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Financial Factors Affecting Price-to-Earnings Ratios in Canada

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ABSTRACT

Purpose: The purpose of this study is to ascertain which financial factors affect the price-to-earnings ratios of Canadian firms.

Methodology: A sample of 578 Canadian firms, across 11 industries, listed on the Toronto Stock Exchange during 2011 to 2018 is examined. Stock prices and financial statements accounts data is collected from S & P Capital IQ. We compute 27 financial factors to use as independent variables to regress on the price-to-earnings ratio dependent variables employing the Statistical Package for Social Sciences (SPSS) utilizing the software program's forced, forward, and backward selection methods. Robustness tests are conducted using alternative dates (after the fiscal year end) to discover which model of financial factors best explains the forward price-to-earnings ratio as well as other statistical methods such as analysis of variance.

Results: We find a unique model for each of the 3 models based on the forward price-to-earnings ratio date. The financial factors that explain each of the dates after the end of the fiscal year (1 month, 2 months, and 3 months) are the 4 variables: net profit margin, return on investment, total asset turnover, and the natural logarithm of the total assets. For model 3 (1 month after fiscal year end), in addition to the previous 4 factors, the dividends per share is part of the regression equation. All 3 models have strong statistically significant results at an alpha level of one percent. Further, industry effects are deduced and presented.

Unique contribution to theory, policy, and practice: The results are unique to a Canadian sample of firms post- International Financial Reporting Standards (IFRS) adoption. Companies can utilize the empirical findings to manage their financial performance to maximize their price-to-earnings ratio. A product of a firm's higher price-to-earnings ratio is a lower cost of capital which expands the corporation's investment opportunities. Investors can apply this research to develop investment strategies hinged on price-to-earnings ratios to augment investment returns.

Keywords: *Financial factors, Price-to-Earnings Ratios, Canada*

INTRODUCTION

Investors continue to search for superior returns in their pursuit of wealth accumulation. In recent years, the low interest environment has made fixed income securities in both the money and bond markets a dismal outlet to invest. This scenario has motivated individuals and portfolio managers

to channel their funds into the equities market. Equity strategies can be passive, such as investing in stock market index funds, or active, such as investing in growth stocks.

.One such active investment strategy, as introduced by Graham and Dodd (1934), is based on the price-to-earnings ratio (P/E; stock market price per share divided by the annual accounting earnings per share (EPS)) to value which stocks to invest in. As Basu (1977) has mentioned, "publicly available P/E ratios seem to possess 'information content' and may warrant an investor's attention at the time of portfolio formation or revision." The relationship between stocks and the P/E ratios was examined by the following authors McWilliams' (1966), Basu (1977), Ikoku, Hosseini, & Okany (2010), Sezgin (2010), Bodhanwala (2014), Akhtar (2015), and Chhaya & Nigam (2015), among others. Their studies show that better investment performance can be obtained from a portfolio comprised of low P/E ratio stocks in contrast to portfolios made up of high P/E ratio stocks. This difference is known as the value premium (Anderson & Brooks, 2006), and "a phenomenon known as the P/E effect" (Ikoku, Hosseini, & Okany, 2010).

Since the P/E ratio represents an important valuation metric in selecting a stock, along with analyzing the value of the P/E ratio of a particular stock – it is important to understand the different factors that impact this ratio. We present an extensive analysis on financial factors that affect the P/E ratio. We find that the net profit margin (NPM), return on investment (ROI), total asset turnover (TAT), quick ratio (QR), natural logarithm of total assets (ln(TA)) and dividends per share (DPS) are among the most influential financial ratios on an aggregate basis.

This study contributes to the literature, focusing on a broad sample of Canadian firms during the period 2011 to 2018 after the adoption of International Financial Reporting Standards (IFRS). We chose our sample as the Canadian stock market is highly liquid, there are few capital flow restrictions making investment open to international investors, the currency is highly liquid in the spot, options, futures, forward and swap markets. Further, the post–IFRS period is adopted as more relevant to investors and firms.

Statement of the Problem

The primary goal of the firm is to increase stockholder wealth by maximizing the stock price per share. Firms require guidance on how to manage the financial statement accounts so as to optimize the stock price via the price-to-earnings ratio. More so, money managers and investors are in search of strategies to augment portfolio returns. One such strategy is to use the price-to-earnings ratio. Investors need to know which financial factors affect this ratio.

