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PROVIDING PERFORMANCE BUSINESS ACTIVITY IN CANADIAN COMPANIES

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Summary. *This publication investigated the impact of capital structure choice on firm performance activity in Canada.*

Short-term, long-term and total debt ratios were employed as capital structure determinants.

In order to estimate regression properly, control variables were taken, such as firm size, growth, asset tangibility and turnover ratios.

Measuring the business activities effectiveness in Canadian firms was performed using the following indexes: return on assets (ROA), return on equity (ROE), and market-based measure (Tobin's Q).

According to the results of the regression analysis, it was installed that in Canada capital structure does not impact on ROE; capital structure has an impact on ROA and Tobin's Q.

Proposed approach will allow increasing the management effectiveness in Canadian companies.

Keywords: *Canada, company, short-term, long-term and total debt ratios, return on assets, return on equity, and market-based measure.*

Аннотация. *Исследовано влияние выбора структуры капитала на эффективность хозяйственной деятельности предприятий в Канаде. Краткосрочные, долгосрочные и общие коэффициенты задолженности были использованы как детерминанты структуры капитала. Для оценки регрессии были введены контрольные переменные, такие как: размер предприятия, рост, чувствительность активов и коэффициент их оборачиваемости. Измерение эффективности хозяйственной деятельности предприятий в Канаде выполнялось с помощью таких коэффициентов, как рентабельность активов (ROA), рентабельность капитала (ROE) и рыночная стоимость (Тобина Q). По результатам регрессионного анализа установлено, что в Канаде структура капитала предприятий не влияет на ROE; структура капитала влияет на ROA и Тобин Q. Предложенный подход позволит повысить эффективность управления и хозяйственной деятельности в канадских компаниях.*

Ключевые слова: *Канада, предприятия, краткосрочные, долгосрочные и общие коэффициенты задолженности; рентабельность активов; рентабельность капитала; рыночная стоимость.*

Problem statement in general and its connection with important scientific and practical tasks. Since the late 50s in the 20th Century, the relationship between firms' capital structure choice and performance has been considered a topic of great debate in corporate finance. From a practice point of view, capital structure choice and the results of business activity are due to company managers, as their main task is to increase a firm's value and its shareholders' wealth. To fund their investments and operations, firms have two main sources of finance. Internal sources include retained earnings, common and preferred equity issuance and reserves. As an alternative financing source, external sources consist of bond issuance and borrowing (short-term and long-term).

Analyzing of the recent researches and publications, in which scientists began to solute this problem and on which relies the authors. The discussion about the relationship between capital structure and firm performance was sparked by the Bigelli M. [1] theory concerning the irrelevance of capital structure to firm value relations. They together laid the foundation of the modern theory of capital structure, which was the basis for further discussion of corporate finance theory. This theory claims that capital structure is irrelevant when determining firm value, if we hold the assumptions of a frictionless world where there are no taxes, no transaction costs, perfect competition and other imperfections [8].

According to this theory, in perfect capital markets the value of the firm is equal to its total assets and is not affected by its capital structure choice. In the opposite case, investors can enjoy arbitrage opportunities.

After five years, the authors reviewed the theory again and a number of market imperfections were taken into account. Making a "correction" to the previous theory, they stated that because tax deductibility debt offers a tax shield, capital structure does play a role in firm value determination [12].

However, this proposition was not accepted as absolute truth, as for example, Haizhi Wang and Kim Dong-Hyeon [3; 5] argue that the M&M theory cannot be applied in practice because it neglects bankruptcy costs.

In stating the trade-off theory, Kayhan A. and Rossi Matteo [4; 11] take a different approach to explaining capital structure choice impact on firm value.

They state that as firms have different financing alternatives, they assess those alternatives in order to find the right balance. Trade-off theory divides into static and dynamic trade-off theories and further discussion on these will be presented in the Literature Review.

