

**DISCOUNTED CASH FLOW VALUATION OF DIAMOND
BUILDING PRODUCTS PUBLIC COMPANY LIMITED**



**A THEMATIC PAPER SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF MANAGEMENT
COLLEGE OF MANAGEMENT
MAHIDOL UNIVERSITY
2020**

COPYRIGHT OF MAHIDOL UNIVERSITY

Thematic paper
entitled
**DISCOUNTED CASH FLOW VALUATION OF DIAMOND
BUILDING PRODUCTS PUBLIC COMPANY LIMITED**

was submitted to the College of Management, Mahidol University
for the degree of Master of Management
on
December 27, 2020



Pattapong R.
.....
Mr. Pattapong Rasri
Candidate

RK
.....
Prof. Roy Kouwenberg,
Ph.D.,CFA
Advisor

Simon Zaby
.....
Simon Zaby,
Ph.D.
Chairperson

DA
.....
Asst. Prof. Duangporn Arbhasil,
Ph.D.
Dean
College of Management
Mahidol University

Worapong Janyangyuen
.....
Worapong Janyangyuen,
D.B.A.
Committee member

ACKNOWLEDGEMENTS

I would like to express my gratitude and appreciation to my advisor, Dr. Roy Kouwenberg for his guidance, comments, and engagement through the process of this thematic paper. Besides my advisor, I would like to thank my committee members, Dr. Simon Zaby, and Dr. Worapong Janyangyuen for their insightful suggestions, and expertise knowledge sharing, especially the guideline to choose the company for thematic paper.

Special thanks to my friends, Mr. Suthipun Thanesuen, Mr. Rattanan Pharino, Miss Sasaporn Chansirikiat, Miss Chanappiya Choomjai, and Mr. Surachet Chansri for their precious knowledge sharing, shared their time during the course with the fantastic collaboration.

I would also like to express my warm thanks to program coordinators at the CMMU for facilitating me to complete this thematic paper. Lastly, a special thank you to my family and Miss Daungkamon Neamwan for offering support throughout the program of Master of Management to accomplish the success of this thematic paper.

Pattapong Rasri

DISCOUNTED CASH FLOW VALUATION OF DIAMOND BUILDING PRODUCTS PUBLIC COMPANY LIMITED

PATTAPONG RASRI 6249036

M.M. (FINANCIAL MANAGEMENT)

THEMATIC PAPER ADVISORY COMMITTEE: ROY KOUWENBERG, Ph.D.,
SIMON ZABY, Ph.D., WORAPONG JANYANGYUEN, Ph.D.

ABSTRACT

This thematic paper applied the principle of discounted cash flow valuation approach to evaluate the intrinsic value of Diamond Building Products Public Company Limited (DRT)'s share price.

Diamond Building Products Public Company Limited (DRT) is a roof tiles and construction material manufacturing and distributing company that is listed in the construction material sector in the stock exchange of Thailand (SET). The company's products are composed of 5 groups which are roofing products, boards and ceiling products, siding board products, roof accessory products, and non-roof products. DRT also provides the installation service for customers.

According to the DCF analysis, the sales revenue of the company increases by 4.67 % CAGR from 2020 to 2025 driven by GDP growth in the construction sector which is forecasted to increase by 4.72% CAGR in the same period. After the year 2025, I assume the sales growth of the company is 2.09% per annum (perpetual growth), which is a conservative rate considering the past five years' performance of the company. The target stock price of DRT is 7.51 baht per share as of 31 December 2020, with a 28% upside compared to the latest stock price as of 30 December 2020 which is 5.85 baht per share. The current stock price is undervalued based on our DCF valuation. As the difference is in the range of "10% or Greater upside", my recommendation for DRT is "BUY".

KEY WORDS: DRT/ Valuation/ Discounted Cash Flow/ Construction Materials

48 pages

CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
ABSTRACT	iii
LIST OF TABLES	v
LIST OF FIGURES	vi
LIST OF ABBREVIATIONS	vii
CHAPTER I INTRODUCTION	1
CHAPTER II BUSINESS DESCRIPTION	3
2.1 Business	3
2.2 Strategies	7
2.3 Management and Governance	8
CHAPTER II MACROECONOMIC, INDUSTRY ANALYSIS, COMPETITION ANALYSIS	9
3.1 Macroeconomic Analysis	9
3.2 Industry analysis	12
3.3 Competition analysis	13
CHAPTER IV VALUATION	16
4.1 Financial Analysis	16
4.2 Discounted Cash Flow Valuation	19
4.3 Valuation recommendation	28
CHAPTER V INVESTMENT RISKS AND DOWNSIDE POSSIBILITIES	31
CHAPTER VI CONCLUSIONS	34
6.1 Triggers for re-assessment	35
6.2 Limitations	35
APPENDICES	37
REFERENCES	46
BIOGRAPHY	48

LIST OF TABLES

Table	Page
2.1 Revenue Structure	5
2.2 Performance of DRT in 2020	7
3.1 Domestic Market Shares in 2018	13
4.1 Dupont Analysis of ROE	16
4.2 Growth Analysis of DRT, SCC and DCC	17
4.3 Growth Analysis for year 2019 and 2020	18
4.4 GDP Construction Sector	19
4.5 Pro forma statement	20
4.6 WACC Calculation	22
4.7 Discounted cash flow	23
4.8 The scale for the rating	24
4.9 Sensitivity Analysis	24
4.10 Major shareholders	26
4.11 Implied WACC	27
4.12 Implied WACC for new beta	27
4.13 Possible factors	28
4.14 Range of stock price	28
4.15 Expected return	29
4.16 Stock price	29
4.17 Price comparison	30
5.1 Risk Matrix	32
A-1 Regression Statistics	38
A-2 Year 2020 Estimation	39
B-1 Average total return and SD	41
B-2 Beta estimation using Data Analysis in Excel	42
C-1 Growth rate comparison	43
D-1 Beta estimation using Data Analysis in Excel	45

LIST OF FIGURES

Figure	Page
2.1 DRT History Timelines	3
2.2 DRT's Products	4
2.3 Revenue and Net Profit of DRT	5
2.4 Gross domestic product (GDP) from the construction sector in Thailand from 2010 to 2019	6
3.1 The world and Thailand's GDP	9
3.2 Relationship between Interest rate, Inflation rate and Exchange rate	11
3.3 Inflation rate	11
3.4 The five forces analysis for DRT	13
4.1 Spider chart	25
4.2 Football field for DRT	29
A-1 Domestic sales	37
A-2 GDP construction sector	38
A-3 Scatter plot	39
B-1 Total return index	40
B-2 Total return	41
B-3 Scatter plot	42
C-1 Sales revenue	43
D-1 Price index	44
D-2 Price Return	45

LIST OF ABBREVIATIONS

CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditure
CAPM	Capital Asset Pricing Model
CLMV	Cambodia, Laos, Myanmar, and Vietnam
COGS	Cost of Goods Sold
COTTO	Siam Cement Group Ceramics Public Company Limited
COVID-19	Coronavirus disease starting in 2019
DCC	Dynasty Ceramic Public Company Limited
DCF	Discounted Cash Flow
DRT	Diamond Building Products Public Company Limited
EBIT	Earnings Before Interest and Taxes
EBITDA	Earnings before interest, taxes, depreciation, and Amortization
EPS	Earnings per share
EV	Enterprise Value
FY	Fiscal year
GDP	Gross Domestic Product
IMF	International Monetary Fund
MLR	Minimum Loan Rate
PBV	Price to Book Ratio
PER	Price to Earnings Ratio
PV	Present Value
Rf	Risk free
ROA	Return on Assets
ROE	Return on Equity
SCC	Siam Cement Public Company Limited
SCCC	Siam City Cement Public Company Limited
SD	Standard deviation
SEC	Securities and Exchange Commission of Thailand
SET	Stock Exchange of Thailand
SG&A	Selling, General and Administrative Expense
THB	Thai Baht currency
TOA	TOA Paint (Thailand) Public company limited
WACC	Weighted Average Cost of Capital

CHAPTER I

INTRODUCTION

Diamond Building Products Public Company Limited (DRT) is the roof tiles and construction material manufacturing and distributing company which is categorized in the construction material sector in the stock exchange of Thailand (SET). The company's products are composed of 5 groups which are roofing products, board and ceiling products, siding board products, roof accessory products, and non-roof products. DRT also provides the installation service for customers.



DRT's main source of revenues is roofing products, at approximately 46-48% of sales. And services (installation) have the smallest share (8%). The portion between domestic and international revenue is approximately 80:20. DRT's strategies are (1) cost reduction strategy which makes DRT gain more profit even the industry's flat growth or during the COVID-19 pandemic and (2) high dividend payout strategy (dividend yield \approx 7% p.a.) which would attract the investors.

Recently, during the COVID-19 pandemic, DRT's revenue decreased by about 8.4% compared with the first 9 months of 2019, but its expense decreased more than that (-9.5%) so the net profit decreased only a little (-2.5%). However, due to stock repurchases, the earnings per share (EPS) increased by 2%.

According to the DCF analysis, the sales revenue of the company increases by 4.67% CAGR from 2020 to 2025 driven by GDP growth in the construction sector which increases by 4.72% CAGR in the same period. After the year 2025, I assume the sales growth of the company is 2.09% per annum (perpetual growth), which is a conservative rate considering the past five years' performance of the company.

The target stock price of DRT is 7.51 baht per share as of 31 December 2020, with 28% upside compared to the latest stock price as of 30 December 2020 which is 5.85 baht per share. The current stock price is undervalued based on our DCF valuation. As the difference is in the range of “10% or Greater upside”, my recommendation for DRT is “BUY”.



CHAPTER II

BUSINESS DESCRIPTION

2.1 Business

Diamond Building Products Public Company Limited (DRT) is a manufacturing and distributing company of roofing products, wall sidings, ceilings, and artificial boards under the brands of Diamond Roof, Adamas, and Jearanai. Besides the manufacturing and distribution of products, the company also provides design and installation services. The company has a long history since 1985 as Siam Tiles and Pipes Co., Ltd. Then, it was listed in the SEC in year 2005 and changed its name to “Diamond Building Products Co., Ltd.” in 2011 as shown in the history timeline in **Figure 2.1**.



Figure 2.1 DRT History Timelines

Source: <https://www.dbp.co.th/en/aboutus.php>

2.1.1 Products and Services

The company's products are composed of 5 groups (**Figure 2.2**).

- *Roofing products* are fiber cement roof tile and concrete roof tile.
- *Board and ceiling products* are diamond board, diamond block, diamond lintel and diamond counter for kitchen.
- *Siding board products* are lathes, eaves, fences and floor plank.
- *Roof accessory products* are heat insulators, foils, etc.
- *Non-roof products* are truss, beam, gypsum board, etc.

Besides the products, the installation services by expert teams are also provided to build the customers' confidence with the product. They are well-trained by the company. Therefore, the company provides one-stop service for the customers to change or install the new roof tiles and other products.



Figure 2.2 DRT's Products

2.1.2 Sources of Revenue and Growth

Roofing products are the main source of revenue of DRT which is approximately 46-48% (**Table 2.1**). And the service (installation) has the smallest share (8%). The ratios between domestic and international revenue are approximately 80:20. Nowadays it seems that roofing and construction material industry is in the mature stage as it could be seen from the revenue of DRT which has a linear growth (its CAGR (2015-2019) of revenue is 3.69%) in the past few years (**Figure 2.3**) as well as a flat growth of a gross domestic product (GDP) from the construction sector (**Figure 2.4**). However,

due to efficient management, the profit margin has increased from 9.87% in 2018 to 12.04% in 2019.