Objectives of the Study

To determine the financial factors that affect the price-to-earnings ratio for Canadian firms. The empirical results of this study will enable Canadian corporations to better manage their financial affairs to increase the price-to-earnings ratio. In addition, investors will be able to develop more effective investment strategies to elevate their Canadian stock returns.

List of Definitions/Formulas

Price to Earnings Ratio (P/E)

$$P/E\ ratio = \frac{Market\ Share\ Price}{Earnings\ per\ Share}$$

Net Profit Margin (NPM)

$$NPM = \frac{Net\ Income}{Total\ Revenue}$$

Return on Assets (ROA)

$$ROA = \frac{Net\ Income}{Total\ Assets}$$

Return on Equity (ROE)

$$ROE = \frac{Net\ Income}{Shareholders'Equity}$$

Return on Investment (ROI)

$$ROI = \frac{EBIT}{Total\ Assets}$$

Total Asset Turnover (TAT)

$$TAT = \frac{Total\ Revenue}{Total\ Assets}$$

Current Ratio (CR)

$$CR = \frac{Current\ Assets}{Current\ Liabilities}$$

Quick Ratio (QR)

$$QR = \frac{Current\ Assets - Inventory}{Current\ Liabilities}$$

Debt/Equity Ratio (D/E)

$$D/E = \frac{Total\ Liabilities}{Shareholders'Equity}$$

Natural Log of Total Assets (ln(TA))

$$ln(Total\ Assets) = log_e(Total\ Assets)$$

Earnings per Share (EPS)

$$EPS = \frac{Net\ Income}{Number\ of\ Common\ Shares}$$

Dividend Payout Ratio (DPR)

$$DPR = \frac{Dividends\ paid\ to\ stockholders}{Net\ Income}$$

Dividends per Share (DPS)

$$DPS = \frac{Total\ Annual\ Dividends}{Number\ of\ Common\ Shares}$$

Dividend Yield (DY)

$$DY = \frac{Dividends\ per\ Share}{Market\ Share\ Price}$$

Percentage Change in quantity *X* (Del(X)) is calculated as per formula

$$Del(X) = \frac{X_t - X_{t-1}}{X_{t-1}} \times 100$$

where (X_t) is the value of X for year t, and (X_{t-1}) is the value of X for year $(t-1)$.

Earnings (net income or loss) represent the periodic value (not cash necessarily) available to shareholders after expenses are subtracted from revenues.

Earnings Growth (Del (NI))

$$Del(NI) = \frac{NI_t - NI_{t-1}}{NI_{t-1}} \times 100$$

where (NI_t) is the Net Income for year t, and (NI_{t-1}) is the Net Income for year $(t-1)$.

RELATED LITERATURE AND HYPOTHESES

The set of external factors of P/E ratio investigated by other authors includes variables such as the Year in which it is measured (Anderson & Brooks, 2006; Kasilingam & Ramasundaram, 2011); the Sectors/Industries in which the company operates (Anderson & Brooks, 2006; Kasilingam & Ramasundaram, 2011); the Size of the Company (Anderson & Brooks, 2006; Kasilingam & Ramasundaram, 2011; Afza & Tahir, 2012; Faezinia, Ohadi, & Janani, 2012; Kumar & Warne, 2009; Arslan, Iltas, & Kayhan, 2017; Dutta, Saha, & Das, 2018; Fesokh & Haddad, 2019); Inflation (Faezinia, Ohadi, & Janani, 2012; Dayag & Trinidad, 2019); Interest rates (Faezinia, Ohadi, & Janani, 2012; Rahman & Shamsuddin, 2019; Dayag & Trinidad, 2019); Economic growth conditions (Kasilingam & Ramasundaram, 2011; Ramcharran, 2002; Dayag & Trinidad, 2019); and Political factors (Wisniewski, Lightfoot, & Lilley, 2012; Goodell & Bodey, 2012).

Additionally, the finance literature includes numerous empirical studies exploring the internal determinants of the P/E ratio; contributions in this respect are due to Jordan, Clark, & Donald (2009), Bhayo, Khan, & Shaikh (2011), Constand, Freitas, & Sullivan (1991), Arslan, Iltas, & Kayhan (2017), Kumar & Warne (2009), Faezinia, Ohadi, & Janani (2012), Afza & Tahir (2012), Lutfi & Arsitha (2016), Dutta, Saha, & Das (2018), Fesokh & Haddad (2019), Rahman & Shamsuddin (2019), Itemgenova & Sikveland (2020) and many other authors. These studies identify various financial ratios or accounting numbers as predictors to be the primary determinants of the P/E ratio, predictors such as earnings growth, dividend payout ratio, debt to equity ratio, percentage change in the payout ratio, return on equity, the net profit margin, percentage change in return on investment, dividend yield, accounting method used, and so on.

