

# A Causal Relationship Model of the Financial Performance Affecting the Return on Equity of Listed Companies on the Stock Exchange of Thailand during COVID-19 Pandemic

**Srisuda Chongsithiphol**

School of Business Administration, Siam University, Bangkok, Thailand  
srisuda@siam.edu

## ABSTRACT

This research aimed to explore a causal relationship model of the financial performance affecting return on equity of listed companies on the Stock Exchange of Thailand during COVID-19 pandemic. The financial performance was used as a measure of how well the company used its assets and generate revenues as well as its overall financial health over a given period. In this study, the measures of financial performance included financial ratios, i.e., liquidity ratios, activity ratios, profitability ratios, debt ratios. Path analysis was used to evaluate causal models by examining the relationships between a dependent variable (ROE) and independent variables (CR, QR, CSR, DE, EM, TIE, IT, RT, TAT, PM, EBIT, and ROA). The study sample consisted of 200 firms listed on the Stock Exchange of Thailand in the year 2020. The research results indicated that during the period of the Coronavirus (COVID-19) pandemic which was a major event in the history and impacted businesses and economy all over the world, a causal relationship of the financial performance and return on equity was as normal situation. Financial performance ratios EM, TAT, PM, EBIT, and ROA had positive and significant direct relationship with ROE. The causal relationship model had  $R^2$  equaled to 99%

## Keywords

Financial Performance, ROE, Causal Relationship, Listed Firms, Stock Exchange of Thailand, COVID-19

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## Introduction

Coronavirus disease 2019 (COVID-19) was first identified an outbreak of respiratory illness cases in Wuhan City, Hubei Province, China. It was initially reported to the World Health Organization (WHO) on December 31, 2019. On January 30, 2020, the WHO declared the COVID-19 outbreak a global health emergency. On March 11, 2020, the WHO declared COVID-19 a global pandemic [1]. The economic activity was slowing as the practice social distancing to stem the spread of COVID-19. As a result, companies experienced and anticipated significant constraints on cash, working capital as well as potential liquidity shortage. Depending on the industry, the COVID-19 pandemic hurt business revenues and profits. There were uncertainties as new normal trend in the post-COVID 19 era identified by Deloitte [2] including unpredictability in financing sources, uses, and capital market; permanency of customer behavior changes. In Thailand, Krungsri Research revealed out of 473,324 companies, 143,414 companies (30.3%) experiencing tight liquidity. Another 132,980 companies (28.1%) going to be at risk of facing liquidity shortage. Only 154,318 companies (32.6%) being financial healthy [3]. In November, 2020, the Stock Exchange of Thailand (SET) announced that listed companies in the SET reported increases in their total sales and net profits in Q3/2020 from previous quarter after COVID-19 control measures had been relaxed. However, their first nine-month results reported a downturn posed by earlier pressure of the COVID-19 spread. In addition, Among 739 listed firms' Q3 financial reports ended September 30, 2020 (excluding NC – noncompliance, NPG – non-performing groups, property funds, and infrastructure

funds) 485 firms (69.3%) recorded net profit, aggregate sales of THB 2.50 trillion (approx. USD 80.8 billion), gross profit margin of 23.5 percent and net profit margin of 5.5 percent. Overall financial performance of the listed firms was better over the last quarter of the year 2020 in line with Thailand's economic growth [4].

The financial performance of a company is an economic and financial state which the investors use to make judgements about business by reading financial statements. The ratio analysis technique is virtually universal for analyzing the financial information. The firm shareholders value depends on good investment decisions. The financial manager evaluates investment decisions based on the profitability of the investment as well as the availability of financing. Assessment of financial performance is critical to any firm. Information obtained from financial ratio analysis is important to insiders and outsiders of the company. Ratio analysis has been utilized as a standard tool for analyzing financial statements. There have been studies on relationship among financial ratios such as recently Arina, et.al. [5] found that liquidity was influential but not significant to financial distress. The activity had significant effect on financial distress. Profitability had significant effect on financial distress. Leverage was influential but not significant to the financial distress. On the other hand, Kartika's work [6] showed that asset utilization and leverage were factors affecting financial performance (ROA and ROE) of firms listed on SSE 50. Assets Utilization had positive and significant relationship with firm performance but leverage had negative and significant relationship with firm performance. It was interesting to learn if the relationship between financial ratios and firm performance (ROE) would be the same or different during the period of COVID-19 pandemic. Therefore, this study aimed to

explore the causal relationship model of financial performance ratios and ROE of the firms listed on the Stock Exchange of Thailand in order to see if there were any abnormalities of relationship among financial ratios performance during the year 2020, new normal era.