Table 2.1 Revenue Structure

Products and Services	2019		2018		2017 *	
	Million Baht	%	Million Baht	%	Million Baht	%
Revenues from sales and services						
1. Revenue from Product Sales	4,326.94	91.14%	3,948.85	91.21%	3,825.51	91.71%
1.1 Roofing Products	2,232.40	47.02%	2,018.02	46.61%	2,030.59	48.68%
1.2 Board and Ceiling Products	742.69	15.65%	747.51	17.27%	717.70	17.21%
1.3 Siding Board Products	838.52	17.66%	771.57	17.82%	729.96	17.50%
1.4 Special Products	513.33	10.81%	411.75	9.51%	347.26	8.32%
2. Revenue from Services	420.61	8.86%	380.50	8.79%	345.62	8.29%
Total Revenues from sales and services	4,747.55	100.00%	4,329.35	100.00%	4,171.13	100.00%

Source: DRT Annual Report 2019

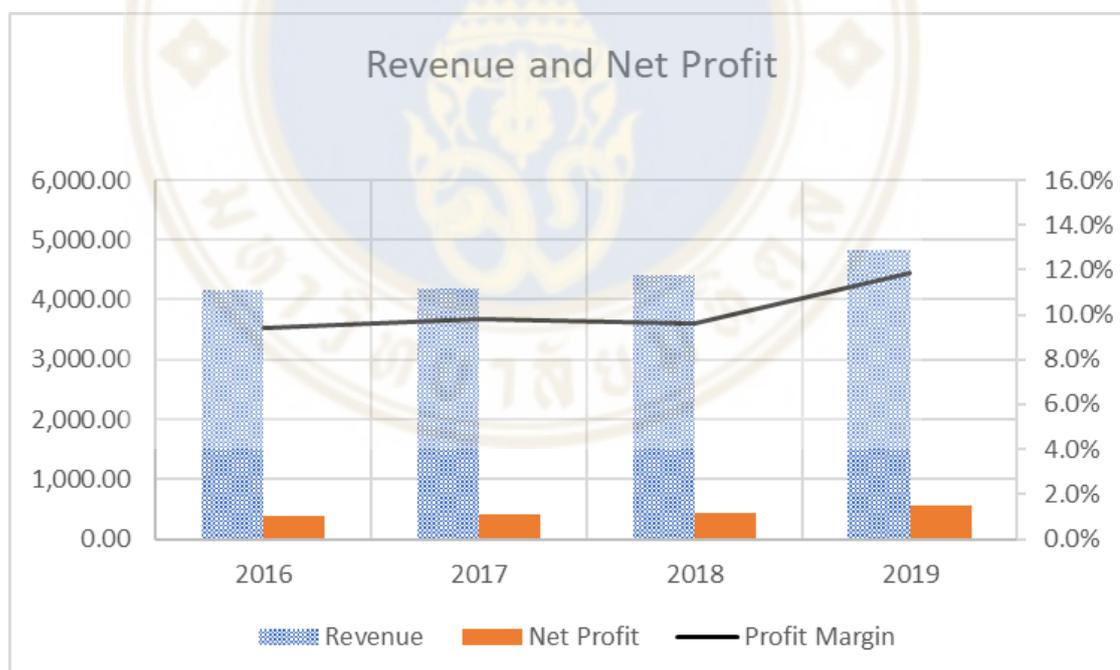


Figure 2.3 Revenue and Net Profit of DRT

Source: DRT Annual Report 2019



Figure 2.4 Gross domestic product (GDP) from the construction sector in Thailand from 2010 to 2019

Source: <https://www.statista.com/>

For roofing products, DRT holds the third rank in the market in Thailand. The first rank is held by Siam Cement Public Company Limited (SCC) and the second rank is Ha Huang tiles by Shera. As people may not change roof so often (it should be last long more than 10-20 years) and housing growth is slower than the condominium growth, the growth from the construction material sector depends on product diversification or the new products. The artificial wooden material is one of the product diversifications in which all 3 companies are manufacturing and seem to have higher growth as it is cheaper than the real wood.

From Management Discussion and Analysis Quarter 3 Ending 30 Sep 2020 (DRT Management, 2020), DRT has fewer sales this year compared with the previous year. One main reason is the COVID-19 pandemic in Thailand and neighborhood countries. Even though Thailand can control the spread of COVID-19, the economy is difficult to recover as Thailand's economy depends on the service sector which is contributed more than 50% of GDP (Plecher, 2020). Moreover, the second wave of COVID-19 has occurred in Myanmar, Laos and Cambodia which reduce export sales.

So, DRT has less net profit in quarter 3 of 2020 comparing with quarter 3 of 2019, i.e. decreasing by 14.45%. However, for 9-month period, net profit (excluding extraordinary items) increased by 1.18%.

Table 2.2 Performance of DRT in 2020

Description	Year 2020	Year 2019	Increase / (Decrease)	
	Million Baht	Million Baht	Million Baht	%
3rd Quarter (July – September)				
Net Profit (Including Extraordinary Items)	111.35	130.16	(18.81)	(14.45)
Extraordinary Items are as follows;				
(1) Less Gain on sale of unused land	-	-	-	-
(2) Plus Provision for employee retirement benefits from 300 to 400 days	-	-	-	-
Net Profit (Excluding Extraordinary Items)	111.35	130.16	(18.81)	(14.45)
9-Month Period (January – September)				
Net Profit (Including Extraordinary Items)	462.14	474.14	(12.00)	(2.53)
Extraordinary Items are as follows;				
(1) Less Gain on sale of unused land	10.18	46.31	(36.13)	(78.02)
(2) Plus Provision for employee retirement benefits from 300 to 400 days	-	18.87	(18.87)	(100.00)
Net Profit (Excluding Extraordinary Items)	451.96	446.70	5.26	1.18

Source: DRT (2020)

2.2 Strategies

DRT has set the goals for sales and marketing, production and engineering, human resources, and accounting and finance which has a monitoring system to ensure that each department is strict with the goals, strategies, and plans. The plans and strategies are medium-term and whole year (annually). Several projects have been done, for example, environmental and risk assessment for the whole value chain, introduction of the innovation and production technology to enhance competitiveness.

DRT's strategies and plan will lead to increase in its profit margin. From the annual report 2019 of DRT, the profit margin in 2017 was 9.87% but it was 12.04% in 2019. This would lead to higher earnings per share which were 0.43 baht per share and 0.60 baht per share in year 2017 and 2019, respectively. This would make DRT more attractive to the investors. Moreover, in 2019, DRT increases the dividend from

0.36 baht per share in year 2018 and 2017 to 0.40 baht per share in year 2019. For the value investors, they may entice them to keep this stock for long time as they can get more and more dividends, even while the construction industry is mature. Or it could be classified as the dividend stock.

2.3 Management and Governance

From DRT Annual report 2019 (DRT, 2020), Board of Directors is committed to being an efficient business organization, having competitiveness with good financial performance and responsibility, prudence, honesty, transparency, and a code of conduct in business. The company might take care of shareholders and all stakeholders equally and fairly. Also, the company might contribute to society and reduce the impact on the surrounding environment and might not violate human rights. Moreover, the company should be politically neutral and anti-corruption for "creating sustainable business value". Currently, DRT's CG score from SET is 5.

DRT

DIAMOND BUILDING PRODUCTS PUBLIC COMPANY LIMITED

Property & Construction/Construction Materials

sSET

CG Report: ▲▲▲▲▲

Data as of 23 Nov 2020

CHAPTER III

MACROECONOMIC, INDUSTRY ANALYSIS, COMPETITION ANALYSIS

3.1 Macroeconomic Analysis

3.1.1 The world and the country's GDP

Due to the pandemic (COVID-19), the world economy fell, especially Thailand economy that is expected to fall more than other countries. The International Monetary Fund (IMF) has forecasted Thailand's GDP growth forecast as -7.1% for 2020 while the World's GDP growth forecast is -4.4%. (Figure 3.1) Many countries were under a lockdown for preventing the COVID-19 spread, so the tourists cannot travel, which is one key factor of GDP. Thailand also lockdown which makes the income from overseas tourist to be zero.



Figure 3.1 The world and Thailand's GDP

Source: IMF

As a result, many businesses have been shut down temporarily or permanently, and private sector companies delay their investment. For the government,

its budget has been changed to COVID-19 curing budget so many projects have been postponed or even canceled. Many people are unemployed due to closing businesses. Economy gets worse for all countries. Many monetary policies were issued, e.g. lower the interest rate, postpone the loan payment, etc., which may be successful in short term but not in long term. What can cure the economic crisis is a COVID-19 vaccine which they are now testing and maybe launching soon. Therefore, the world and Thailand's GDP are predicted to be positive by next year.

Obviously, the growth in the construction material sector is expected to be negative this year due to the pandemic. People delay their purchasing for renovation, construction of houses, and when buying the new condominium or house.

3.1.2 Interest rate, Inflation rate and Exchange rate

Interest rates are important to the economy as it involves with people's spending, saving, and investing. Low-interest rate makes people have more cash in hand for spending. Then, the economy is expanded, and people will have more income. These will affect the inflation later. After inflation occurs, the government has to raise future interest rates to control inflation. The consequence of the increasing interest rate is the inflow of money from overseas which will make the Thai baht appreciate, which will affect the exports. Then, the central bank may have to manage the Thai baht somehow. It seems that it is a kind of cycle for interest rate, inflation rate and exchange rate which is quite hard work for Bank of Thailand and government. Some theories can explain the phenomenon, i.e. fisher effect, international fisher effect and interest rate parity. (**Figure 3.2**)

From **Figure 3.3**, it shows that year 2020 Thailand has a negative inflation rate or deflation. From **Figure 3.1** and **Figure 3.3**, it can be concluded that Thailand's economy is in the crisis period which may be worse than other countries nearby as Thailand's economy depends more heavily on tourism.

From Management Discussion and Analysis Quarter 3 Ending 30 Sep 2020 (DRT Management, 2020), COVID-19 is the world's economic crisis. DRT and other construction material companies are also facing this effect which decreases their sales. For the first 9 months in 2020, DRT's sales decreased by 2.53% but its net profit surprisingly increased by 1.18% compared with the first 9 months in 2019. It is because

DRT management reduced its administrative expenses by 3.11% comparing with year 2019. For the financial ratio, both ROE and ROA in 2020 are 3.63% and 0.63% more than those in year 2019, respectively. It seems that DRT goes in the good direction even facing the world’s economic crisis.