The country source of company data spans the globe. Numerous researchers have examined determinants of the P/E including: Pakistan (Afza & Tahir, 2012; Akhtar & Rashid, 2015); Turkey (Arslan, Iltas & Kayhan, 2017; Sezgin, 2010); Japan (Constand, Freitas & Sullivan, 1991; Marozzi & Cozzucoli, 2016); Philippines (Divanbeygi & Tehrani, 2013); Bangladesh (Dutta, Saha, & Das, 2018); Iran (Faezinia, Ohadi & Janani, 2012); Jordan (Fesokh & Haddad, 2019); G7 countries (Rahman & Shamsuddin, 2019); Indonesia (Idrus, Ali & Jusni, 2015); Nigeria (Ikoku, Hosseini & Okany, 2010); Norway (Itemgenova & Sikveland, 2020); India (Kumar& Warne, 2009); Poland (Kurach & Slonski, 2015); Global collection of Austria, Denmark, Japan, Mexico, Netherland, Norway, Spain, Sweden, and the UK (Nikbakht & Polat, 1998); China (Marozzi & Cozzucoli,

2016); Emerging Equities Markets (Ramcharran, 2002): and the US (Basu (1977), Beaver & Morse (1978), Bodhanwal (2014), Goodell & Bodey (2012), Houmes & Chira (2015), Jordan, Clark & Donald (2009), Penman (1966). The change to IFRS and its impact on financial ratios affecting the P/E ratio has been studied by Cengiz (2014), Lantto & Sahlstrom (2009), and Lueg, Punda & Burkert (2014).

There are 2 methods of calculating a P/E ratio: 1. Trailing P/E ratio (or historic P/E) based on the earnings per share over the past 12 months, and 2. Forward P/E ratio (or leading P/E or estimated P/E). We choose the Forward P/E ratio to align the expected EPS to the share price which is based on the expected prospects of the stock by investors and analysts. Further, the choice of Forward P/E is compatible with other researchers.

Our choice of 27 financial factors to explore their efficacy in determining P/E ratios is congruent with much of the literature in this field of study. That is, our initial list of potential financial factors (totaling 27 variables) is compiled from the statistically significant findings of the previous literature. Each financial factor may influence the price-to-earnings ratio but not significantly. Further, each variable is comprised of tradeoffs. That is, a variable can be too high or too low. For example, if the total asset turnover (TAT) is high it is considered good as high sales are generated with a low amount invested in assets. However, the high TAT may come at the expense of premature wearing out of fixed assets and frequent stockouts of inventory in current assets. On the other hand, a low TAT is typically viewed as poor management. Nonetheless, the low TAT may have been caused by constructing a state-of-the-art technology factory with economies of scale for sales expansion and low-cost delivery of products and heightened competitiveness. Thus, in future years the firm will increase its TAT and profitability. We show the financial variables in Table 1. Our hypothesis is:

> **H_o:** *The Forward P/E ratio is affected by the NPM, Del(NPM), ROA, Del(ROA), ROE, Del(ROE), ROI, Del(ROI), TAT, Del(TAT), CR, Del(CR), QR, Del(QR), D/E, Del(D/E), ln(TA), Del(ln(TA)), EPS, Del(EPS), DPR, Del(DPR), DPS, Del(DPS), DY, Del(DY),* and *Del(NI) financial ratios.*

In addition, we consider the influence of the industry and time (years) on the forward P/E ratios.