Mani Yostra [9] pecking order theory suggests that due to information asymmetry firms prefer internal sources first, following by debt and then equity as a last resort. Tse Chin-Bun [13], however, give four justifications of the importance of firm performance and debt levels which can be considered general reasons. First, when debt levels increase substantially this has an impact on the performance of company. Secondly, because managers and investors have different emphases, the effect of debt must be known. Thirdly, owner investors must know the relative strengths of debt, because they anticipate benefits which cannot be observed using traditional performance measures. The final reason is that because the manager's primary goal is to maximise shareholders' wealth, the association between firm performance and debt must be studied [14].

Identification the unresolved parts of general problem, which this publication is devoted. Because the goal of this publication is examine the association between capital structure and firm performance in Canadian companies, for the purpose of this analysis the regression method applied is the Ordinary Least Squared. The accounting-based measures employed for firm performance are return on assets (ROA), return on equity (ROE), and market-based measure Tobin's Q. As the definition of capital structure is broad, relevant papers on short-term debt, long-term debt and total debt are considered reliable indicators. The results achieved are in part consistent with the results of scholars, but in some cases do not support previous empirical research.

Formation the aim of this publication. In writing this publication, the aim is to provide a better understanding of the capital structure and firm performance of Canadian companies.

The current trend of relevant research shows that scholars attempt to investigate capital structure and firm performance in relation to developing and emerging markets, and here the author will conduct a similar investigation for Canadian companies.

Presentation of the main research material with full justification of received scientific results. This analysis is conducted on the basis of financial data from Standard & Poor's/Toronto Stock Exchange (S&P/TSE) Composite Index listed companies. According to the official web page, S&P/TSE is considered a headline of Canadian equity markets. The data is extracted from Standard & Poor's Compustat database platform for the period 1999—2017 [15].

The main sources of data are annual financial reports which are used to calculate book and market-based variables. S&P/TSE is the main index for Canadian capital markets.

The index comprises 251 companies in the TSE and means the data captures the most liquid companies in Canada. Due to missing data, the number of companies is reduced to 247. The companies represent different types of industries and the chart below describes industry shares in terms of percentage.

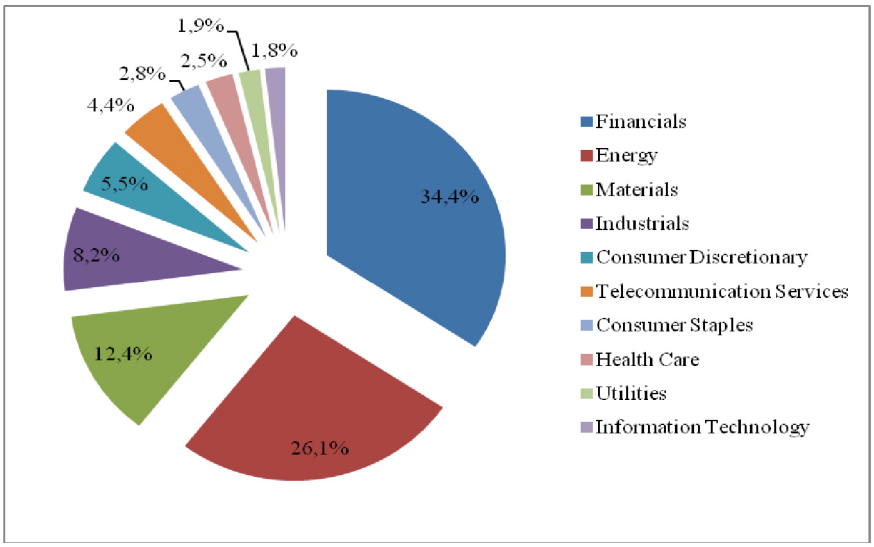

Fig. The types of industries in Canadian companies

Source: Chart extracted from S&P/TSX webpage.