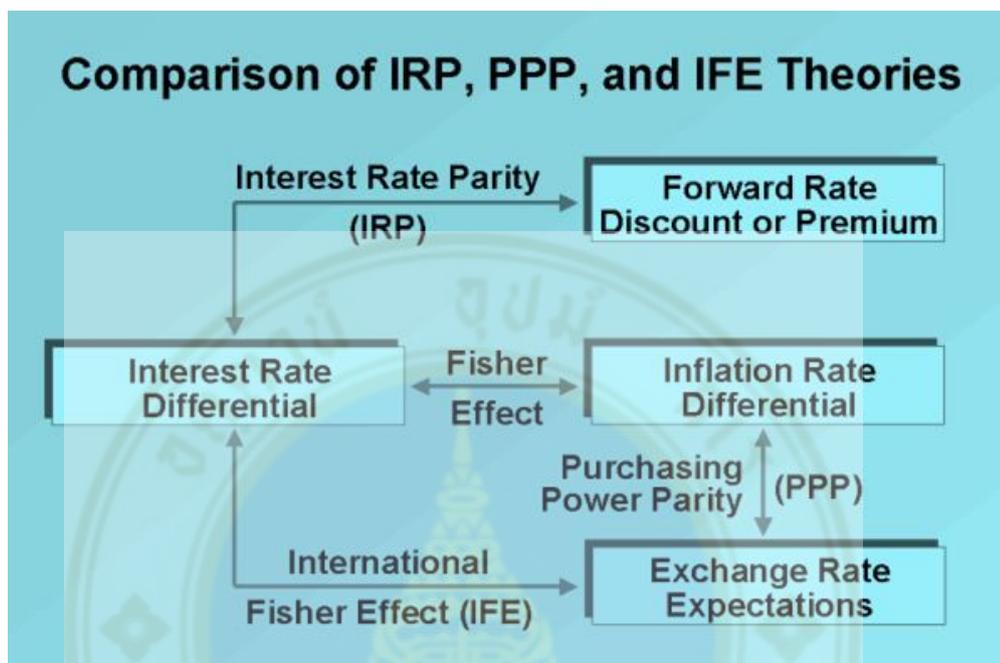


Figure 3.2 Relationship between Interest rate, Inflation rate and Exchange rate

Source: <https://www.swlearning.com/finance/madura/ifm7e/powerpoint/expanded08/sld001.htm>

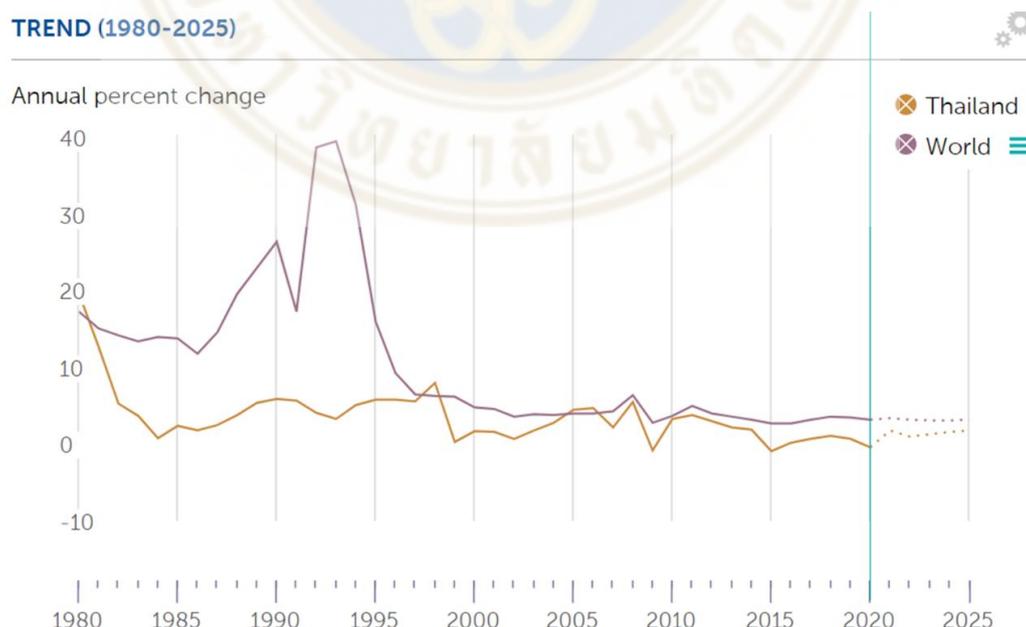


Figure 3.3 Inflation rate

Source: IMF

3.2 Industry analysis

As mentioned earlier, the construction material industry is in the mature stage. Krungsri industry outlook 2020-22 also analyzed that the construction material industry is expected to decrease this year due to the COVID-19 impact and slow progress of construction projects. The growth is expected to be 1-2% this year (*Krungsri Industry Outlook, June 2020*). Some reasons have been given for this, which are

- Lower spending power from domestics and oversea market due to downtrend of the economy
- New loan restriction for second home mortgage (at least 10% of down payment)
- Over-supply in the residential property market.

Nevertheless, the demand for construction material would rebound in the next year as construction will be raised again, especially from the public construction projects, e.g. mass rapid transit projects in Bangkok and its vicinities. For private sector, the demand is expected to be grown by 0-1% in 2021 and 1-2% in 2022 which is lower than the growth from the government sector. For DRT, as its main product is roof tiles and some building material that focus on the housing project, so the forecast of DRT would be focused only on private sector.

For the distribution, most of this industry uses the dealers and modern trade as the distribution channel, e.g. HomePro, Thai Watsadu, Global, Dohome, etc. So, the growth of the modern trade is the growth of this industry. Some companies are using their channel, e.g. Cement Thai Home mart and SCG home by Siam Cement group, etc. The other distribution channel is direct contract to property developer.

Focusing on domestic market share in 2018, DRT was in the third rank and has the market share about 17.15%. (**Table 3.1**) The difference between the second (Mahaphant group) and third rank is approximately 5% (1,700 million baht), which is quite hard to make up. However, more product diversification would be the solution that may take time to develop the product.

There is the good point in this industry that they do not compete on the price with each other, so it will maintain a good profit margin for the industry.

Table 3.1 Domestic Market Shares in 2018

Manufacturers (Unit: Million Baht)	Sales in 2018	
	Amount	Market Share
1. Siam Cement Group	12,037.33	46.91%
2. Mahaphant Group	6,152.84	23.98%
3. Diamond Building Products	4,401.35	17.15%
4. Kitenit Group (Olanvanich)	844.30	3.29%
5. Conwood	1,065.45	4.15%
6. Thai Ceramic Roofing Tiles Co., Ltd.	1,159.59	4.52%
Total	25,660.86	100.00%

Source: Department of Business Development, Ministry of Commerce

3.3 Competition analysis

Five forces analysis is applied for competition analysis of DRT. **(Figure 3.4)**

Five parts will be analyzed here.

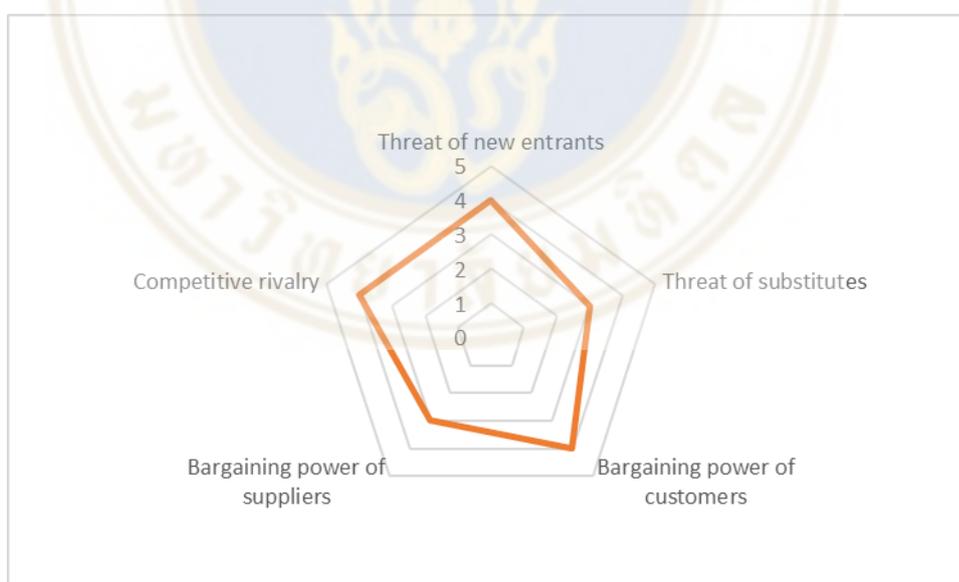


Figure 3.4 The five forces analysis for DRT

High threat of new entrants, there are not many companies in this business (roofing products, boards and ceilings and siding boards). Because manufacturing

businesses must invest large amounts of money to start the business, building the factory, buying the machine, so it is difficult to enter the business.

Medium threat of substitutes, it is not difficult to substitute construction materials for the examples, with the same function of roofing we can substitute clay and concrete tiles roof with solar tiles, metal roofing or asphalt shingles.

High bargaining power of customers, even though there are not many producers in this business, customers can change easily from one brand to another brand with no switching cost. They can choose the lowest cost or the most attractive products. It is their decision based on competitive price and quality.

Medium bargaining power of suppliers, there is a lot of suppliers to provide raw materials for roofing products, boards and ceilings and siding boards such as clay, cement, etc. Therefore, the bargaining power of suppliers is low.

Medium competitive rivalry, as discussed earlier, there are few large companies in this business. Therefore, it is not so high competition in terms of price to attract customers to buy the products. Company must improve the high-quality products at a reasonable price to attract the customers. However, as mentioned earlier, the companies in this industry do not use the cost leadership strategy or no price war in the red ocean.

DRT Competitors are listed below.

3.3.1 SCC

Siam Cement Public Company Limited (SCC) is the leading company in the construction material industries and industrial supplies. The company's core business is to operate four types of business, SCG cement-building materials which is the production and sale of cement, roof tiles, ceramic tiles, sanitary wares and fittings, SCG chemical which is the sales of chemicals product such as olefins, polyolefins, SCG packaging which is the sales of printing and writing paper, corrugated boxes and document, other business which is the agricultural machine automotive parts and components.

3.3.2 COTTO

Siam Cement Group Ceramics (COTTO) is the company which produces and distributes a variety of products such as wall tiles and ceramic floor. The company manufactures under the well-known brands COTTO, CAMPANA and SOSUCO. There are 4 factories in Saraburi Province. It provides one-stop service from manufacturing and distribution to installation.

3.3.3 SCCC

Siam City Cement Company Limited (SCCC) was established in 1969. It is the company that is involved in manufacturing of cement-based building materials, light-weight concrete blocks and wood replacement products. The company offers the product under the brand name INSEE. The company provides variety of products, INSEE Cement, including INSEE Concrete, INSEE Mortar, INSEE SUPERBLOCK, INSEE Ecocycle and Conwood. The products are distributed nationwide and exported overseas such as Cambodia, Laos, Myanmar, Vietnam, China and South India.

3.3.4 DCC

Dynasty Ceramic Public Company Limited (DCC) is the company which produces and distribute wall tiles and ceramic floor. The company offers the product under the brand name Dynasty and distribute through its subsidiaries around country such as Dynasty Tiletop Klongklung in Kampaeng Phet province, Dynasty Tiletop Prachin Buri in Prachin Buri province. DCC's products are sold nationwide and exported overseas including Cambodia, Laos, Myanmar, Brunei, Philippines etc.

3.3.5 TOA

TOA Paint (Thailand) Public company limited (TOA) is the company that manufactures and distributes decorative paint and coating and non-decorative paint and coating products such as construction chemical products. There are three main decorative paint and coating products: premium grade paintings and coatings, medium grade paintings and coatings and other decorative products. For non-decorative products include heavy coating products, construction chemicals products, and other non-decorative painting products.

CHAPTER IV VALUATION

4.1 Financial Analysis

In this section, Dupont analysis of ROE, growth analysis over the last 5 years, and some industry-specific financial ratios will be analyzed. The key competitors for DRT are Siam Cement Public Company Limited (SCC) and Dynasty Ceramic Public Company Limited (DCC). Even though SCC is much bigger than DRT, it is the only listed company that has roof tile products. For DCC, its market capitalization is approximately 3 times bigger than DRT and the company has grown during 3 latest years which is similar to DRT. Its product is mainly flooring tiles.