Table 1: **Key financial dimensions and factors**

Profitability ratios		
	1	Net Profit Margin, NPM
	2	% Change in Net Profit Margin, Del(NPM)
	3	Return on Assets, ROA
	4	% Change in Return on Assets, Del(ROA)
	5	Return on Equity, ROE
	6	% Change in Return on Equity, Del(ROE)
	7	Return on Investment, ROI
	8	% Change in Return on Investment, Del(ROI)
Asset utilization ratios		
	9	Total Asset Turnover, TAT
	10	% Change in Total Asset Turnover, Del(TAT)
Liquidity ratios		
	11	Current Ratio, CR
	12	% Change in Current Ratio, Del(CR)
	13	Quick Ratio, QR
	14	% Change in Quick Ratio, Del(QR)
Debt utilization ratios		
	15	Debt/Equity ratio, D/E
	16	% Change in Debt/Equity ratio, Del(D/E)
Other factors		
	17	Natural Log of Total Assets, ln(TA)
	18	% Change in Natural Log of Total Assets, Del(ln(TA))
	19	Earnings per Share, EPS
	20	% Change in Earnings per Share, Del(EPS)
	21	Dividend Payout Ratio, DPR
	22	% Change in Dividend Payout Ratio, Del(DPR)
	23	Dividends per Share, DPS
	24	% Change in Dividends per Share, Del(DPS)
	25	Dividend Yield, DY
	26	% Change in Dividend Yield, Del(DY)
	27	Earnings Growth (% Change in Net Income), Del(NI)

METHODOLOGY

All Canadian public firms listed on the Toronto Stock Exchange (TSX) are selected in the initial sample. Data are collected from the S & P Capital IQ database for firms who follow IFRS for each of the fiscal years 2011 to 2018 across all 11 industries. After observations with missing data are deleted, the final sample contains 121 firms representing 847 firm-years for the investigation of the year and industry effect and 578 firms corresponding to 4,046 firm-years for the analysis of the 27 financial factors determining P/E ratios. Look at Table 2 for the industries and their codes.

Table 2: **Industry Classifications Label**

Industry Classifications	Industry Abbreviation	Label Number
Communication Services	CMS	1
Consumer Discretionary	CD	2
Consumer Staples	CNS	3
Energy	E	4
Financials	F	5
Health Care	HC	6
Industrials	I	7
Information Technology	IT	8
Materials	M	9
Real Estate	RE	10
Utilities	U	11

The data from S & P Capital IQ is downloaded onto an Excel file and then uploaded into SPSS (Statistical Package for the Social Sciences). A multiple linear regression, using pooled cross-sectional data, consistent with the model specification of Jordan, Clark & Donald (2009) and Bhayo, Khan, & Shaikh (2011) among others is conducted on the following equation 1:

$$Forward\ P/E = b_0 + b_1 NPM + b_2 Del(NPM) + b_3 ROA + b_4 Del(ROA) + b_5 ROE + b_6 Del(ROE) + b_7 ROI + b_8 Del(ROI) + b_9 TAT + b_{10} Del(TAT) + b_{11} CR + b_{12} Del(CR) + b_{13} QR + b_{14} Del(QR) + b_{15} D/E + b_{16} Del(D/E) + b_{17} \ln(TA) + b_{18} Del\big(ln(TA)\big) + b_{19} EPS + b_{20} Del(EPS) + b_{21} DPR + b_{22} Del(DPR) + b_{23} DPS + b_{24} Del(DPS) + b_{25} DY + b_{26} Del(DY) + b_{27} Del(NI) + \varepsilon, \quad (1)$$

where b_i are the slope coefficients associated with each independent variable, b_0 is the intercept estimate, and ε is the error term. In equation 1 the dependent variable is the forward price-to-earnings ratio and the independent variables are those described in Table 1. See Appendix A for the definition of each of the independent variables.

After the initial simple regression runs identify which independent variables are significant, we combine these factors to regress simultaneously in the final multiple regression model on the dependent variable. Further, we proceed to operate the SPSS predefined forced, forward, and backward model selection methods of multiple regressions as robustness tests. More so, we estimate the multiple linear regression model with 2 additional variants of the dependent variable. That is, the forward P/E ratio is measured as of: 1. March 31st, 2. February 28th, and 3. January 31st.