## Research Objective

The research aimed to explore the impacts of financial ratios had on ROE by studying a causal relationship among financial ratios in 4 groups namely short-term solvency or liquidity ratios, long-term solvency or financial leverage ratios, asset utilization ratios, and profitability ratios, of companies listed on SET during the period of COVID-19 pandemic (year2020).

## Research Methodology

### Research Design

This research was an empirical study which mainly based on secondary data. The data was collected from the financial statements of firms listed on Stock Exchange of Thailand [7] during the study period, year 2020. According to a well known researcher named Kline [8], an adequate sample size should always be 10 times the amount of the variables in path analysis. The best sample size should be 20 times the number of variables in path analysis. There were 13 variables in this research therefore the sample size should be 130 – 260. Sample size used in this study was 200 that was adequate.

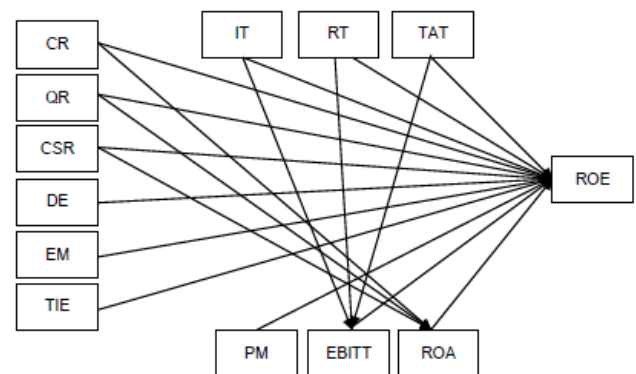
### Statistics Used in this Study

In statistics, Path Analysis was used to described the directed dependencies of variables including financial ratios that had direct effects on Return on Equity (ROE). Maximum likelihood was used to predict the path. Related equations were solved simultaneously to determine parameter estimates. To evaluate model fit, multiple tests including chi-square ( $\chi^2$ ), Comparative Fit Index (CFI), Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR).

### Research Conceptual Framework

Existing literature has proved that financial ratios have played a primal role in understanding a firm's characteristics [9]. They have the ability to explain various dimensions of a firm from profitability to long-term solvency. Short-term solvency ratios provide information about the company's liquidity which is ability to pay bills over a short run. Liquidity ratios include Current Ratio (CR), Quick Ratio (QR), and Cash Ratio (CSR) [10]. Long-term solvency ratios address the firm's long-term ability to meet its obligations. The measures include Total Debt ratio (DE), Equity Multiplier (EM), and Time Interest Earned (TIE). Asset management or turnover measures describe efficiency of a firm's assets utilization. Inventory Turnover (IT),

Receivables Turnover (RT), and Total Asset Turnover (TAT) are ratios assets utilization ratios. Profitability ratios are Profit Margins (PM), EBIT Margin, and Return on Assets (ROA). In this study used Return on Equity as an dependent variable. Financial ratios enable management to analyze the inter-linkage that exists between dimensions of the firms. Researchers have attempted to identify the relationship that exists between a company's dimension such as capital structure, working capital, leverage, and profitability [8]. In order to study the causal relationship of the financial performance affecting return on equity, the conceptual framework (see Figure 1) was developed as follows:



**Figure 1** A causal relationship between variables according to hypotheses

### Research Hypotheses

The research hypotheses are as follows:

- H1 : Current ratio (CR) had direct impact on Return on Equity (ROE).
- H2 : Quick ratio (QR) had direct impact on Return on Equity ROE.
- H3 : Cash ratio (CSR) had direct impact on Return on Equity (ROE).
- H4 : Deb-Equity ratio (DE) had direct impact on Return on Equity (ROE).
- H5 : Equity Multiplier (EM) had direct impact on Return on Equity (ROE).
- H6 : Times Interest Earned (TIE) had direct impact on Return on Equity (ROE).
- H7 : Inventory Turnover (IT) had direct impact on Return on Equity (ROE).
- H8 : Receivables Turnover (RT) had direct impact on Return on Equity (ROE).
- H9 : Total Assets Turnover (TAT) had direct impact on Return on Equity (ROE).
- H10 : Profit Margin (PM) has direct impact on Return on Equity (ROE).
- H11 : Operating Income Margin (EBIT) had direct impact on Return on Equity (ROE).
- H12 : Return on Assets (ROA) had direct impact on Return on Equity (ROE).
- H13 : Current ratio (CR) had direct impact on Return on Assets (ROA).
- H14 : Quick ratio (QR) had direct impact on Return on Assets (ROA).

H15 : Cash ratio (CSR) had direct impact on Return on Assets (ROA).

H16 : Inventory Turnover (IT) had direct impact on Return on Operating Income Margin. (EBIT).

H17 : Receivables Turnover (RT) had direct impact on Return on Operating Income Margin. (EBIT).

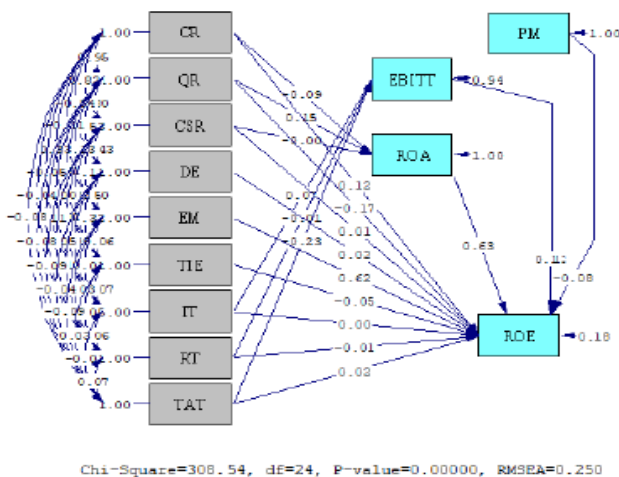
H18 : Total Assets Turnover (TAT) had direct impact on Return on Operating Income Margin. (EBIT).

## Research Results

After analyzing by setting the model shown in Figure 1 whether the model fitted the empirical financial data collected from SET website [10], it was found that Chi-square = 308.54, probability (p-value) = 0.00, Relative *Chi-square* = 12.86, Comparative Fit Index : CFI = 0.32, Goodness of Fit Index : AGFI = 0.27, Root Mean Square Error of Approximation : RMSEA = 0.25, Standardized RMR : SRMR = 0.14, (see Table 1 and Figure 2).

**Table 1** Fit Indices for Model and the Empirical Data (before model modification)

Fit Index	Acceptable Range	Calculated Rate	Explanation
$\chi^2$	Statistically insignificant at $> 0.05$	308.54	-
df	-	24	-
p-value	$p > 0.05$	0.00	Not supported
$\chi^2 / df$	$\chi^2 / df < 2$	12.86	Not supported
CFI	$\geq 0.90$	0.32	Not supported
GFI	$\geq 0.90$	0.81	Not supported
AGFI	$\geq 0.90$	0.27	Not supported
RMSEA	$< 0.05$	0.25	Not supported
SRMR	$< 0.05$	0.14	Not supported