For Dupont analysis of ROE, the formula is shown below. And the ROE by Dupont analysis for the latest 5 years of DRT and ROE of SCC and DCC for 2019 are shown in **Table 4.1**. ROE of DRT is up through the years because of sales or revenue and the net profit margin even though the equity has increased by about 10% during the last 3 years. Its asset also increased by 10%, only the debt decreased.

$$\text{ROE} = \text{Net Profit Margin} \times \text{AT} \times \text{EM}$$

where:

$$\text{Net Profit Margin} = \text{Net Income} / \text{Sales}$$

$$\text{Asset Turnover (AT)} = \text{Sales} / \text{Average Total Assets}$$

$$\text{Equity Multiplier (EM)} = \text{Average Total Assets} / \text{Average Shareholders' Equity}$$

Table 4.1 Dupont Analysis of ROE

DUPONT Analysis	2014	2015	2016	2017	2018	2019	2019 SCC	2019 DCC
Revenue (Million Baht)	4,250	4,174	4,161	4,185	4,415	4,825	458,459	8,190
Net Profit Margin	6.81%	7.93%	9.42%	9.84%	9.58%	11.84%	6.98%	11.88%

DUPONT Analysis	2014	2015	2016	2017	2018	2019	2019 SCC	2019 DCC
Asset Turnover	1.12	1.13	1.22	1.34	1.43	1.49	0.75	0.98
Equity multiplier	1.69	1.62	1.62	1.61	1.51	1.49	2.20	2.37
ROE by Dupont	12.89%	14.49%	18.58%	21.16%	20.78%	26.37%	11.49%	27.56%

DRT management was doing well for the last 5 years even though its growth was relatively flat. However, its net profit margin has increased steadily since 2014. Compared with the competitors in 2019, DRT's net profit margin was higher than that of SCC. In 2019, both DCC and DRT have the similar net profit margin and ROE, while SCC's was about half of that. For the asset turnover, DRT can utilize its assets to generate sales more than SCC and DCC. For the equity multiplier, DRT has a lower equity multiplier, as DRT has less debt and try to minimize debt. Its debt has decreased over time.

Next, growth analysis is analyzed to see the trend and use for the future forecast in the valuation. Data from 2015 to 2019 are taken into consideration. Five financial data are considered, which are total revenues, total expenses, net income, earning per share (EPS), and free cash flow. The results are shown in **Table 4.2**.

For DRT, the revenues are increasing (+3.69%) at a faster rate than the expenses (2.51%) which makes the net income has high compound annual growth rate (CAGR) during 2015-2019, i.e. 14.63%. In other words, DRT manages its expense better than its competitors as revenue growth of SCC and DCC is smaller than expense growth which makes the negative CAGR for net income. Consequently, DRT gets the positive CAGR for EPS which SCC and DCC have negative CAGR for EPS. Even though all three companies have profit, the CAGR for free cash flow is negative but they still have positive free cash flow.

Table 4.2 Growth Analysis of DRT, SCC and DCC

	DRT					CAGR (2015-2019)		
	2015	2016	2017	2018	2019	DRT	SCC	DCC
Total Revenues	4,174	4,161	4,185	4,415	4,825	3.69%	-0.09%	3.33%

	DRT					CAGR (2015-2019)		
	2015	2016	2017	2018	2019	DRT	SCC	DCC
Total Expenses	3,723	3,647	3,661	3,884	4,112	2.51%	1.35%	5.61%
Net Income	331	392	412	423	572	14.63%	-8.36%	-8.24%
EPS	0.32	0.39	0.43	0.45	0.60	17.02%	-8.36%	-9.64%
Free Cash Flow	14.50	(8.11)	6.42	(2.90)	11.03	-6.61%	-35.22%	-530.07%

COVID-19 pandemic started around the end of 2019, but the real effect was the beginning of 2020 for Thailand and countries nearby. Therefore, the comparison between the first 9 months of 2019 and 2020 would be useful for the analysis as shown in **Table 4.3**. Surprisingly, SCC and DCC have positive growth for net profit and EPS while DRT has only positive growth for EPS as DRT repurchased 94 million stocks in May 2020. Even though DRT has negative growth of revenue, its EPS has positive growth as DRT tried hard to manage the expense which makes the net profit growth decreased only 2.5%. Therefore, the pandemic has some effects on these 3 companies, but they managed better in terms of expense.

Table 4.3 Growth Analysis for year 2019 and 2020

	DRT			SCC			DCC		
	9M 2019	9M 2020	Growth	9M 2019	9M 2020	Growth	9M 2019	9M 2020	Growth
Total Revenues	3,767	3,453	-8.4%	346,816	314,375	-9.4%	6,250	6,682	6.9%
Total Expenses	3,173	2,871	-9.5%	310,867	277,102	-10.9%	5,156	5,140	-0.3%
Net Profit	474	462	-2.5%	24,910	26,096	4.8%	735	1,224	66.6%
EPS	0.50	0.51	2.0%	20.76	21.75	4.8%	0.11	0.16	45.5%

Source: www.settrade.com

Finally, as DRT is in the construction industry which relies on the people or company who plan to build the houses or the people who plan to renovate their house, the pandemic will affect their decision and postpone their plans. This can be observed from the decrease in revenue in **Table 4.3**. Moreover, it seems that residential

development is oversupplied, and the sales dropped. From Colliers Thailand, a property consultancy, the sales of residential units are forecasted to drop by 40% year on year in 2020 (Arcibal, 2020). Moreover, Thailand's GDP is forecasted to drop by about 7.1% by IMF. As the average ratio between GDP of construction sector and Thailand's GDP is approximately 2.61%, the construction sector will drop by about 2.8% (**Table 4.4**). In DCF, the growth of construction sector may apply in the calculation.

Table 4.4 GDP Construction Sector

	2015	2016	2017	2018	2019	CAGR 5y	2020F	Growth
Thailand GDP	13,743,463	14,592,595	15,486,551	16,365,572	16,875,891	5.27%	15,677,703	-7.10%
GDP_Construction Sector	379,939	400,421	394,720	410,800	421,430	2.62%	409,648.31	-2.80%
% Construction Sector	2.76%	2.74%	2.55%	2.51%	2.50%			
				Average =	2.61%			

4.2 Discounted Cash Flow Valuation

Discounted cash flow (DCF) is the valuation method used to estimate the intrinsic value of a firm using expected free cash flows in the future, discounted back to the present value.

4.2.1 Pro forma statement

I forecast sales in the future by classifying sales into two components, domestic sales, and international sales, which have proportions of 82% and 18% respectively as of the year 2020. I use construction GDP to be key drivers for domestic sales, by developing the relationship between sales and construction GDP using the linear regression model as shown in **Appendix A**. For international sales, since the products are mainly exported to CLMV countries, I determine future sales by applying the growth rate of CLMV's GDP to existing data for international sales.

The cost of goods sold (COGs) refers to total direct costs incurred by the company in the services or production of goods. I estimate COGs using percent of sales.

Selling, general and administrative expenses (SG&A): since SG&A is period cost which normally composes of a large amount of fixed cost and some part is a variable cost, so I develop the linear regression between SG&A and total revenue to separate fixed and variable cost.

To forecast financial costs, I use the effective interest cost that the firm paid to financial institutions to operate the business, which is calculated from the average last 3-consecutive year of the financial statement.

For tax, I applied the latest corporate tax from the revenue department to calculate tax, which is now 20%.

The statement is shown in **Table 4.5**

Table 4.5 Pro forma statement

Year	2018	2019	2020F	2021F	2022F	2023F	2024F	2025F
Sales	3,949	4,327	4,098	4,283	4,482	4,687	4,915	5,149
Domestic	3,263	3,597	3,362	3,494	3,625	3,755	3,900	4,047
International	686	730	735	789	858	933	1,015	1,102
Other revenue	466	498	447	467	489	511	536	562
Total Revenue	4,415	4,825	4,545	4,750	4,971	5,199	5,451	5,711
COGs	3,242	3,475	3,305	3,455	3,615	3,781	3,964	4,153
SG&A	642	637	635	638	642	645	649	653
Total Expenses	3,884	4,112	3,940	4,093	4,257	4,426	4,613	4,806
EBITDA	787	970	861	914	971	1029	1094	1161
Depreciation	256	256	256	256	256	256	256	256
EBIT	531	714	604	657	714	773	838	905
Financial Cost	8	6	13	11	9	6	4	1
Tax	100	136	118	129	141	153	167	181
Net Profit	423	572	473	517	564	613	667	723
EPS	0.45	0.60	0.50	0.55	0.60	0.65	0.70	0.76

The company has sales starting from 4,098 million baht in the current year (2020) and increases to 5,149 million baht by FY2025, which is 4.7% CAGR. This will make the revenue grow from 4,545 to 5,711 million baht from 2020 to 2025, with 4.5% CAGR. The expenses grow starting from 3,940 million baht to 4,806 million in the same period, with 4.1% CAGR. This leads to the net profit of the company growing from 473million baht to 732 million, with 8.8% CAGR. Earnings per share growth are

starting from 0.50 baht per share in year 2020 increase to 0.76 baht per share in year 2025, which is 8.8% CAGR. However, compared to the pre-COVID year 2019, CAGR is only 4.1%.

4.2.2 Discounted Cash Flow (DCF)

I use discounted cash flow method (DCF) to determine firm value by discounting future year cash flows to the present year. The discount rate that I use is calculated from the weighted average cost of capital.

$$\text{WACC} = w_d r_d (1 - \text{Tax}) + w_e r_e$$

where:

WACC = weighted average cost of capital

w_d = weight of debt

r_d = cost of debt

Tax = corporate tax

w_e = weight of equity

r_e = cost of equity

$$r_e = r_f + \text{Beta} * \text{MRP}$$

where:

r_e = cost of equity

r_f = risk-free (10-year government bond yield)

Beta = relative market risk

MRP = market risk premium

Weight of debt (w_d) and weight of equity (w_e) are calculated from the capital structure of the latest market capitalization as of 30 November 2020 which are 6.99% and 93.01% respectively. The debts include all interest-bearing debt which are bank overdrafts and short-term borrowings from financial institutions, long-term borrowings from financial institutions. The liabilities that are not considered to be debts include account payable and other liabilities that are not bearing the interest cost.

Cost of debt (r_d), I use the average effective cost of debt from the financial statements which is 2.92%.

Tax, I use the latest rate from the revenue department for corporate tax which is 20%

Cost of equity (r_e), we derived from the CAPM equation.

Risk-free rate (r_f), we get the data from 10-year government bond yield from the Thai Bond Market Association on 30 November 2020 which is 1.42%.

Beta, I estimate beta from the relationship between the change in SET TRI and change in DRT's TRI by using linear regression to determine the equation, $SET_TRI = 0.01 + 0.588 * DRT$, using monthly historical data for the last consecutive 5 years. I got the beta 0.588. The details are shown in **Appendix B**.

MRP, I retrieved the market risk premium from Professor Aswath Damodaran (http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html), which is 7.58% and the data was updated on July 1, 2020.

I calculate the WACC, which is 5.63, the calculation is shown in **Table 4.6**.

Table 4.6 WACC Calculation

Beta	0.588
Risk-free (r_f)	1.41%
Market risk premium (MRP)	7.58%
Cost of equity; $r_e = r_f + \text{Beta} * \text{MRP}$	5.87%
Weight of equity; W_e	93.01%
Cost of debt (r_d)	2.92%
Tax	20%
After-tax cost of debt; $r_d * (1 - \text{Tax})$	2.34%
Weight of Debt; W_d	6.99%
WACC; $W_e * r_e + W_d * r_d$	5.63%

Terminal value (TV), I estimate the terminal value from free cash flow.

$$TV = FCF(1+g)/(WACC-g)$$

where:

TV = Terminal value

FCF = Free cash flow

g = perpetual growth of free cash flow, historical growth 2.09%, the details are shown in **Appendix C**.