FINDINGS AND PRESENTATION

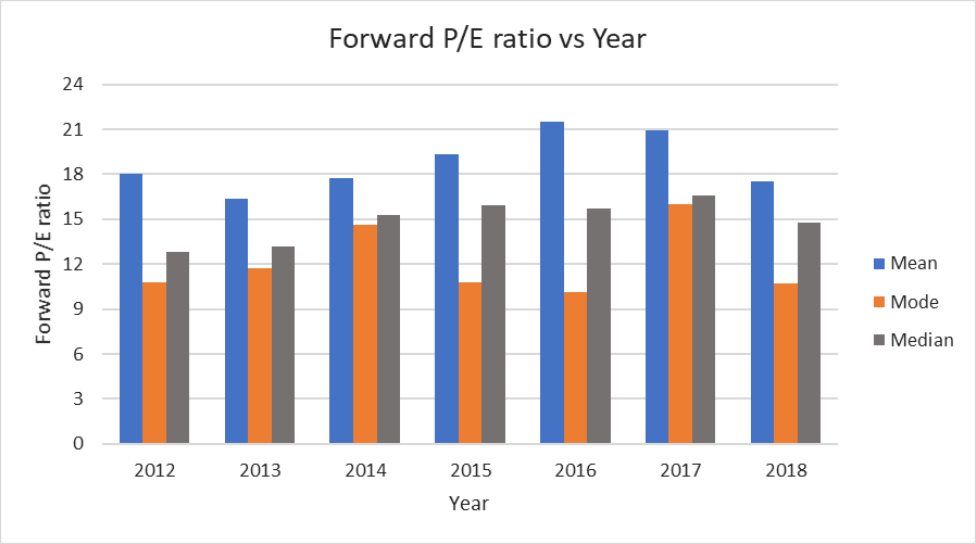
Sample statistics are displayed in Table 3. As a reference point the average P/E ratio is 18.770 with a tight confidence interval from 17.604 to 19.936 at an alpha level of 5%.

Table 3: Sample Statistics 2012 - 2018

Forward P/E (as of March 31 YYYY)		**Statistic**	**Std Error**
N	Valid	847	
	Missing	0	
Mean		18.770	0.5939
5% Trimmed Mean		16.245	
Mode		10.8	
Percentiles	25	11.100	
	50	14.900	
	75	20.100	
Variance		298.791	
Std. Deviation		17.2856	
Minimum		2.3	
Maximum		223.5	
Range		221.2	
Interquartile Range		9.0	
Skewness		5.613	0.084
Kurtosis		44.412	0.168
95% Confidence Interval for Mean	Lower Bound	17.604	
	Upper Bound	19.936	

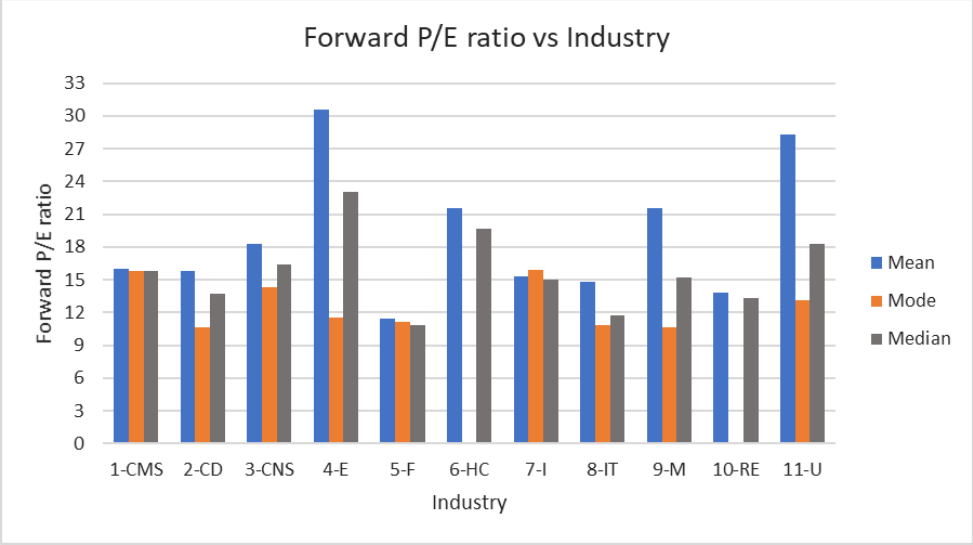
P/E ratios vary by year as displayed in Figure 1. The year 2013 experienced the lowest mean P/E ratio whereas 2016 had the highest mean P/E ratio. Utilizing the mode and the median statistics leads to other years being at the lowest or highest points.

Figure 1: Central Tendency of P/E ratios (by Years)



Figures 2 shows the forward P/E ratio by industry. Financials (industry 5) has the lowest average P/E ratio regardless of mean, mode, or median metrics versus energy (industry 4) and utilities (industry 11) at the highest levels dependent on which central tendency metric chosen. Some industries have few firms whereby these statistics may lead to inconclusive results.

