

Application of Market Timing Theory: Evidence from Canadian Firms

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Internal and external finance are the two primary forms of funding for businesses. Internal financing is derived from retained profits, while external financing may come through borrowing money or the issuance of stocks. Businesses utilize it constantly to grow and stay alive, so the choices they make about finance are crucial. Market timing is vital for determining the appropriate financial structure for a company's success because volatility in market valuation greatly affects the capital structure. Capital structure requires a decision-making tactic that is an art to tackle complex situations. Modigliani and Miller started this ground-breaking study on capital structure in the field of corporate finance in 1958. After that, several theories were developed, but one of those theories was the market timing theory of capital structure, which explains that firms issue new stock when their share price is overvalued and repurchase shares when their share price is undervalued. These price fluctuations of equity will affect corporate financing decisions and ultimately corporate capital structures. The goal of this study is to test the applicability of market timing theory in the context of Canadian firms; thus, the data have been collected from the FINVIZ Stock Screener for the period (2022) and analyzed by a generalized linear model technique through the E Views 13. The research concludes that the market-to-book ratio has a statistically significant negative effect on market leverage as well as book leverage.

Keywords: Canadian Firms, Capital Structure, High Valuation, Market Timing Theory, Market to Book Ratio.

1. Introduction

The equity market timing theory of capital structure posits that managers possess the ability to identify periods during which equity issuance is relatively less expensive compared to other forms of external funding due to the market's overvaluation of the company's shares. Successful market timing reduces the cost of stock for existing shareholders while increasing the cost for prospective investors. If managers can time the equity market, proxies for misvaluation should be correlated with the timing of the security issuance decision (Brendea, 2012; Elliott et al., 2008). The capital structure of a company is the ratio of debt to equity used to finance its operations. Financial markets are flawed, and investor emotions may momentarily disvalue equities. Market timing is not only restricted to stock issuance but can be applicable to the other key financing channel, namely, issuing debt.

On the one hand, some theories are a just theory, which means they do not apply anywhere or under any condition. Still, on the other hand, many theories cannot be tested empirically due to different reasons such as miss conception, lack of data, psychological behavior of clients in financial environments, and applicable methods. Fortunately, market timing theory is one of the most essential and functional theories in capital structure to maximize the value and minimize the firms' cost, as this study successfully tested in listed firms in stock markets in Canada.

In summary, the market timing theory states that firms could exploit imperfections in financial markets to get access to low-cost debt or equity capital. Capital structure is essential for the maximization of value for firms, especially Canadian corporations, and this decision needs art and science. This article will help the reader understand one of the main theories of capital structure, market timing theory, either theoretical or practical.

2. Literature Review

Nothing is more difficult, and therefore more precious, than to be able to decide. When making the decision to maximize the value of a corporation, the managers of the firm must know about the theories of capital structure. Capital structure is the proportion of debt to equity, and selecting the optimal composition of debt and equity causes a high valuation due to the low cost of debt and capital for companies (Karasioğlu et al., 2021).

According to Baker and Wurgler's (2002) market timing theory of capital structure, a firm's capital structure is the sum of its attempts to time the equity market. They found that the long-term average leverage ratio is highly connected to the market-to-book ratio, and they concluded that low-leverage firms raised capital when equity valuations (market-to-book ratios) were high. In contrast, high-leverage firms raised money when equity valuations were low (Elliott et al., 2007). Below, capital structure theories are explained shortly:

MM Theorem

Modigliani and Miller started this ground-breaking study on capital structure in the field of corporate finance in 1958. The MM Theorem states that in ideal capital markets, leverage has no effect on company value. This theory demonstrates that the debt-to-equity ratio has no impact on a firm's value (Ahmeti & Prenaj, 2015; Brusov et al., 2011).