WACC = Weight average cost of capital 5.63.

I got the discounted cash flow as shown in **Table 4.7**

Table 4.7 Discounted cash flow

Period	0	1	2	3	4	5	Terminal Value
	2020F	2021F	2022F	2023F	2024F	2025F	
EBIT	604	657	714	773	838	905	
Tax	(118)	(129)	(141)	(153)	(167)	(181)	
EBIT after tax	486	528	573	620	671	724	
Depreciation	256	266	267	268	268	269	
Working Capital change	(79)	27	47	48	53	55	
CAPEX	(400)	(272)	(272)	(272)	(272)	(272)	
Cash flow to firm (FCFF)	421	496	522	567	614	666	19,214
Discounted Cash Flow	421	469	468	481	493	507	14,613
PV of Firm value	17,452	mil. THB					
Net Debt	394	mil. THB					
PV of Equity value	17,058	mil. THB					
No. of shares	948	mil. Shares					
EST. SHARE VALUE	17.99	THB					

The firm has operating income start from 486 million baht in 2020 and increase to 724 million baht in 2025 which is 8.30% CAGR. The working capital change is calculated from the difference between working capital for this year and previous year which decreases in year 2020 and increases from the year 2021 to the year 2025. The working capital is calculated from account receivable plus inventory and minus account payable. The company invests in the year 2020 400 million baht for expanding production capacity and has a plan to improve safety and economy of scale in the production line within five years (2020-2025) by launching a smart factory project which is an automated and robot system replacing human labor. The terminal value of the firm is 19,214 million baht (perpetual growth 2.09%) which is 85.39% of total FCF.

The firm has present value of 17,452 million baht is deducted by net debt of 394 million baht, it will make the equity value of the company 17,058 million baht and divide by the number of shares (948 million shares), the estimated share value is 17.99 baht per share as of 31-Dec-2020. This is quite high compare to the latest share price as of 30 December 2020, which is only 5.85 baht per share.

4.2.3 The scale for the Rating

There are three scales of rating based on the difference between the latest market share price and the valuation target price as shown in **Table 4.8**.

Table 4.8 The scale for the rating

Rating Rules	
Buy	10% or Greater upside
Hold	Between 10% upside and 10% downside
Sell	10% or More downside

DRT's stock price is 17.99, which is higher than the latest stock price on 30 December 2020 (5.85 baht per share) by 206%. Therefore, it is in the scale "10% or greater". So, the recommendation from the DCF model is "BUY".

4.2.4 Sensitivity Analysis

Discounted cash flow valuation is derived from many key input factors, such as WACC, terminal growth, cost of debt, cost of equity, etc. These factors affect the stock price. In the analysis, I create the scenarios that demonstrate the sensitivity of these factors by $\pm 5\%$, $\pm 10\%$, $\pm 20\%$, $\pm 30\%$, $\pm 40\%$, and $\pm 50\%$ respectively to key factors to trace the effect of the stock price as shown in **Table 4.9**.

Table 4.9 Sensitivity Analysis

Deviation	Cost of Debt	Price (Baht)	Cost of Equity	Price (Baht)	WACC	Price (Baht)	Terminal Growth	Price (Baht)
50%	4.39%	17.58	8.81%	10.05	8.44%	9.91	3.13%	24.67
40%	4.09%	17.58	8.22%	11.03	7.88%	10.90	2.92%	22.93
30%	3.80%	17.74	7.64%	12.22	7.32%	12.10	2.72%	21.43

Deviation	Cost of Debt	Price (Baht)	Cost of Equity	Price (Baht)	WACC	Price (Baht)	Terminal Growth	Price (Baht)
20%	3.51%	17.74	7.05%	13.69	6.75%	13.59	2.51%	20.13
10%	3.22%	17.91	6.46%	15.55	6.19%	15.49	2.30%	19.00
5%	3.07%	17.91	6.17%	16.69	5.91%	16.65	2.19%	18.48
0%	2.92%	17.99	5.87%	17.99	5.63%	17.99	2.09%	17.99
-5%	2.78%	17.99	5.58%	19.52	5.35%	19.57	1.98%	17.54
-10%	2.63%	18.08	5.29%	21.33	5.07%	21.45	1.88%	17.11
-20%	2.34%	18.08	4.70%	26.16	4.50%	26.51	1.67%	16.31
-30%	2.05%	18.25	4.11%	33.76	3.94%	34.66	1.46%	15.59
-40%	1.75%	18.25	3.52%	47.51	3.38%	49.94	1.25%	14.95
-50%	1.46%	18.43	2.94%	79.90	2.81%	88.94	1.04%	14.36

To compare sensitivity, I also create a spider chart to trace the sensitivity of each key factor as shown in **Figure 4.1**

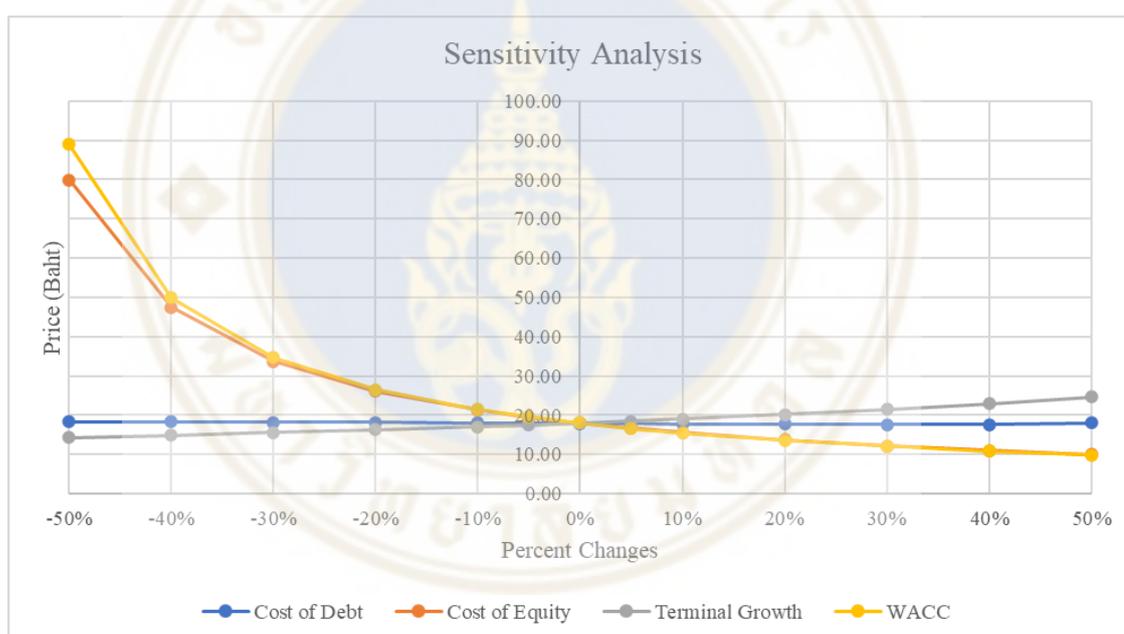


Figure 4.1 Spider chart

From the spider chart, the stock price is most sensitive to the WACC (maximum slope), because it directly discounts future value of free cash flow to the present value. It means that one additional unit of WACC will strongly affect the stock price. The stock price is least sensitive to cost of debt; this is because of the capital structure of the company; it has debt of only 6.99%.

According to sensitivity analysis, the stock price is most sensitive to the WACC. From the calculation, WACC is only 5.91% from cost of equity which is 6.17%, which drives the target price to 17.99 Baht per share.

4.2.5 Share-holder structure

For shareholder structure, the major shareholders of the company are shown in **Tables 4.10**. Most of the investors in DRT are the founding family. Mutual funds held only 5.29% of total shares.

Table 4.10 Major shareholders

Top 10 Major Shareholders(@14 Sep 2020)	Share	%
1. Myriad Materials Co.,Ltd.	487,847,900	51.46
2. DIAMOND BUILDING PRODUCTS PUBLIC COMPANY LIMITED	92,928,700	9.80
3. Bualuang Long-Term Equity Fund	23,947,600	2.53
4. Thai NVDR Company Limited	19,512,237	2.06
5. Bualuang Long-Term Equity Fund 75/25	15,690,400	1.66
6. MR. PRINYA TIEANWORN	13,970,000	1.47
7. Mr. Prakit Pradipasen	12,119,500	1.28
8. Bualuang Siriphol Corporate Governance	10,433,500	1.10
9. Mrs. Siriwan Jungthirapanich	10,000,000	1.05
10. Mr. Satid Sudbuntad	9,000,000	0.95

Source: <https://www.set.or.th/set/factsheet.do?symbol=DRT&ssoPageId=3&language=en&country=US>

The trading volumes per day is 6.22 million baht per day for the first three quarters of this year. But for the last year, the trading volume per day was only 2.32 million baht per day.

Since the major shareholders are the founding family and DRT is a small-cap company, the required equity return should higher than 6.17% to reflect the risk from investment in a relatively illiquid small-cap company. To examine the return of equity, I calculate cost of equity which gives the current market price of the company (5.85 Baht per share) as shown in **Table 4.11**.

Table 4.11 Implied WACC

Stock Price (Baht)	Perpetual Growth	Implied WACC	Implied Cost of Equity
5.85	2.09%	12.70%	13.48%
5.85	0.00%	11.30%	11.97%

From the analysis, I found that the implied cost of equity is higher than 10%. Therefore, the firm's intrinsic value is undervalued, as the implied cost of equity is more than 10%.

All previous analysis is derived from the same beta which is 0.588. It is derived from the SET TRI and DRT TRI. Since DRT is a small-cap company, I also calculate the beta from the relation between MSCI Thailand small cap price index and DRT price index as explained in **Appendix D**. The output beta is 0.575 which lower than the relation between SET TRI and DRT TRI. To examine the required return on equity, I recalculate cost of equity which gives the current market price of the company for new beta as shown in **Table 4.12**.

Table 4.12 Implied WACC for new beta

Stock Price (Baht)	Perpetual Growth	Implied WACC	Implied Cost of Equity
5.85	2.09%	12.70%	13.48%
5.85	0.00%	11.30%	11.97%

From the analysis, the new implied cost of equity which is derived with the new beta estimate is still higher than 10%. This confirms that the stock price of DRT is undervalued, as the implied cost of equity is more than 10%.

To verify whether the value of the stock is undervalued or not, I also recalculate WACC using expected return from dividend yield of 7.45% plus dividend growth of 3.57% (Yr2017-2020) which is 11.02%. Therefore, the WACC is equal to 10.42%, and the target stock price is 7.51 baht per share. This new WACC estimate is also less than the implied WACC, therefore it can be concluded that DRT's stock is undervalued.

From analysis of the three cases, we conclude that the DRT stock is undervalued.

4.3 Valuation recommendation

According to the DCF valuation, the estimated stock value as of 31-Dec-2020 is 17.99 baht per share. Since many factors can affect the stock price, I combine factors that affect the value of the stock which are cost of debt, cost of equity, and perpetual growth as shown in **Table 4.13** to analyze possibly the range of target prices.

Table 4.13 Possible factors

Possible factors		Percent (%)
Cost of Debt		2.92%
Cost of equity	Base Case	5.87%
	MSCI Thailand small cap	11.50%
Perpetual Growth	Historical growth	2.09%
	GDP Construction Sector growth	2.62%

Then calculate WACC and stock price from combined possible factors, the output is shown in **Table 4.14**.

