrical and agency problems.

Since the research introduced an empirical study on selected companies listed in the U.S. Exchange, it may limit the generalizability of the findings to private companies or companies operating in other markets, particularly those with different regulatory environments and financial structures. Therefore, more empirical research may extend the findings by analyzing them across developed markets as well as various stock markets. Further research could also explore the role of other potential determinants of capital structure, such as corporate governance mechanisms, institutional ownership, and the quality of financial reporting.

Finally, both agency theory and market timing theory provide valuable frameworks for understanding capital structure decisions, but neither theory alone can fully explain the complexities observed in real-world corporate financing behavior. Finally, this study advances the understanding of capital structure determinants while challenging the rigid application of agency and market timing theories. By integrating empirical findings with theoretical frameworks, it paves the way for more nuanced and context-aware financial decision-making. Future research should build on these insights to develop holistic models that account for the complexities of modern corporate finance.

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