Komakech Samuel [6] "capital structure puzzle" indicates which proportion of debt should be used within capital structure. The "puzzle" also explores ways of measuring debt. Previous studies by Abor, which analyse Nigerian markets, suggest three different measures [10]:

- Short-term debt to total assets;
- Long-term debt to total assets;
- Total debt to total assets.

The analysis here is extended to determine performance measures after clarifying financial leverage measures. In line with previous studies, the following performance measures will be used:

- Return on assets (ROA): calculated as the ratio of net profit to total assets (Tani, 2013). It should be noted that in corporate finance literature there are other approaches for defining return on assets, such as return on net worth [2];
- Return on equity (ROE): following Li Peixin [8] and Tan Zhibo [12], this is calculated as net profit to book value of owner equity. Here there are also different approaches, for example, Mihaela BrindusaTudose [10] prefers EBIT (not net income) divided by equity;
- Tobin's Q: as a market-based measure this is calculated as the market value of total assets divided by the book value of total assets [7].

The intuition in using these three corporate profitability indicators can be explained as follows: the return on assets indicates the level of effectiveness of using a firm's assets.

As data from S&P/TSE listed companies are used for the purpose of this study, return on equity is employed to examine how the shareholders' contribution to the company is effective. Finally, as these two measures are account-based, inclusion of a market-based measure is a wise idea as market value does not always coincide with book value. In summary, the intention is to cover all aspects of corporate profitability [4].

To eliminate overestimation of the impact of financial leverage on profitability, additional and control variables which also influence performance are employed. Prior research suggests some control variables to use, such as firm size, which is measured by a log of total assets [6]. Firm growth denotes the annual percentage change in the book value of total assets [9].

Ordinary Least Squares (OLS) will be performed to estimate regression and the results will then be interpreted. The regression model suggested by Le Thi Phuong Vy [7] is adopted with a slight modification to suit the researcher's needs. The model is as follows:

$$\text{Performance}_{i,t} = b_o + b_1\text{Leverage}_{i,t} + b_2\text{Controls}_{i,t} + e_{i,t}. \quad (1)$$

As an independent variable notation *Performance* indicates ROE, ROA and Tobin's Q. As a notation of independent variables *Leverage* represents leverage proxies and *Controls* represents the vector of control variables. As panel data is used for the purpose of this study, subscripts i and t appear in the model denoting firm and time, respectively (*table 1*).

Table 1

Contains the result of descriptive statistics of 3147 variables

Index	Mean	Descriptive Statistics				
		Median	Max	Min	Std. Dev.	Number
ROA	0.060	0.034	0.949	-83.458	1.504	3147
ROE	0.075	0.101	6.612	-5.892	0.402	3147
Tobin's Q	1.654	1.289	83.619	0.004	2.488	3147
STDTA	0.043	0.012	13.389	0.000	0.251	3147
LTDTA	0.204	0.184	6.837	0.000	0.212	3147
TDTA	0.226	0.200	13.389	0.000	0.325	3147
Growth	0.981	0.079	1071.179	-1.000	21.624	3147
Firm Size	7.656	7.575	13.668	-3.324	2.037	3147
Tangibility	0.887	0.972	1.000	0.086	0.176	3147
Turnover	0.622	0.374	6.957	-0.117	0.701	3147

Giving the opportunity to reduce data multicollinearity, increase the degree of freedom and lessen estimation bias, panel data is an appropriate method for the purpose of this study A. Kayhan [4].

A. Kayhan [4] argues that panel data accepts economic models and treats economic hypotheses differently according their features.

Different models will be constructed for each performance indicators and for each model one leverage proxy will be included separately. As all control variables are in the same category, they will be included at the same time.

While measuring the different impact of these three leverage proxies, the sustainability of the findings will be checked.

As can be seen, the analysis of the target population shows that the mean (median) of ROE, ROA and Tobin's Q is 0.075 (0.101), 0.06 (0.034) and 1.654 (1.289) respectively.

The result of ROE shows that Canadian companies performed better in comparison to ROA during 2002—2017.