Figure 2: Central Tendency of P/E ratios (by Industries)



The regression results of identifying the significant independent variables explaining the variation in the P/E ratios of Canadian firms, in the aggregate sample across all 11 industries, produced 3 models based on the dependent variable forward P/E as of date. Model 1, with the as of March 31st date, generated the equation:

$$P/E_{03,(YYYY+1)} = \\ = 24.622 - 0.182NPM_{(YYYY)} - 0.392ROI_{(YYYY)} - 3.679TAT_{(YYYY)} \\ + 0.343\big(ln(TA)\big)_{(YYYY)}$$

Two measures of profitability, the net profit margin and return on investment, are negatively related to the forward P/E ratio. This appears paradoxical to the thought that highly profitable firms should be rewarded with a high forward P/E ratio. The explanation may be that as the profitability decreases the market views this circumstance as temporary, perhaps contributed to a one-shot loss such as an adverse lawsuit outcome. Profits are expected to rebound in the future. Another reason is that declining net profit margin and return on investment will make the denominator in the P/E ratio lower. If the price increases, or is stable, or does not decline as much as the drop in E then the P/E ratio will increase. Likewise, there is an inverse relation between total asset turnover and the forward P/E ratio. Again, this seems contrary to expectations where a high total asset turnover is synonymous with being more efficient and the firm should enjoy a boost to the stock price causing the P/E ratio to go up. However, the underlying cause of the magnification of the total asset turnover may be from either a jump in sales or a reduction in the total asset base. Higher sales may have come about from charging lower prices, and/or from incurring greater expenses such as on marketing. A shrinkage in the asset base of the company may indicate too small of an investment in assets which may prematurely wear out (if they are depreciable assets) or at the least support the notion of an underinvestment in assets to support sales, the employees, and their productivity, et cetera. The fourth financial factor in Model 1 is the natural logarithm of total assets. Given the positive coefficient the bigger the firm the greater the P/E ratio and vice versa; size matters. See Table 4 for the regression output.

Table 4: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		β	Std. Error	Beta	t	Sig.	Tolerance	VIF
1[a]	(Constant)	24.622	5.761		4.273	.000		
	NPM	-.182	.066	-.127	-2.779	.006	.784	1.276
	ROI	-.392	.173	-.109	-2.269	.024	.708	1.413
	TAT	-3.679	1.387	-.125	-2.653	.008	.742	1.348
	ln(TA)	.343	.601	.027	.571	.568	.712	1.404
2[b]	(Constant)	31.324	6.249		5.013	.000		
	NPM	-.390	.071	-.245	-5.490	.000	.784	1.276
	ROI	-.392	.187	-.098	-2.094	.037	.708	1.413
	TAT	-5.207	1.504	-.159	-3.462	.001	.742	1.348
	ln(TA)	-.174	.652	-.012	-.266	.790	.712	1.404
3[c]	(Constant)	24.522	4.112		5.963	.000		
	NPM	-.233	.047	-.218	-4.989	.000	.781	1.280
	ROI	-.360	.123	-.135	-2.927	.004	.707	1.413
	TAT	-4.113	.987	-.187	-4.169	.000	.742	1.348
	ln(TA)	.166	.435	.018	.381	.703	.687	1.456
	DPS	.915	.397	.092	2.306	.021	.951	1.051

a. Dependent Variable: Forward P/E as of March 31
b. Dependent Variable: Forward P/E as of February 28
c. Dependent Variable: Forward P/E as of January 31

Model 2, with the as of date February 28th for the forward P/E dependent variable, has qualitatively similar results as Model 1 except the sign of the size variable (natural logarithm of total assets) has switched from positive to negative. Regardless, the t-statistic of the ln(TA) is insignificant (as a stand-alone variable) in each of models 1 and 2. What the size variable does do is contribute to a higher adjusted R-squared of 0.103 in model 2 as opposed to model 1 having 0.057; see Table 5.