**Figure 2** A causal relationship between variables (before model modification)

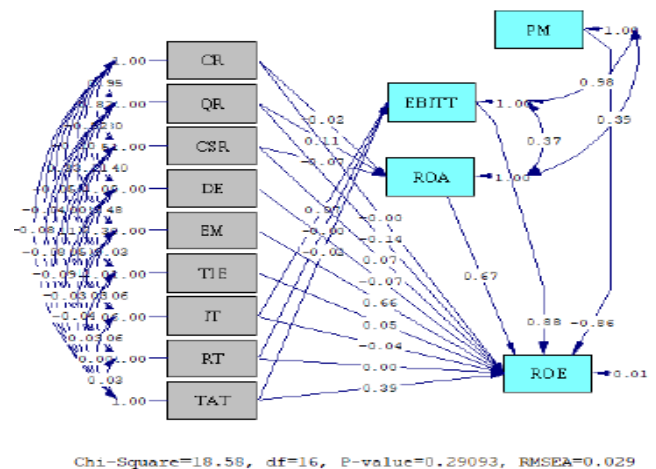
The fit of the model being evaluated was considered in adequate, therefore, the model was modified. The modification indices (MI) that were associated with the parameters of the model were used as diagnostic statistics to capture model mis-specification [11]. The MI indicated the fixed parameters should be freed to improve model fit.

Finally, model fitted data well after modification. Chi-square = 18.58, probability (p-value) = 0.29, Relative *Chi-square* = 1.16, Comparative Fit Index (CFI) = 1.00, Goodness of Fit Index (GFI) = 0.99, Adjusted Goodness of Fit Index (AGFI) = 0.92, Root Mean Square Error of Approximation (RMSEA) = 0.03, and Standardized RMR (SRMR) = 0.04. The structural equation model fitted the sample data well (see Table 2 and Figure 6).

**Table 2** Fit indices for model and the empirical Data (after model modification)

Fit Index	Acceptable Range	Calculated Rate	Explanation
$\chi^2$	Statistically insignificant at $> 0.05$	18.58	-
df	-	16	-
p-value	$p > 0.05$	0.29	Supported
$\chi^2 / df$	$\chi^2 / df < 2$	1.16	Supported
CFI	$\geq 0.90$	1.00	Supported
GFI	$\geq 0.90$	0.99	Supported
AGFI	$\geq 0.90$	0.92	Supported
RMSEA	$< 0.05$	0.03	Supported
SRMR	$< 0.05$	0.04	Supported

Figure 3 and Table 3 showed causal relationship between intent variables, namely, current ratio (CR), quick ratio (QR), cash ratio (CSR), deb-equity ratio (DE), equity multiplier (EQ), times interest earned ratio (TIE), inventory turnover ratio (IT), receivables turnover ratio (AR), total assets turnover (TAT), profit margin (PM), return on assets (ROA) and dependent variable return on equity (ROE).



**Figure 3** A causal relationship between variables (after model modification)

**Table 3** The results of direct effect, indirect effect, and total effect

Independent Variables	Dependent Variables								
	EBIT (R <sup>2</sup> = 0.00)			ROA (R <sup>2</sup> = 0.00)			ROE (R <sup>2</sup> = 0.99)		
	DE	IE	TE	DE	IE	TE	DE	IE	TE
CR	-	-	-	-0.02	-	-0.02	0.00	-0.01	-0.01
QR	-	-	-	0.11	-	0.11	-0.17	0.08	-0.06
CSR	-	-	-	-0.07	-	-0.07	0.07	-0.05	0.02
DE	-	-	-	-	-	-	-0.07	-	-0.07
EM	-	-	-	-	-	-	0.66**	-	0.66**
TIE	-	-	-	-	-	-	0.05	-	0.05
IT	0.07**	-	0.07**	-	-	-	-0.04	0.06	0.02
RT	0.00	-	0.00	-	-	-	0.00	0.00	0.00
TAT	-0.02	-	-0.02	-	-	-	0.39**	-0.02	0.37**
PM	-	-	-	-	-	-	-0.86**	-	-0.86**
EBIT	-	-	-	-	-	-	0.88**	-	0.88**
ROA	-	-	-	-	-	-	0.67**	-	0.67**

\*\*p<0.01, \*p<0.05; TE = (Total Effect), IE = (Indirect Effect), DE= (Direct Effect)

## Results of Hypothesis Testing

H1 : Current ratio (CR) had direct impact on Return on Equity (ROE). It was found that CR had statistically insignificant positive direct impact 0.00 on ROE, therefore, H1 was rejected.