Trade-Off Theory

The trade-off theory of capital structure seeks to clarify the manner in which enterprises often get funding via a combination of loans and equity. The trade-off hypothesis posits that there are advantages associated with using debt as a means of financing, such as the tax shield benefit and agency benefit. Conversely, there are also drawbacks to funding via debt, including the expenses of financial distress and agency costs. Hence, the corporation that aims to optimize its value would prioritize the evaluation of costs and advantages associated with debt when determining the optimal mix of debt and equity for funding its operations (Abdeldayem & Assran, 2013; Hackbarth et al., 2007).

Pecking Order Theory

This theory, as developed by Myers (1984), argues that corporations tend to prioritize financing new projects via internal resources rather than external financing options. The company first utilizes internally generated cash, such as retained profits, followed by debt financing, and only considers issuing stock as a last option (Ahmadimousaabad et al., 2013).

Market timing theory

This capital structure theory, states that the efforts of management to "time" the issuance of equity relate to the firm's capital structure. This theory further implies that firms will raise capital by issuing equity in hot equity markets but will issue debt in cold equity markets (Agyei et al., 2020; Alti, 2006).

Different Studies

Different scholars and researchers have adopted the capital structure theories of listed firms on various stock exchanges in developed and developing countries. In previous articles, different proxies were used to adapt the theories, but for adapting the market timing theory, researchers, along with other proxies, most commonly used proxy were the market-to-book ratio (Baker & Wurgler, 2002; Halil, 2011; Harris & Raviv, 1991; Myers, 1984; Yapa Abeywardhana, 2017).

3. Research Methodology

Generally, the financial sector consists of banks and non-bank financial institutions. Non-bank financial institutions offer various banking services but do not have a banking license. Casinos and card clubs, securities and commodities firms (e.g., brokers/dealers, investment advisers, mutual funds, hedge funds, or commodity traders), money services businesses (MSB), insurance companies, finance institutions, operators of credit card systems, and so on are included in non-bank financial institutions. The theory's applicability has been tested in non-bank financial institutions, generally in stock markets and most specifically in the context of Canadian firms (Şahin & Humta, 2023).

According to market timing theory, a high ratio of MTB encourages companies to issue new equity for financial financing. To empirically evaluate the market timing theory in the Canadian capital market, a model was constructed using factors that influence the capital structure of Canadian firms. One such variable is the market-to-book ratio, which is used as a proxy for market timing behavior. The data used in this study was obtained from the financial statements of Canadian companies with listings during the period of 2022. A sample of 20 firms was chosen randomly from the FINVIZ website (*finviz*, 2022), ensuring that these organizations had complete data available for the specified

period. The hypotheses of the research were conducted. Some statistical tests and models were run through EViews 13, including descriptive statistics, correlation, a generalized linear model once for market leverage as a dependent variable, and another for book leverage as a dependent variable. Based on the study of the research, firstly identified the variables, and then developed the hypothesis as follows:

Research Variables

In this study, dependent, independent, and controlled variables are used.

Dependent Variables: Market Leverage (MLEV) and Book Leverage (BLEV)

Market leverage (MLEV) is defined as book debt divided by the result of total assets minus book equity plus market equity (Abdeldayem & Assran, 2013).

Book Debt= Total liabilities = Current liabilities + Long Term Debt
Book Equity = Total assets - Total liabilities
Market Equity = Market Capitalization= Common Shares Outstanding x Price
(MLEV= BD/ (TA- (BE + ME))
Book leverage (BLEV) is measured by total debt divided by total assets (De Bie & De Haan, 2007). BLEV= TD/TA.

Independent Variable: Market to Book Ratio (MTB)

Market-to-Book Ratio (MTB) is measured by the market value of assets (book value of assets minus book value of equity plus market value of equity) divided by book value of assets. Market value of equity is stock price multiplied by shares outstanding (Allini et al., 2018).

Controlled Variables: Current Ratio (CR), Profitability (PROF) and Total Assets (TA)

Current Ratio (CR) is the ability of a company to meet its short-term obligations promptly.
Profitability (PRO) is defined as earnings before interest and corporate taxes divided into total assets.
Total assets (TA) are the sum of total capital plus total liability.