However, the high Tobin's Q mean reveals that the market value of companies is greater than their book value. As their market to book value is greater than 1, we can expect these firms to grow in the future.

The maximum (minimum) values for ROA, ROE and Tobin's Q are 0.949 (-83.458), 6.612 (-5.892) and 83.619 (0.004), respectively. The negative values indicate there are companies which operated at a loss during 2002—2017.

The mean of short-term debt to total assets and long-term debts to total assets is 0.043 (0.012) and 0.204 (0.184), respectively. This confirms that Canadian companies rely more on long-term debts than short-term, or they prefer long-term debts to short-term liabilities.

As the mean (median) of total debts to total assets ratio is 0.226 (0.2), this suggests that about 23 % of the total assets of Canadian companies are financed by debt. It can be concluded therefore that Canadian companies operate with a moderate level of leverage and which means that financial leverage is not so high.

As the *table 1* shows, the main share of debt comes from long-term debts and the current liabilities contribution is too low.

Canadian firms have high asset tangibility with a mean (median) of 0.887 (0.972). In summary, almost 89 % of assets are fixed assets.

The mean of firm size and turnover is 7.656 and 0.622, respectively.

The mean growth (0.981) shows that during 2002—2017 Canadian listed companies performed with a high growth rate and so sound development can be noted.

Table 2 describes the correlation between the variables under examination for the purpose of checking multicollinearity. The second aim of this section is to give a brief explanation of the results of significance levels.

As shown in the *table 2*, ROA is negatively correlated with all independent variables, at 1 % confidence level with short-term debt to total assets and total debt to total assets, but at 5 % confidence level with long-term debts to total assets. Generally, there is a positive correlation between ROA and firm size, asset turnover and firm growth, except asset tangibility.

Table 2

Correlation Analysis

Index	Correlation Matrix									
	ROA	**TQ**	**ROE**	**STDTA**	**LTDTA**	**TDTA**	**Firm Size**	**Growth**	**Tan-gib.**	**Tur-nover**
ROA	1									
	0*									
TQ	-0.232	1								
	0*									
ROE	-0.247	0.139	1							
	0*	0*								
STDTA	-0.348	0.287	0.28	1						
	0*	0*	0*							
LTDTA	-0.022	-0.001	0.016	-0.003	1					
	0.034**	0.977	0.382	0.864						
TDTA	-0.512	0.114	0.22	0.707	0.671	1				
	0*	0*	0*	0*	0*					
Firm size	0.104	-0.264	0.125	-0.086	0.036	-0.038	1			
	0*	0*	0*	0*	0.046**	0.032**				
Growth	0.002	-0.002	-0.005	-0.001	-0.023	-0.017	-0.023	1		
	0.082***	0.923	0.800	0.968	0.144	0.346	0.206			
Tangib.	-0.021	0.034	-0.02	0.035	-0.077	-0.04	-0.037	0.021	1	
	0.247	0.056***	0.260	0.052***	0*	0.025**	0.039**	0.249		
Turnover	0.008	0.006	0.084	0.013	-0.025	-0.007	-0.096	-0.026	-0.188	1
	0.065***	0.045**	0*	0.459	0.157	0.711	0*	0.144	0*	-

Note: The signs (*), (**), (***) denote significance level at 1%, 5% and 10% respectively.

Tobin's Q is positively correlated with short-term debt to total assets and total debt to total assets at 1 % significance level, but significance correlation does not exist with long-term debts to total assets. However, significant correlation between tangibility and turnover ratio with Tobin's Q is positive, but negative correlation appears with firm size and growth.

A positive correlation between ROE and STDTA and TDTA exists at 1 % significance level, while there is no significant correlation of ROE with the LTDTA variable. In contrast, ROE is negatively correlated with firm growth and asset tangibility, while correlation with firm size and asset turnover is positive. As all correlation coefficients among variables are less than 0.8, there is no severe multicollinearity for the target data. The same can be said for the data in this study, as all correlation coefficients are below 0.8 [14].