Table 5: Model Explanatory Power

Model	R	R square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.252[a]	.063	.057	19.714	1.965
2	.330[b]	.109	.103	21.381	1.953
3	.378[c]	.143	.136	14.030	1.898

a. Predictors: (Constant), ln(TA), NPM, TAT, ROI
Dependent Variable: Forward P/E ratio as of March 31
b. Predictors: (Constant), ln(TA), NPM, TAT, ROI
Dependent Variable: Forward P/E ratio as of February 28
c. Predictors: (Constant), ln(TA), NPM, TAT, ROI, DPS
Dependent Variable: Forward P/E ratio as of January 31

Model 3, with the as of date January 31st for the forward P/E dependent variable, is the better model in terms of explanatory power with an adjusted R-squared of 0.136. The same 4 financial factors contained in each of models 1 and 2 are in model 3 along with an additional variable of dividends per share (DPS). The sign of the coefficient for NPM, ROI, and TAT remain negative but of course with different coefficient values. The ln(TA) is in the model, albeit with an insignificant t-statistic. The extra component is the DPS with a significant positive beta coefficient. Shareholders earn a total return from the corporation through the dividend and the capital gain (stock price appreciation). The higher the DPS the higher the P/E ratio, the lower the DPS the lower the P/E ratio. This is contrast to the residual theory of dividends and the internal growth rate tradeoff relationship between dividends and capital gains. As dividends are typically taxed at a higher rate than capital gains, especially when one considers the timing option of capital gains, the positive sign is the opposite of a priori expectations. Nevertheless, this is the empirical evidence of the study. The correlation matrix of the variables in Model 3 are shown in Table 6.

Table 6: Pearson Correlations

	Forward P/E as of March 31	NPM	ROI	TAT	ln(TA)
Forward P/E as of March 31	1.000				
NPM	-.159	1.000			
ROI	-.198	.414	1.000		
TAT	-.145	-.119	.212	1.000	
ln(TA)	.133	.070	-.354	-.468	1.000

	Forward P/E as of February 28	NPM	ROI	TAT	ln(TA)
Forward P/E as of February 28	1.000				
NPM	-.265	1.000			
ROI	-.229	.414	1.000		
TAT	-.144	-.119	.212	1.000	
ln(TA)	.114	.070	-.354	-.468	1.000

	Forward P/E as of January 31	NPM	ROI	TAT	ln(TA)	DPS
Forward P/E as of January 31	1.000					
NPM	-.248	1.000				
ROI	-.274	.414	1.000			
TAT	-.207	-.119	.212	1.000		
ln(TA)	.188	-.070	-.354	-.468	1.000	
DPS	.107	.055	-.034	-.101	.209	1.000

Viewing the Durbin-Watson statistics in Table 5 there is no support of a serial correlation issue in any of the 3 models. The Pearson correlations in Table 6 show no serious multicollinearity.

Table 7 contains the ANOVA results that tests whether the model is significantly better at predicting the outcome than using the mean as a best guess. This table is again split into three sections: one for each model. The F-values are 9.708, 17.487, 19.105 for models 1, 2, and 3, respectively. At an $\alpha = 0.01$, the regressions are highly significant overall ($Sig. < 0.01$).

Table 7: ANOVA Summary

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15091.975	4	3772.994	9.708	.000[a]
	Residual	222688.727	573	388.637		
	Total	237780.702	577			
2	Regression	31977.767	4	7994.442	17.487	.000[b]
	Residual	261955.406	573	457.165		
	Total	293933.174	577			
3	Regression	18802.457	5	3760.491	19.105	.000[c]
	Residual	112590.328	572	196.836		
	Total	131392.785	577			

a. Dependent Variable: Forward P/E ratio as of March 31
Predictors: (Constant), ln(TA), NPM, TAT, ROI
b. Dependent Variable: Forward P/E ratio as of February 28
Predictors: (Constant), ln(TA), NPM, TAT, ROI
c. Dependent Variable: Forward P/E ratio as of January 31
Predictors: (Constant), ln(TA), NPM, TAT, ROI, DPS

The sensitivity of the results to the forward and backward model selection methods of the final cross-sectional multiple regressions, valid for all 3 regression models, include the independent variables ROI, TAT, NPM, and QR (quick ratio); with the size factor dropping out. Model 3 includes these 4 variables as well as another variable, the DPS. The beta coefficient for the QR is positive and insignificant; nonetheless, it improves the adjusted R-squared. As such, the quick ratio positive relationship to the P/E ratio is supported by the financial distress literature. Low liquidity is a contributing factor and predictor to bankruptcy. Firms with high liquidity are stronger financially and benefit with a higher P/E ratio.