Research Hypothesis

According to research, such developed hypotheses are as follows:

- H1: The current ratio and market leverage of a corporation are directly related to psychological significance.
- H2: The current ratio and book leverage of a corporation are directly related to psychological significance.
- H3: The total assets and market leverage of a corporation are directly related to psychological significance.
- H4: The total assets and book leverage of a corporation are directly related to psychological significance.
- H5: The probability and market leverage of a corporation are indirectly related to psychological significance.
- H6: The probability and book leverage of a corporation are indirectly related to psychological significance.
- H7: The MTB and market leverage of a corporation are indirectly related to psychological significance.
- H8: The MTB and book leverage of a corporation are indirectly related to psychological significance.

4. Finding and Results

Descriptive Statistics

The study's descriptive statistics indicate that book leverage (BLEV) reflects a range of values from 0.6% to 433%. This suggests that most of the sampled Canadian corporations rely extensively on debt as a means of financing. Market leverage (MLEV) varies between -110 and 376%, where MLEV is smaller than BLEV. This means that the average market value of a company's share is greater than the book value. This difference is clearly shown by the mean of MTB (1.737) ratio.

Table 1. Descriptive Statistics

	BLEV	CR	MLEV	MTB	PROF	TA
Mean	0.747300	13.17050	0.692500	1.737500	-0.564450	842.6270
Median	0.415000	4.030000	0.090000	0.755000	-0.075000	195.8200
Maximum	4.330000	124.9000	3.760000	10.95000	0.260000	5607.040
Minimum	0.006000	0.450000	-1.100000	-0.580000	-7.360000	1.190000
Std. Dev.	0.994635	27.59393	1.323428	3.129486	1.661059	1387.750

Skewness	2.603458	3.559634	1.159063	2.324079	-3.676904	2.305634
Kurtosis	9.645159	14.92229	3.597058	7.010338	15.54086	8.052439
Jarque-Bera	59.39175	160.6876	4.775155	31.40682	176.1263	38.99244
Probability	0.000000	0.000000	0.091852	0.000000	0.000000	0.000000
Sum	14.94600	263.4100	13.85000	34.75000	-11.28900	16852.54
Sum Sq. Dev.	18.79669	14467.07	33.27778	186.0800	52.42322	36591136
Observations	20	20	20	20	20	20

Correlation Matrix

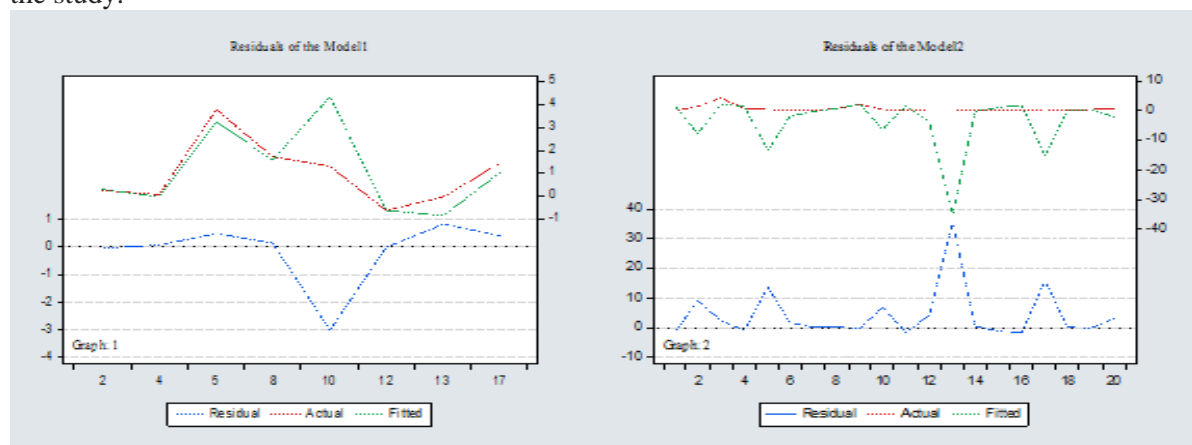
For testing the multicollinearity between the variable, the correlation matrix took place in table 2. Table 2 presents the results of our study, indicating a modest correlation between the variables. The highest observed correlation coefficient, amounting to 42%, is observed between the total asset (TA) of company and market to book ratio (MTB). The value in question does not have any impact on the outcomes of the assessment. According to Sultan (1998), it is necessary to establish the presence of a multi-correlation problem between variables by ensuring that the correlation coefficient value exceeds 70%. Therefore, based on the findings presented in Table 2, it can be argued that there is no evidence of multicollinearity among the variables examined in this study.