The aim of running the Hausman test is to find whether the Fixed or Random Effects Model is appropriate for the panel data. The Hausman test trials the following hypotheses: H0: Random Effects Model is appropriate for study panel data; H1: Fixed Effects Model is appropriate for study panel data. At the 1 % significance level the null hypothesis was rejected and Fixed Effects Model was preferred to Random Effects Model for ROA testing models. However, due to the nonsignificant p-value, the Random Effects Model was applied to the ROE and Tobin's Q models (except in the case where the model tests total debt ration relationship with Tobin's Q).

In order to reveal whether the variables have unit root or not, the Fisher-type Dickey Fuller test was carried out in Haizhi Wang [3] and Mani Yostra [9]. According to the results of this test, the variables do not have unit root, so we can continue without first difference.

This section aims to present information on the empirical findings in a structured way. The models will be constructed to test regression of STDTA, LTDTA and TDTA ratios on corporate performance indicators separately with other control variables. First, the main sample study data will be tested. Then the same approach will be applied to data for classification of companies on the basis of firm size and growth proxies. As mentioned in previous chapters, to examine the impact the Ordinary Least Squares model is employed throughout 2002—2017.

Table 3 shows the results of regression analysis for ROA as a performance measure and STDTA, LTDTA and TDTA as capital structure measures.

As shown, there are negative relationships between long-term debt and total debt ratios and ROA at 99 % confidence level.

However, the negative relation between short-term debt ratio and ROA is at 90 % confidence level and is considered significance. It can be interpreted, therefore, that the more debt in capital structure, the lower company performance. In terms of the figures it means that if STDTA and LTDTA increase by 1, ROA will decrease by 2.7 % and 7.4 % respectively. However a TDTA increase by 1 will have a more robust affect on ROA at almost 10 %.

Table 3

Return on Assets (ROA)

Index	ROA		
	Model 1	**Model 2**	**Model 3**
Constant	-3.064	-3.142	-3.149
	0.000*	0.000*	0.000*
STDTA	-0.027		
	0.077***		
LTDTA		-0.074	
		0.002*	
TDTA			-0.099
			0.000*
Firm Size	0.057	0.080	0.073
	0.083***	0.008*	0.014**
Firm Growth	0.033	0.043	0.041
	0.020**	0.001*	0.002*
Tangibility	0.775	0.765	0.685
	0.000*	0.001*	0.000*
Turnover	0.717	0.827	0.809
	0.000*	0.000*	0.000*
R-squared	0.610	0.607	0.605
Adjusted R-squared	0.540	0.548	0.545

Note: The signs (*), (**), (***) denote significance level at 1%, 5% and 10% respectively.

R-squared of the regression for all three models is around 60 % and it can be concluded that the independent variables have sufficient explanatory power to interpret variations of return on assets.

Lastly, the results prove that the performance measure (ROA) has significant positive relations with control variables, such as firm size, growth, tangibility and asset turnover. This means that when debt increases, the performance of the firm shows the inverse trend (decreases). Due to the hypothesis it is particularly worth emphasising firm size's positive effects at 99 % confidence level for all three models. Furthermore, the evidence shows that asset tangibility ratio and turnover factors' influences on performance measures are stronger than others. This means that Canadian companies which own more fixed assets make better gains in business activity. On the other hand, the intensity of revenues plays a crucial role in achieving profit, among others. This view is in line with the findings of Mihaela Brindusa Tudose [10]. He concludes that firm size and growth factors create a good opportunity to generate profit and for this reason their contribution to corporate performance is important. The same result can be applied to the growth factor's influence on profit measured by ROA. According to *table 4*, which presents the analysis of testing three models, all debt ratios (short-term, long-term and total) have no significant relationship with the performance measure (ROE).