In relation to the previous literature, our empirical findings have some commonality. The statistically significant relation of the size factor (total assets) is congruent with Anderson and Brook (2006) and Kumar and Warne (2009). The net profit margin result is consistent with Bhayo, Khan, and Shaikh (2011) and partially supported by the study of Idrus, Ali, Mariana, and Jusni (2015) using profitability. The total asset turnover variable determination partially concurs with Bhayo, Khan, and Shaikh (2011). A connection between our return on investment significant component to a related profitability measure of return on equity is backed by Itemgenova and Sikveland (2020). Lastly, the finding of the dividends per share factor, in some measure, corresponds to Nikbakht and Polat (1998), Sezgin (2010), and Iltas and Kayhan (2017) evidence of dividends influencing the price-to-earnings ratio.

The above results are for the aggregate sample across all 11 industries. When we examine each industry separately, segregate basis, other financial variables are included in the industry-specific model. The 9 financial factors that are never part of any industry-specific model are: Del(NPM), Del(ROA), ROE, Del(ROE), Del(CR), Del(QR), D/E, DPR, and Del(NI). See Table 8 for the significant industry financial factor models, on a segregate basis across the 7 years.

Table 8: Forward P/E ratio and significant predictors by industries

Industry	Forward P/E as of Mar 31, (YYYY+1)	Forward P/E as of Feb 28, (YYYY+1)	Forward P/E as of Jan 31, (YYYY+1)
CMS	ln(TA), DPS, DY, CR	DPS, DY, QR, ROA, Del(DPS)	ln(TA), DPS, DY, QR
CD	ln(TA), Del(ln(TA)), Del(DY), Del(DPR)	ln(TA), Del(ln(TA)), Del(DY), Del(DPR)	ln(TA), Del(DY), CR
CNS	Del(D/E), Del(DPS), ROI	Del(D/E), Del(DPS), Del(EPS), TAT	ROI, QR, Del(ln(TA)), ROA
E	ROI	ROI, DPS	ROI, DPS
I	DPS, QR, Del(DY), DY, Del(DPR), Del(TAT)	No variables were entered into the equation	DPS, DY, Del(TAT), EPS
M	ROI, QR, NPM	ROI, QR, NPM, Del(TAT)	ROI, QR, NPM, TAT
U	EPS, TAT, QR, Del(ROI)	EPS, TAT, Del(ROI), CR	QR, DY

CONCLUSIONS

We discover that NPM, ROI, TAT, QR, ln(TA), and DPS determine the variation in Canadian P/E ratios across 11 industries for the 2011 to 2018 IFRS period. However, DPS appears as a predictor only for the P/E ratio as of January 31; while the others are consistent predictors for all three models (for the Forward P/E ratio as of March 31, as of February 28, and as of January 31). All predictors, but the ln(TA) are significant at alpha level 0.05 in the final models. No other factors from the list of 27 financial variables considered are P/E ratio determinants in our Canadian sample.

These results are consistent with the finance literature. Nonetheless, an important difference to the previous literature is our finding of parsimonious models with all 3 models (each of the 3 forward P/E dependent variable variants) in our simultaneous-derived regressions having a common set of 4 financial factors and only model 3 having 1 additional factor.

Investors can utilize our findings to construct investment strategies based on P/E ratio predicted by our results. Further, management can focus their attention on the narrow set of relevant financial factors impacting the P/E ratio. By elevating the firm's P/E ratio their cost of capital is lowered and capital budget opportunities increased.

RECOMMENDATIONS

We recommend that managers of Canadian firms enact operating procedures to increase their stock's price-to-earnings ratio. To raise the P/E ratio management should concentrate on the financial factors: net profit margin, return on investment, total asset turnover, total assets and dividends. The focus of activities may vary depend on the industry. In particular, to some extent a liquidity measure (such as the current ratio or quick ratio) affects at least 1 of the 3 dates of the

forward P/E ratio in all but the energy industry. Shareholders, money managers, and other investors (in their fundamental analysis forecast of pro forma financial statements) need to target the 5 financial factors that determine the P/E ratio to develop stock trading rules generating greater investment returns.

We recommend for further research of financial factors affecting the P/E ratio to study different stock markets. In addition, we suggest other historical time periods as well as diverse accounting systems can be studied. Furthermore, we advocate exploring the impact of other factors such as the business cycle, term structure of interest rates, and stock market cycle to learn their effect on the price-to-earnings ratio.

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