Table 2. Correlation Matrix

	BLEV	CR	MLEV	MTB	PROF	TA
BLEV	1.000000	-0.244547	0.119434	-0.222221	-0.451597	-0.095739
CR	-0.244547	1.000000	-0.049700	-0.140914	0.137121	-0.210053
MLEV	0.119434	-0.049700	1.000000	-0.232611	0.013661	0.142706
MTB	-0.222221	-0.140914	-0.232611	1.000000	-0.027641	0.420640
PROF	-0.451597	0.137121	0.013661	-0.027641	1.000000	0.260414
TA	-0.095739	-0.210053	0.142706	0.420640	0.260414	1.000000

Residuals of the Econometric Model (1) & (2)

For the applicability of the market timing theory, two models were determined by differentiating the dependent variable once market leverage and the other book leverage while the independent and controlled variables remained unchanged. The below graph (1) and graph (2) shows the residuals of the model (1) and model (2). Due to the graphs, both models are validated and fitted for the study.



Graph: (1) & (2) Residuals of the Model

Empirical Models

The regression of model (1) or Table (3) explores independent variables (MTB, CR, and TA) have a statistically significant negative relationship with market leverage (MLEV), while profitability has a positive effect on market leverage. This impact shows that (MTB, CR, TA, and PROF) is essential for explaining the capital structure.

$$MLEV = \beta_0 + \beta_1 * MTB + \beta_2 * PROF + \beta_3 * CR + \beta_4 * TA \text{ (Model No: 1)}$$

Table 3. Regression of Model (1)

Dependent Variable: MLEV				
Method: Generalized Linear Model (Newton-Raphson / Marquardt steps)				
Sample (adjusted): 2 17				
Included observations: 8 after adjustments				
Family: Normal				
Link: Identity				
Predetermined weights: PROF				
Weight type: Standard deviation (average scaling)				
Dispersion computed using Pearson Chi-Square				
Convergence achieved after 1 iteration				
Coefficient covariance computed using the Huber-White method with observed Hessian				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	1.483620	0.265204	5.594266	0.0000
MTB	-0.546782	0.067648	-8.082756	0.0000
CR	-0.111457	0.016368	-6.809623	0.0000
PROF	24.75497	6.180272	4.005482	0.0001
TA	-0.000543	0.000136	-3.999195	0.0001
Weighted Statistics				
Mean dependent var	0.125109	S.D. dependent var	66.91727	
Sum squared resid	10.35004	Root MSE	1.137433	
Log likelihood	-3.587061	Akaike info criterion	2.146765	
Schwarz criterion	2.196416	Hannan-Quinn criter.	1.811889	
Deviance	0.003561	Deviance statistic	0.001187	
Restr. deviance	0.083295	LR statistic	67.17772	
Prob (LR statistic)	0.000000	Pearson SSR	0.003561	
Pearson statistic	0.001187	Dispersion	0.001187	
Unweighted Statistics				
Mean dependent var	0.972500	S.D. dependent var	1.397679	

Model (2) or table (4) explores independent variables (MTB and CR) have a statistically significant negative relationship with market leverage (BLEV), while profitability (PROF) and total asset (TA) has a positive effect but not significantly on market leverage. The insignificant effect can't be considerable in decision making process in terms of financing for company.