Table 4.14 Range of stock price

Cost of Debt	Cost of Equity	WACC	Perpetual Growth	Stock Price (Baht/share)
2.92%	5.87%	5.63%	2.09%	17.99
2.92%	11.50%	10.86%	2.09%	7.12
2.92%	5.87%	5.63%	2.62%	20.81
2.92%	11.50%	10.86%	2.62%	7.46

From the analysis, the range of DRT stock price varies from 7.12 to 20.81 baht per share.

I run DCF model with an expected return of 11.02% and vary the perpetual growth as shown in **Table 4.15**.

Table 4.15 Expected return

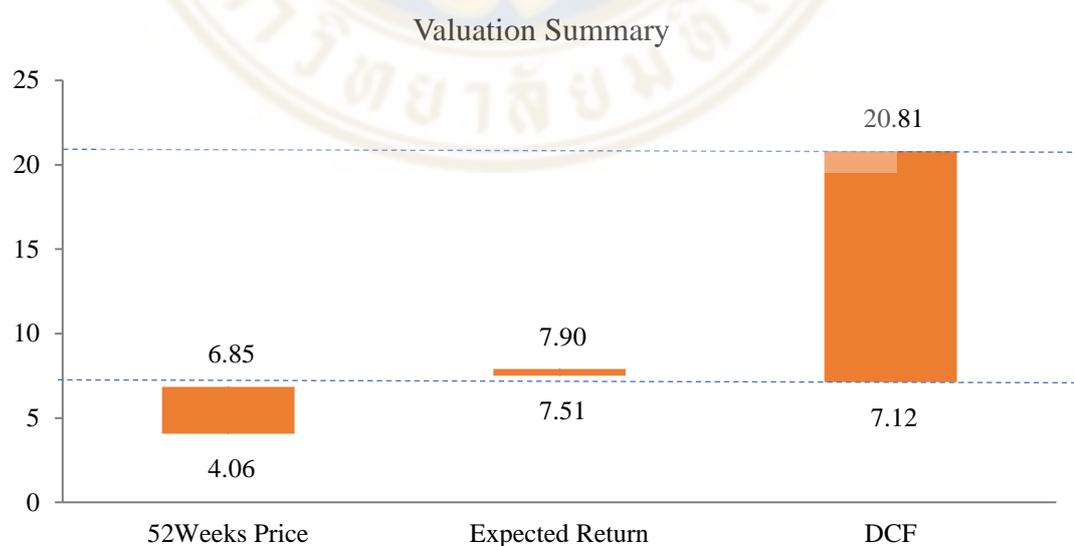
Expected return with various growth rate		Percent (%)
Cost of Debt		2.92%
Cost of equity		11.02%
Perpetual Growth	Historical growth	2.09%
	GDP Construction Sector growth	2.62%

The output stock price after I use the same cost of debt and cost of equity by varying the growth rate from 2.09% to 2.62%, the stock price is 7.51 Baht per share and 7.90 Baht per share, respectively as shown in **Table 4.16**.

Table 4.16 Stock price

Cost of Debt	Cost of Equity	WACC	Perpetual Growth	Stock Price (Baht/share)
2.92%	11.02%	10.42%	2.09%	7.51
2.92%	11.02%	10.42%	2.62%	7.90

I illustrate the DRT stock price using football field from above information added with the last 52 weeks price as shown in **Figure 4.2**.

**Figure 4.2 Football field for DRT**

The range of the target DRT stock prices is as shown in **Table 4.17**.

Table 4.17 Price comparison

Valuation	Lower	Upper
52 Weeks Price	4.06	6.85
DCF	7.12	20.81
Expected Return	7.51	7.90
Target Price	7.51	
Upside	28%	

The price is widely range from 4.06 to 6.85 baht per share for the last 52 weeks. According to the analysis, for DCF, it generates the price between 7.12 to 20.81 baht per share, while using expected return to calculate the stock price, it has the price between 7.51 to 7.90 Baht per share. I set the target price based on expected return, the target price is 7.51 baht per share.

Therefore, the appropriate target price for DRT is 7.51 baht per share which is higher than the latest price on 30 December 2020 (5.85 baht per share) about 28%. Therefore, it is in the scale of rating “10% or Greater upside”, my recommendation for DRT is “BUY”.

CHAPTER V

INVESTMENT RISKS AND DOWNSIDE POSSIBILITIES

In this chapter, investment risks and downside possibilities are clarified. A risk matrix is applied which presents the downside possibilities for DRT as shown in **Table 1**. The risk matrix takes into account two factors, i.e. likelihood and impact.

Table 1 Risk Matrix

Risk Matrix		IMPACT				
		Insignificant	Minor	Moderate	Major	Severe
LIKELIHOOD	Almost Certain					
	Likely		Rules and regulations, Government policy			
	Possible		Economic risk	Consumer Behavior risk, Modern trade policy risk, Alternative material risk		
	Unlikely			Currency risk, Interest rate risk		
	Rare			New competitor risk		

For the type of investment risks, there are 5 risks relating to DRT's business, which are

1) *Consumer Behavior Risk*

Since roofing technology has rapidly developed, the fiber cement roof (DRT's product) can be replaced by metal sheets that have better quality than fiber cement in many dimensions, e.g. more colorful, durable, lighter weight, and cheaper price. Some customers prefer metal sheets because it has more flexible design to meet customer needs. However,

some customers still prefer the normal roof as they do not believe the quality of new material.

Moreover, people may change their behavior to live in the high rise building instead of a house. Therefore, the demand for roof tiles in the future could be reduced, especially in urban area.

2) *Currency risk*

About 36.45% of raw materials such as asbestos, synthetic fibers and paper pulp, etc. are imported from overseas. Therefore, the exchange rate is a key factor affecting the cost of raw materials. However, DRT tried harder to use the material from domestic sources (39.45% in 2018 to 36.45% in 2019) which can reduce some currency risk from purchasing materials. For the currency exchange rate, if Thai baht tends to depreciate for next year, the cost of raw materials will increase. On the other hand, if the Thai baht appreciates, the export revenues will suffer. From the data in annual report, cost of imported material ($\approx 36.45\%$ of cost of goods sold) was more than the exports ($\approx 20\%$ of sales). So, if the baht depreciates, cost of goods sold will increase and profit will be reduced.

3) *Rules and regulations*

The sales revenue of DRT is made in the construction sector which depends on personal credit and mortgage loans provided by banks. The Bank of Thailand has a policy to control personal credit risk by issuing Loan-to-Value (LTV) measures regarding the down payment for the house. Certainly, changes in this policy may affect the sales for DRT.

4) *Economic risk*

Since the COVID-19 pandemic, the local economy went into a downtrend since the beginning of the year. So, the purchasing power of the customers is lower compared with last year, which leads to lower sales revenue for the whole year.

5) *Interest rate risk*

The interest-bearing debt of the company is about 7%. It normally comes from short-term loans such as bank overdrafts or short-term borrowings from financial institutions. Therefore, it will affect the interest that

company must pay for bank. However, now the policy interest rate is reduced so it would give the benefit to the company for borrowing money to invest.

Moreover, other qualitative risks are revealed here.

- *New competitor risk*: As roof tile manufacturers in China have low production costs, some importers or traders may become new competitors. The company may lose some sales or even the profit margin to compete with the price in the red ocean market.
- *Alternative material risk*: Nowadays there are many products or materials that can replace the roof tiles, e.g. metal sheet roofs, metal sheet roofs with PU foam, APVC roof, shingle roof, etc. The new material can solve the problem of the heavy roof tiles, but they are more expensive than the traditional ceramic roof tiles. DRT realizes the risk, so DRT diversifies its business to sell other construction materials as well (ceiling boards, siding boards and installation services).
- *Government policy*: This risk depends on the government. If the government want more people own a house, the Thai government may issue a policy to stimulate more people to buy the house with low-interest rate or tax benefits. So, this sector will gain the benefit from that policy and vice versa.
- *Modern trade policy risk*: As DRT's products are sold by modern trade, the profit margin depends on the negotiation with the large retail outlets. Sometimes the modern trade wants to get more profit from the suppliers so the rebate policy may be raised. DRT may have to pay for the rebate later which makes the profit margin lower.

CHAPTER VI

CONCLUSIONS

In this paper I apply the discounted cash flow (DCF) valuation method, to estimate the intrinsic value of a firm using expected free cash flows in the future, discounted back to the present value.

For this analysis, I estimated the cost of equity at 5.87% (with weight of 93.01%), the cost of debt at 2.92% (weight of 6.99%), giving a WACC of 5.63%. Based on the DCF valuation model, the stock price target is 17.88 baht per share as of 31 December 2020, providing 206% upside compared to the latest price as of 30 December 2020 of 5.85 baht per share.

Furthermore, I run sensitivity analysis based on possible factors, cost of equity, cost of debt, terminal growth. The output range of stock price varies from 7.12 to 20.81 baht per share, which is still higher than the latest stock price.

Since DRT is a small-cap company, therefore the required cost of equity should be higher than return from the market to compensate for liquidity risk, and the higher business risks of small caps. Therefore, I also recalculate beta from relation between MSCI Thailand small cap price index and DRT price index. Then, I re-estimate the stock price with new beta, giving a target price of 18.50 baht per share.

Moreover, to verify whether the stock is undervalued or not, I run the financial model to find the stock value equal to market price with the perpetual growth of 2.09%, and the stock value equal to market price with no growth (zero perpetual growth) and the yield plus growth model to determine the cost of equity. All implied costs of equity are higher than 10%, supporting the conclusion that the DRT stock is undervalued.

To determine the target value of the stock price, I compare the range of stock prices from DCF model with the past 52 weeks of stock price and price estimation using a higher discount rate from the yield plus growth model. The appropriate price is equal to 7.51 Baht which is upside 28% from the latest price as of 30 December 2020 (5.85

baht per share). It is in the scale of rating “10% or Greater upside”, therefore my recommendation for DRT is “BUY”.

6.1 Triggers for re-assessment

DCF valuation is based on many key factor assumptions including cost of equity, cost of debt, terminal growth. These are key triggers to re-assess the value of the stock.

Cost of equity, it depends on shareholders’ required rate of return. For DRT the major shareholders are the founding family. The key trigger point to re-assess the stock value when there is a significant change in the structure of shareholders.

Cost of debt, the company has debt from short-term borrowing from financial institutions. The interest rate is defined by financial institutions which is based on Bank of Thailand policy rate. Therefore, the valuation should be re-assessed every time Bank of Thailand announces new policy rate.

Terminal growth, to justify terminal growth, I have to compare to many factors such as economic growth which is issued by NESBD every quarter, historical performance of the company which depend on company policy launching by board of director. Therefore, it should be considered to re-assess the stock value quarterly or it has the change in board of directors, because they may launch new business model.

6.2 Limitations

For the limitations of DCF valuation, DCF valuation is extremely sensitive to key assumptions including perpetual growth rate which generates terminal value (around 70-80% of firm value) and discount rate (WACC) which discount the future cash flow to the present value. It is difficult to estimate free cash flow, the perpetual growth rate and WACC with high confidence level because it requires a lot of assumptions and details. Especially the perpetual growth rate, because small changes in the perpetual growth rate can significantly change the intrinsic value or fair value of the

stock. Moreover, DCF valuation does not consider the relative valuation compared to peers in the industry. Therefore, to use DCF valuation for estimating intrinsic value, it is important to concentrate on each key assumption. The good part of using DCF valuation, it can determine implied WACC, the current market share price can be the input to determine the implied WACC and the implied cost of equity. The implied cost of equity can be used to verify how much the share price is over-valued or under-valued relative to each investor's own personal required return threshold.