H2 : Quick ratio (QR) had direct impact on Return on Equity ROE. It was found that QR had negative and statistically insignificant direct impact -0.17 on ROE, therefore, H2 was rejected.

H3 : Cash ratio (CSR) had direct impact on Return on Equity (ROE). It was found that CSR had positive and statistically insignificant direct impact 0.07 on ROE, therefore, H3 was rejected.

H4 : Deb-Equity ratio (DE) had direct impact on Return on Equity (ROE). It was found that DE had negative and statistically insignificant direct impact -0.07 on ROE, therefore, H4 was rejected.

H5 : Equity Multiplier (EM) had direct impact on Return on Equity (ROE). It was found that EM had negative and statistically significant impact 0.66 on ROE, therefore, H5 was accepted.

H6 : Times Interest Earned (TIE) had direct impact on Return on Equity (ROE). It was found that TIE had statistically insignificant positive impact 0.05 on ROE, therefore, H6 was rejected.

H7 : Inventory Turnover (IT) had direct impact on Return on Equity (ROE). It was found that IT had negative and statistically significant direct impact -0.04 on ROE, therefore, H7 was accepted.

H8 : Receivables Turnover (RT) had direct impact on Return on Equity (ROE). It was found that RT had statistically insignificant positive direct impact 0.39 on ROE, therefore, H8 was rejected.

H9 : Total Assets Turnover (TAT) had direct impact on Return on Equity (ROE). It was found that TAT had positive and statistically significant direct impact 0.39 on ROE, therefore, H9 was accepted.

H10 : Profit Margin (PM) has direct impact on Return on Equity (ROE). It was found that PM had negative and statistically significant direct impact -0.86 on ROE, therefore, H10 was accepted.

H11 : Operating Income Margin (EBIT) had direct impact on Return on Equity (ROE). It was found that EBIT had positive and statistically significant direct impact 0.01 on ROE, therefore, H11 was accepted.

H12 : Return on Assets (ROA) had direct impact on Return on Equity (ROE). It was found that ROA had positive and

statistically significant direct impact 0.01 on ROE, therefore, H12 was accepted.

H13 : Current ratio (CR) had direct impact on Return on Assets (ROA). It was found that CR had negative and statistically insignificant direct impact 0.07 on ROA, therefore, H13 was rejected.

H14 : Quick ratio (QR) had direct impact on Return on Assets (ROA). It was found that QR had positive and statistically insignificant direct impact 0.01 on ROA, therefore, H14 was rejected.

H15 : Cash ratio (CSR) had direct impact on Return on Assets (ROA). It was found that CSR had positive and statistically insignificant direct impact 0.01 on ROA, therefore, H15 was rejected.

H16 : Inventory Turnover (IT) had direct impact on Return on Operating Income Margin. (EBIT). It was found that IT had positive and statistically significant direct impact 0.01 on EBIT, therefore, H16 was accepted.

H17 : Receivables Turnover (RT) had direct impact on Return on Operating Income Margin. (EBIT). It was found that RT had positive and statistically insignificant direct impact 0.01 on EBIT, therefore, H17 was rejected.

H18 : Total Assets Turnover (TAT) had direct impact on Return on Operating Income Margin. (EBIT). It was found that TAT had negative and statistically insignificant direct impact -0.02 on EBIT, therefore, H13 was rejected.

## Discussion

The results of H1 to HH18 testing indicated that financial ratios as independent variables which had statistically significant direct impacts on ROE were EM, TAT, PM, EBIT, and ROA with direct effect of 0.66, 0.39, -0.86, 0.88 and 0.67 respectively, at confidence interval of 0.01. Meanwhile financial ratios as independent variables which had statistically insignificant direct impacts on ROE were CR, QR, ASR, De, TIR, IT and RT with direct effect of 0.00, -0.17, 0.07, -0.07, 0.05, 0.04, and 0.00 respectively, at confidence interval of 0.01.