Each model explores the negative correlation between the MTB ratio and capital structure. This aligns with the core concepts of the Market Timing Theory, where the theory posits that firms tend to issue more equity when their valuations are high, and as a result, their leverage will decrease. Conversely, if the valuations are low, companies are going to liquidate their shares.

$$BLEV = \gamma_0 + \gamma_1 * MTB + \gamma_2 * PROF + \gamma_3 * CR + \gamma_4 * TA \text{ (Model No: 2)}$$

Table 4. Regression of Model (2)

Dependent Variable: BLEV			
Method: Generalized Linear Model (Newton-Raphson / Marquardt steps)			
Included observations: 20			
Family: Normal			
Link: Identity			
Predetermined weights: TA			
Weight type: Standard deviation (average scaling)			
Dispersion computed using Pearson Chi-Square			
Convergence achieved after 1 iteration			
Coefficient covariance computed using observed Hessian.			

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	2.302212	0.715651	3.216950	0.0013
MTB	-0.182299	0.059183	-3.080247	0.0021
CR	-0.016804	0.005756	-2.919613	0.0035
PROF	-0.013157	0.089019	-0.147796	0.8825
TA	-0.006367	0.007898	-0.806191	0.4201
Weighted Statistics				
Mean dependent var	0.026297	S.D. dependent var	76.76599	
Sum squared resid	1896.375	Root MSE	9.737492	
Log likelihood	-55.92910	Akaike info criterion	6.092910	
Schwarz criterion	6.341843	Hannan-Quinn criter.	6.141505	
Deviance	0.255095	Deviance statistic	0.017006	
Restr. deviance	1.348477	LR statistic	64.29272	
Prob (LR statistic)	0.000000	Pearson SSR	0.255095	
Pearson statistic	0.017006	Dispersion	0.017006	
Unweighted Statistics				
Mean dependent var	0.747300	S.D. dependent var	0.994635	

Testing the Research Hypothesis

Each table shows that MTB has a statistically significant negative relationship with market and book leverages, according to moral significance.

Table 5. Market Leverage vs Independent and Controlled Variables

Market Leverage	Variables	Relationship According to Moral Significance	Coefficient	P-Value	Status
Market Leverage	Current Ratio	Direct	-0.1110	0.000	Rejected
Market Leverage	Total Asset	Direct	-0.0005	0.001	Rejected
Market Leverage	Probability	Indirect	24.754	0.001	Rejected
Market Leverage	Market To Book Ratio	Indirect	-0.5460	0.000	Accepted

Table 6. Book Leverage vs Independent and Controlled Variables

Book Leverage	Variables	Relationship According to Moral Significance	Coefficient	P-Value	Status
Book Leverage	Current Ratio	Direct	-0.0160	0.003	Rejected
Book Leverage	Total Asset	Direct	-0.0060	0.420	Rejected But Not Significant
Book Leverage	Probability	Indirect	-0.0130	0.882	Accepted But Insignificant
Book Leverage	Market To Book Ratio	Indirect	-0.1820	0.002	Accepted

5. Conclusions and Discussion

This study aims to demonstrate the applicability of market timing theory to the stock exchange in the context of Canadian firms. The actual market-to-book ratios represent short-term market timing effects; therefore, this research concludes that if the market value is greater than the book value, in this case, the corporation will issue new equities for fundraising or financing; inversely, if the book value is bigger than the market value, the valuation will go down, and the corporation will resell the equities, but keep in mind that other variables are assumed to be constant. This result of the study is in line with (Allini et al., 2018; Huang & Ritter, 2005; Setyawan, 2015). The small sample

size of the research, either for firms, years, or countries, caused the limitation in examining the short-run effect, while the persistence effects were required because optimal capital structure decisions are long-term decisions and can be used in different academic research methodologies in distinct stock markets (Setyawan, 2012).

Researchers may also combine multiple capital structure theories to interpret companies' financial decisions in Canada and elsewhere. A comparative study of testing (MTT) is needed in Gulf countries because there is a gap in research. Respected researchers may answer the question in future research to fill the literature gap: Will capital structure theories be applicable in the Islamic stock market, commonly in the Islamic stock index? And lastly, future research may be considered in debt market timing.

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