APPENDICES

Appendix A: Domestic sales forecasting

The domestic sales increase from 1,903 million baht in 2005 to 3,596 million baht in 2019, with 4.65% CAGR, as shown in **Figure A-1**.



Figure A-1 Domestic sales

Since DRT is the firm that produced construction materials, therefore I choose the construction sector GDP to be the key driver for domestic sales. It starts from 7,614,411 million baht in 2005 and gradually grew to 16,875,891 million baht in 2019, with 5.85% CAGR, as shown in **Figure A-2**.



Figure A-2 GDP construction sector

The line graph shows the GDP construction sector (million baht) over a fifteen-year period (2005-2019). GDP construction sector steadily rose 5.85% CAGR from 2005 to 2019.

To determine the relationship between domestic sales and the construction sector GDP growth, I apply linear regression analysis using Data Analysis in Excel as shown in **Table A-1**. I also plot the relation between DRT's domestic sales and construction sector GDP as shown in **Figure A-3**.

Table A-1 Regression Statistics

Regression Statistics	
Multiple R	0.84187325
R Square	0.708750568
Adjusted R Square	0.686346766
Standard Error	317.0320006
Observations	15

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	3179639.534	3179639.534	31.63528022	8.27636E-05
Residual	13	1306620.762	100509.2894		
Total	14	4486260.296			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	457.2667717	439.4294406	1.040592026	0.317031978	-492.0628185	1406.596362	-492.0628185	1406.596362
X Variable 1	0.00741401	0.001318158	5.624524888	8.27636E-05	0.004566304	0.010261716	0.004566304	0.010261716

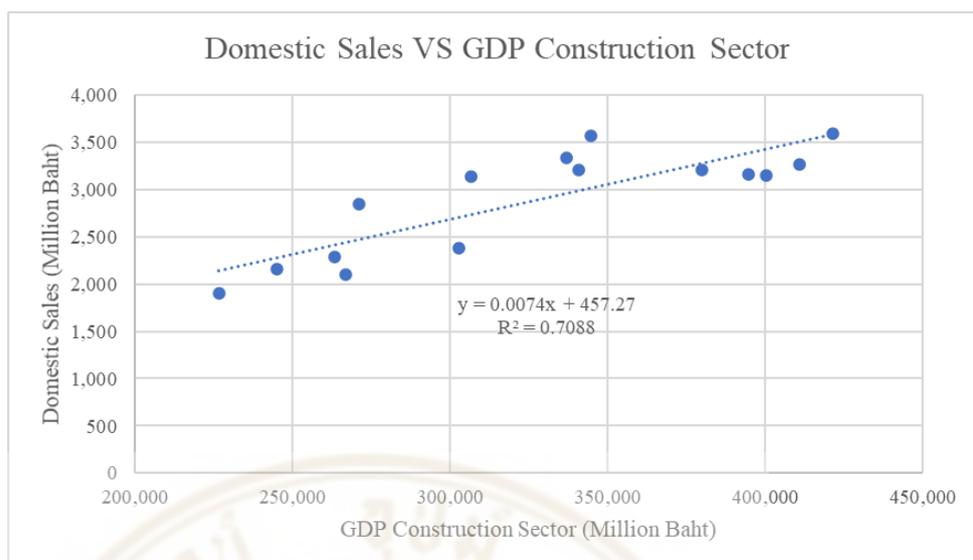


Figure A-3 Scatter plot

From the analysis, the equation is

$$\text{Domestic Sales} = 0.0074 * \text{GDP Construction Sector} + 457.27 \quad (r^2=0.71)$$

The r^2 is 0.71. It can be concluded that GDP construction sector can explain 71% of the variation in DRT's domestic sales, and GDP construction sector variable is significant ($P = 8.27 \times 10^{-5}$) in the equation.

Then use the equation to predict domestic sales for the forecast period 2020-2025. The latest data that are provided by SET is the third quarter of Year 2020. Therefore, to compare the output from the equation with existing data. I estimate domestic sales for year 2020 using the above equation. I got domestic sales of 3,362 million baht then compare to the existing data. Nevertheless, the data are provided only three quarters of year 2020, so I expand three-quarters of domestic sales to a year (2020) by using the same proportion for year 2019 as shown in **Table A-2**.

Table A-2 Year 2020 Estimation

Year	Data	Sales Revenue (mil. Baht)
Year 2019	The first three quarters of the year 2019	3,693.43

Year	Data	Sales Revenue (mil. Baht)
	The whole year of 2019	4,747.55
	Expansion factor	1.29
Year 2020	The first three quarters of the year 2020	3,427.67
	Expansion factor (same as the year 2019)	1.29
	The whole year of 2020	4,405.94
Linear Regression forecast		4,097.92
Difference		-6.99%

The difference between forecasted output and existing data is 6.99%. Moreover, I have checked the latest EPS from the financial statement which is 0.51 Baht per share compared to the estimated 0.50 baht per share, or 1.97% difference. Therefore, the equation is acceptable to use to forecast domestic sales in the future.

Appendix B: Beta

To calculate beta, I use the relation between SET total return and DRT's total return to determine the beta by using linear regression analysis. I choose historical 5-year monthly data to estimate the beta.

For total return index as shown in **Figure B-1**.

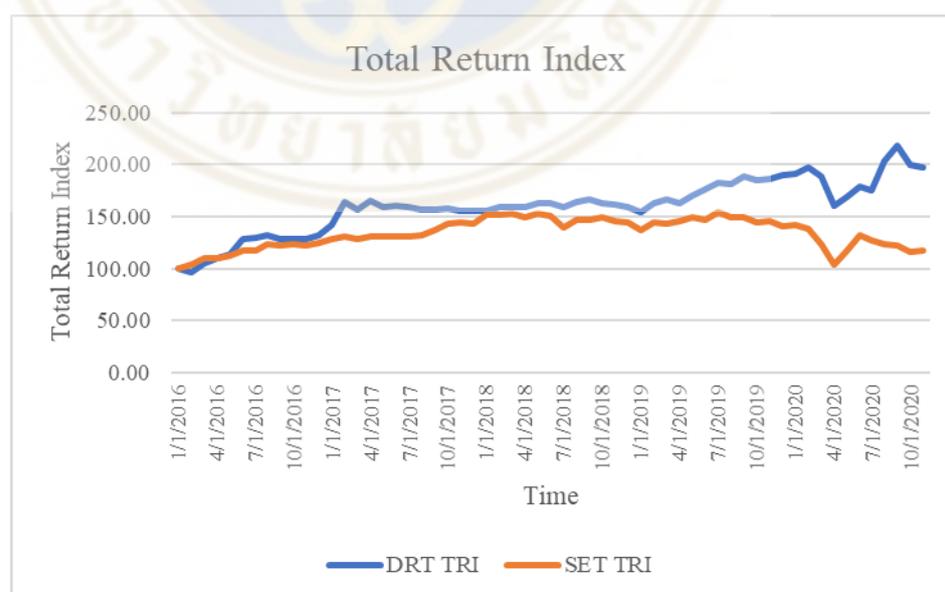


Figure B-1 Total return index

I use total return index (TRI) to calculate total return of the stock and total return of SET. For the last 5-year, SET has average total return of 3.34% per annum and it has SD 15.85% per annum. For DRT it has average return of 14.24% per annum and it has SD of 17.35% per annum as shown in **Table B-1** and **Figure B-2**.

Table B-1 Average total return and SD

Index	Annualized	SD
SET Total return	3.34%	15.85%
DRT total return	14.24%	17.35%

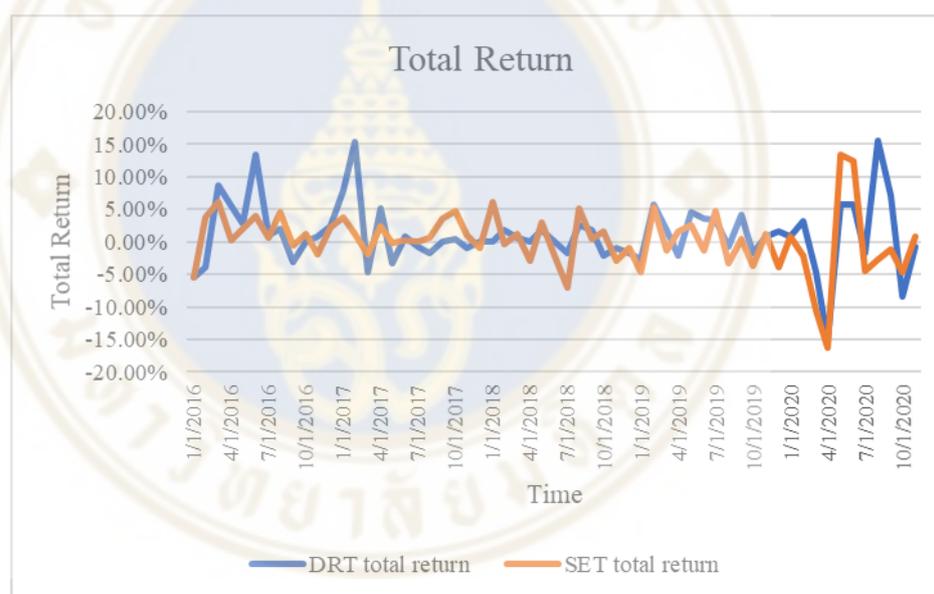


Figure B-2 Total return

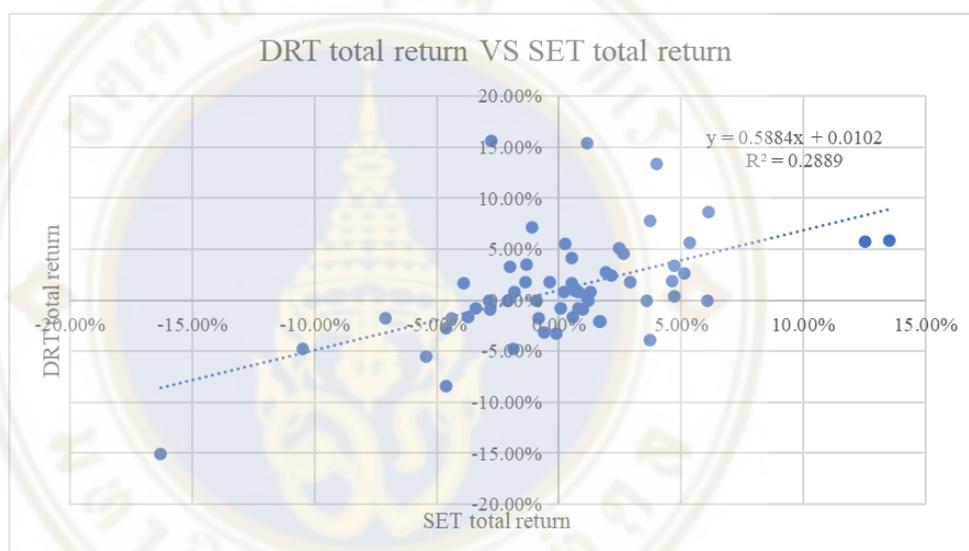
To estimate beta, I use Data Analysis in Excel as shown in **Table B-2**, and scatter plot between DRT total return and SET total return as shown in **Figure B-3**.

Table B-2 Beta estimation using Data Analysis in Excel

Regression Statistics	
Multiple R	0.53753
R Square	0.28894
Adjusted R Square	0.27647
Standard Error	0.04297
Observations	59

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.04276	0.04276	23.16201	0.00001
Residual	57	0.10524	0.00185		
Total	58	0.14800			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.01023	0.00560	1.82466	0.07329	-0.00100	0.02145	-0.00100	0.02145
X Variable 1	0.58843	0.12227	4.81269	0.00001	0.34360	0.83326	0.34360	0.83326

**Figure B-3 Scatter plot**

From analysis,

$$\text{DRT total return} = 0.5884 * \text{SET total return} + 0.010 \quad (r^2=0.289)$$

The r^2 is equal to 0.289. It can be concluded that the SET total return can explain 28.9% of the variation in DRT stock returns, and from the equation, the beta is 0.588.