In terms of financial ratios as independent variables which had indirect effects on return on equity (ROE) passing through return on assets (ROA) were CR, QR, CSR which had impact power of -0.01, 0.08, and -0.05 respectively, statistically insignificant at confidence interval of 0.01. In addition, it was found that financial ratios as independent variables which had indirect effects on return on equity (ROE) passing through operating income margin (EBTT) were IT, RT, TAT which had impact power of 0.06, 0.00 and -0.02 respectively, statistically insignificant at confidence interval of 0.01.

On the other hand, the study showed that there were financial ratios as independent variables had statistically insignificant indirect impact on ROE through variable ROA. Those variables were CR, QR, CSR whose effects were -0.01, 0.08, and -0.05 respectively. Moreover, there were financial ratios as independent variables had statistically insignificant indirect impact on ROE through variable EBIT. Those variables were IT, RT, TAT whose effects were 0.06, 0.00 and -0.02 respectively.

The financial ratios as independent variables had statistically insignificant direct impact on EBIT were IT, RT, TAT with effects of 0.04, 0.00, and -0.02 respectively.

Variables CR, QR and CSR had statistically insignificant impact on ROA with effect of -0.02, 0.11, and -0.07 respectively. Last but not least, this structural causal relationship model had  $R^2 = 99\%$

These findings were partially consistent with previous studies such as Miswanto and Oematan [12] demonstrated that working capital turnover as well as receivable turnover, inventory turnover and asset turnover had positive impact but the cycle of cash conversion had negative impact on performance of financial management. Xu, M., and W. Banchuenvijit [13] also supported this finding in their study saying that current ratio had a positive but insignificant impact on both ROA and ROE, liquidity positively but insignificantly affected firms' financial performance. Total assets turnover ratio had a positive and significant impact on both ROA and ROE so assets utilization positively and affected firms' financial performance. Debt ratio had a negative and significant impact on both ROA and ROE, so leverage negatively and significantly affected firms' financial performance.

A closer look at ROE which was the dependent variable in this study, ROE allows investors to see how much money they are making on their investment into a company. In 1930, the DuPont Corporation aimed to find a platform that could provide a detailed assessment of any company's profitability. The model they developed was so-called DuPont analysis. It allows investors to pinpoint the strengths of a company and also provides early warning signs to any potential weaknesses [14]. DuPont analysis breaks down ROE into its core components and allows analyst to better assess potential ROE. The DuPont identity indicates that ROE is affected by 3 components which are operating efficiency as measured by profit margin (PM), asset use efficiency as measured by total asset turnover (TAT) and financial leverage as measured by the equity multiplier (EM). The findings of this research confirmed the DuPont identity (H10, H9, H5).

## Conclusion

Ratio analysis is a useful management tool that will improve understanding of financial results and provide key indicators of organizational performance. Managers will use ratio analysis to pinpoint strengths and weaknesses from which strategies and initiatives can be formed. Financial ratio analysis is aimed to assess the financial performance and determine the financial position of an organization through its profitability, liquidity, activity, leverage and other relevant indicators. There are many groups and individuals want to know about the business performance or position with their areas of interest. They are bankers and lenders using profitability, liquidity and investment because they want to know the ability of the borrowing business in regular scheduled interest payments and repayments of principal loan amount; investors using profitability and investment because they are more interested in profitability performance of business and safety and security of their investment and growth potential of their investment; government using profitability because government may use profit as a basis for taxation, grants and subsidies; employees using profitability, liquidity and activity because employees will be concerned with job security, bonus and

continuance of business and wage bargaining; customers using liquidity because customers will seek reassurance that the business can survive in the short term and continue to supply; suppliers using liquidity because suppliers are more interested in knowing the ability of the business to settle its short-term obligations as and when they are due; and management using all ratios because management is interested in all aspects i.e., both financial performance and financial condition of the business [10]. This study showed the findings that were consistent with previous research in terms of causal relationship between financial ratios and ROE even though the period of study was in the year of COVID-19 pandemic. A suggestion for further study is that as COVID-19 outbreak affected each business sector in different way, it is worthwhile to categorize the sample in groups according to their business activity sectors. The expected research outcomes should provide in-depth financial information for the financial analysts and investors for their investment and management decision making.

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