Table 4

Return on equity (ROE)

Index	ROE		
	Model 1	**Model 2**	**Model 3**
Constant	0.004	0.001	0.001
	0.771	0.886	0.907
STDTA	0.001		
	0.507		
LTDTA		0.001	
		0.425	

Continued tabl. 4

Index	ROE		
	Model 1	**Model 2**	**Model 3**
TDTA			0.002
			0.359
Firm Size	-0.006	0.000	0.000
	0.662	0.820	0.875
Firm Growth	0.996	0.997	0.997
	0.000	0.000	0.000
Tangibility	0.012	-0.008	-0.001
	0.216	0.324	0.329
Turnover	0.000	0.001	0.001
	0.890	0.746	0.755
R-squared	0.996	0.996	0.996
Adjusted R-squared	0.996	0.996	0.996

All of these models show that the independent variables and ROE as dependent variable are not significant in terms of coefficients. The same non-significant relationship can be applied to the impact of some control variables (firm size, asset tangibility and turnover ratios) on ROE. Only firm growth association with ROE is statistically significant at 99 % confidence level. Due to the aforementioned results, it is not worth continuing with further analysis, such as R-squared and so on. It can be concluded that the return earning from Canadian companies' equities cannot be explained by capital structure factors. A firm size has a strong inverse influence on the corporate performance measure by Tobin's Q when it is tested with the short and long-term debt ratios at 99 % confidence level. However, as the *table 5* presents, the same significant relationship does not appear in the model for total debt's influence on performance. This does not support the documentation of M. Bigelli [1], who claim that Tobin's Q is positively affected by firm size in Amman Stock Market listed companies.

Table 5

Tobin's Q

Index	Tobin's Q		
	Model 1	**Model 2**	**Model 3**
Constant	0.742	0.679	0.481
	0.000	0.000	0.000
STDTA	-0.022		
	0.000		
LTDTA		-0.046	
		0.000	
TDTA			-0.060
			0.000
Firm Size	-0.051	-0.044	-0.019
	0.000	0.000	0.119
Firm Growth	0.018	0.015	0.018
	0.002	0.004	0.009
Tangibility	0.103	0.060	0.182
	0.079	0.253	0.025
Turnover	0.077	0.068	0.062
	0.000	0.000	0.004
R-squared	0.051	0.050	0.536
Adjusted R-squared	0.048	0.048	0.472

All other control variables, except the asset tangibility ratio for short-term debt influence model, have a strong positive association with performance.

Only in the model for testing short-term debt influence on performance is asset tangibility influence on Tobin's Q not statistically significant. The R-squared for total debt ratio impact on Tobin's Q is around 54 % and which means that the independent variables can measure the regression at an appropriate level (closeness of fit). However, R-squared indicators of models (for short-term and long-term debt ratios) show that the independent variables do not have explanatory power to reveal the changes of the dependent variable at an appropriate level.

Conclusions from this research and prospects for further development in this direction. This publication investigated the impact of capital structure choice on firm performance. For the purpose of this publication, short-term, long-term and total debt ratios were employed as capital structure determinants. In order to estimate regression properly, control variables were taken, such as firm size, growth, asset tangibility and turnover ratios. Performance measures were introduced through ROA, ROE and Tobin's Q. The findings of the research can be grouped as follows:

- Capital structure does not impact on ROE;
- Capital structure has an impact on ROA and Tobin's Q.

For purpose of conducting broader analysis and measuring the result at an appropriate level, subsamples were created on the basis of firm growth, leverage and time dummies.

The financial mechanism of companies is realized through the development and implementation of strategic and operational financial decisions. Financial strategy provides for other functional strategies and plays an important role in enhancing the competitiveness of companies, ensuring the effective engagement and use of party facilities, coordination of their flow, which ultimately ensures the growth of the companies market value and wealth of its owners. Developing financial strategy should be based on financial indexation system of the companies, the implementation of which in the strategic period will allow achieving their goals, achieving competitive advantage, and increasing the market value of the company.

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