Appendix C: Perpetual growth rate

The concept to determine perpetual growth is to compare sales revenue (as shown in **Figure C-1**) growth rate between each period and to compare sales revenue growth rate with GDP as well.

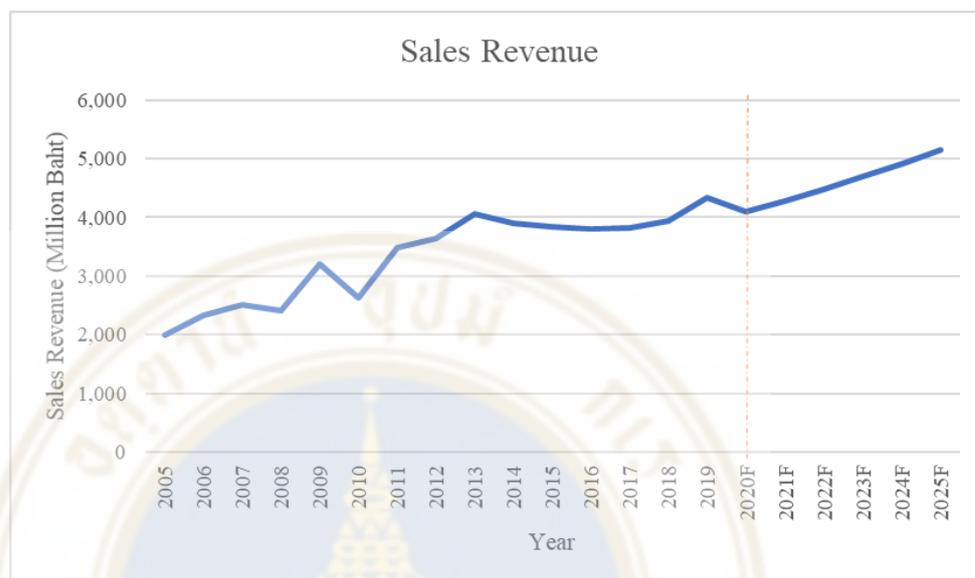


Figure C-1 Sales revenue

The line graph illustrates DRT's sales revenue (million baht) over twenty-year period including historical data (2005-2019) and forecasted data (2020F-2025F). The sales revenue went up gradually to 5.66% CAGR from 2005 to 2019. For the forecast period, the sales revenue increase by 4.67% CAGR from 2020F to 2025F.

To determine perpetual growth, I compare the growth rate for each period using CAGR with GDP growth rate as shown in **Table C-1**.

Table C-1 Growth rate comparison

Reference	Period		Growth
DRT	Historical data	5Year 2014-2019	2.09%
	Historical data	10Year, 2010-2019	3.08%
	Forecast	2020F-2025F	4.67%
	Pre COVID19	2019-2025F	2.94%
	Specific Period	2015-2025F	2.99%
GDP	Historical Data	2014-2019	4.99%
	Forecast (IMF)	2020F-2025F	4.72%

Reference	Period		Growth
GDP	Pre COVID19	2019-2025F	2.55%
GDP Construction Sector	Historical Data	2014-2019	4.57%
	Forecast (IMF)	2020F-2025F	4.32%
	Pre COVID19	2019-2025F	2.34%

According to growth rate comparison, the range of growth rates is between 2.09% to 4.99%. In my opinion, the appropriate growth rate to represent perpetual growth rate is 2.09%, because it is the latest performance of the company for last consecutive five years and it is assumption for perpetual growth. Moreover, the growth rate is close to the growth rate of GDP construction sector for post-COVID19 period of 2.34% per year.

Appendix D: Beta (Small Cap Index)

To calculate beta for small-cap company, I use the relation between MSCI Thailand small cap price index and DRT's price index to determine the beta by using linear regression analysis. I choose historical 5-year monthly data to estimate the beta.

For price index is shown in **Figure D-1**.

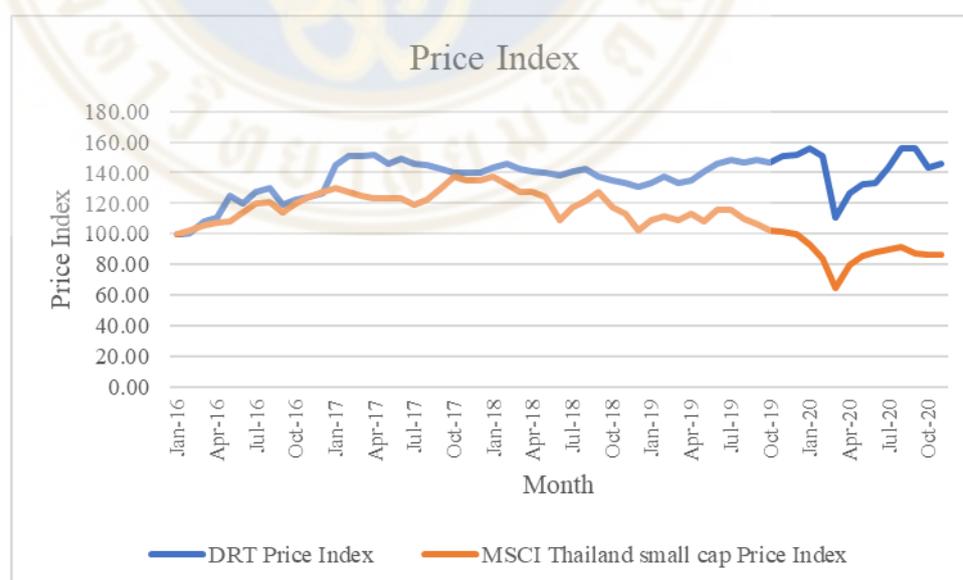


Figure D-1 Price index

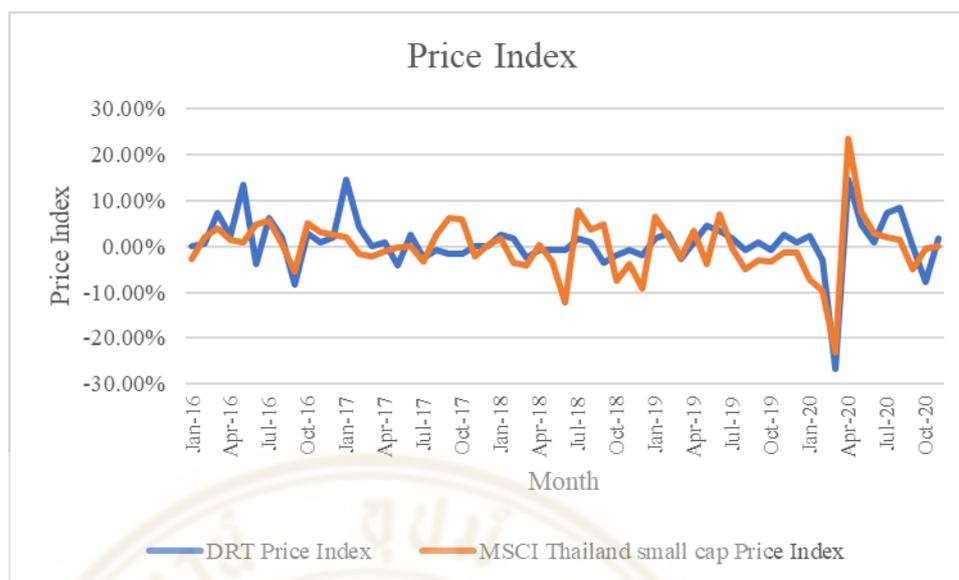


Figure D-2 Price Return

To estimate beta using Data Analysis in Excel is illustrated in **Table D-1**.

Table D-1 Beta estimation using Data Analysis in Excel

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.62615
R Square	0.39207
Adjusted R Square	0.38140
Standard Error	0.04464
Observations	59

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0.07325	0.07325	36.76013	0.00000
Residual	57	0.11359	0.00199		
Total	58	0.18684			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00869	0.00581	1.49442	0.14058	-0.00295	0.02033	-0.00295	0.02033
X Variable 1	0.57498	0.09483	6.06301	0.00000	0.38508	0.76488	0.38508	0.76488

From analysis,

$$\text{DRT} = 0.575 * \text{MSCI} + 0.008 \quad (r^2=0.392)$$

Therefore, the beta is 0.575

REFERENCES

- Bloomberg. (2020, December). *Diamond Building Products PCL*. Retrieved from <https://www.bloomberg.com/quote/DRT:TB>
- Damodaran, A. (2020, July 1). Retrieved from NYU:
http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprim.html
- DRT. (2020). *Annual Report 2019*. Retrieved from <https://drt.listedcompany.com/misc/ar/>
- Euromonitor. (2020, December). *Thailand Country Factfile*. Retrieved from <https://www.euromonitor.com/thailand/country-factfile>
- IMF. (2020, December). *Thailand*. Retrieved from <https://www.imf.org/en/Countries/THA#countrydata>
- Investing. (2020, December). *Diamond Building Products PCL (DRT)*. Retrieved from <https://www.investing.com/equities/diamond-build>
- MSCI. (2020, November). *End of day index data search*. Retrieved from <https://www.msci.com/end-of-day-data-search>
- MSCI. (2020, November). *MSCI Indexes*. Retrieved from https://app2.msci.com/products/indexes/performance/country_chart.html?asOf=Dec%2004,%202020&size=33&scope=C&style=C¤cy=0&priceLevel=0&indexId=64447#
- MSCI. (2020, November). *MSCI Thailand Small Cap Index*. Retrieved from <https://www.msci.com/documents/10199/8c19bd77-5fda-4848-ad94-6497ce8e7bb0>
- NESDB. (2020, December). *NESDB*. Retrieved from https://www.nesdc.go.th/main.php?filename=qgdp_page

- Plecher, P. &. (2020). *Thailand - share of economic sectors in the gross domestic product 2019*. Retrieved from <https://www.statista.com/statistics/331893/share-of-economic-sectors-in-the-gdp-in-thailand/>
- Reuters. (2020). *Diamond Building Products PCL*. Retrieved from <https://www.reuters.com/companies/DRT.BK>
- SCB. (2020, December). *BETA*. Retrieved from <https://res.scbsonline.com/THA/document/beta>
- SET. (2020). *DIAMOND BUILDING PRODUCTS PUBLIC COMPANY LIMITED*. Retrieved from https://www.set.or.th/set/factsheet.do?symbol=DRT&ssoPageId=3&language=en&country=US#_ga=2.227443038.234005175.1606704194-16753335.1592109302
- SETSMART. (2020). *DIAMOND BUILDING PRODUCTS PUBLIC COMPANY LIMITED*. Retrieved from <https://www.setsmart.com/ssm/financialStatement;symbol=DRT>
- Settrade. (2020). *Clarification on Operating Results for the 3rd quarter and 9-month period ending September 30*. Retrieved from <https://portal.settrade.com/simsImg/news/histri/202011/20128037.pdf>
- ThaiBMA. (2020, November). *Government Bond Yield Curve*. Retrieved from <http://www.thaibma.or.th/EN/Market/YieldCurve/Government.aspx>
- Tradingview. (2020, December). *DIAMOND BUILDING PRODUCTS PUBLIC COMPANY*. Retrieved from <https://www.tradingview.com/symbols/SET-DRT/>