

**DISCOUNTED CASH FLOW VALUATION OF ORIGIN
PROPERTY PUBLIC COMPANY LIMITED**

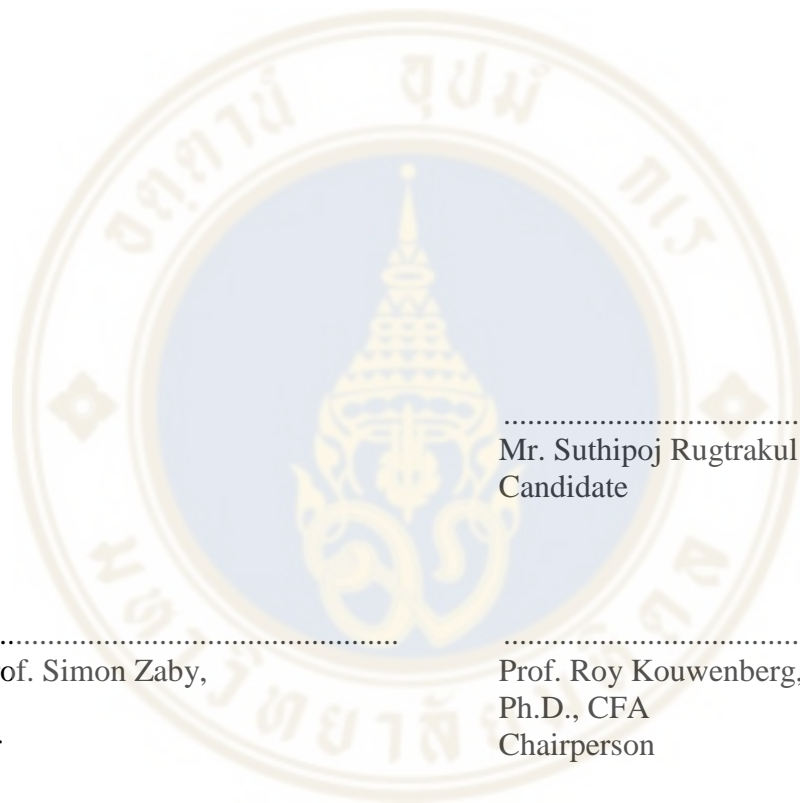


**A THEMATIC PAPER SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR
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**DISCOUNTED CASH FLOW VALUATION OF ORIGIN
PROPERTY PUBLIC COMPANY LIMITED**

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I am proud to be the part of Mahidol University student. I hereby to promise to use my wisdom for the greatest good, with ethics and knowledge, for our community and country.

Suthipoj Rugtrakul

DISCOUNTED CASH FLOW VALUATION OF ORIGIN PROPERTY PUBLIC COMPANY LIMITED

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ABSTRACT

Discounted Cash Flow method is one of the most used method to perform company's valuation. In this thematic paper, discounted cash flow method of valuation was applied to find proper valuation for real estate company, Origin property development public company limited. We also considered and analyzed an economics climate of Thailand to further understand how well Origin property development public company limited will performed by the end of 2022.

Discounted cash flow method involves multiple financial key elements forecast, terminal growth rate, weight average cost of capital and earning forecast. This will yield us the result in value of share in THB. This valuation method was applied to company's financial profile in tandem with relative multiple valuation method conducted by colleague.

The result suggests that the share value of Origin property development public company limited will be 13.82 THB per share by the end of 2022. We also calculated an average between discounted cash flow method with relative valuation, including valuation from two other financial institutions. Average price consensus is 13.52 THB per share.

KEY WORDS: DCF/ Discounted cash flow/ Valuation/ Terminal growth/ Target price

34 pages

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CHAPTER I

“GETTING TO KNOW ORIGIN PCL.”

Origin Property development conducts their business mainly on developing condominiums and housing along BTS and MRT (Mass Transit System) around the Bangkok area and its vicinity. The company focuses on rental, resale, and property development businesses. This valuation report mainly discussed valuation of the company using 2 different approaches: Discounted Cash Flow approach and Multiple approach under COVID-19 pandemic situation and Thailand’s economic situations.

1.1 Business Description

1.1.1 Who is ORIGIN PROPERTY PCL?

Origin Property Public Limited (SET: ORI) was established as a limited company on December 16, 2009, by Peerapong Jaroon-ek and Arada Jaroon-ek with registered capital of 10.0 million Thai Baht. The business was registered as a real estate development company. Origin Property focusses on various kinds of property development projects such as real estate development business, development of residential condominiums, housing projects, industrial estates in Bangkok and its surrounding area. Origin Property is known for its uniqueness for the designs, and combination between design and its functionality, the main emphasis of the company is its properties’ location which is in proximity with BTS and MRT (Bangkok Mass Transit system).

Currently Origin Property Public Limited company is operated by subsidiaries and a corporation of 60 companies, where its subsidiaries are responsible for various types of business functions. Origin has received a lot of positive recognition from various locations which are in proximity with Bangkok Mass Transit systems (BTS and MRT) for instance Bearing BTS in Samut Prakan, MRT-Green Line: Mo Chit-

Saphan Mai-Khu Khot section. MRT Purple Line: Central City of Sathorn, Ramkhamhaeng, Minburi.

Aside from Origin's property development business, the company also focuses on property operation services such as condominium tenant management services, condominium juristic person management services which operates under Primo Service Solution Company Limited. Recently, the company improved its revenue recognition apart from selling real estate development projects by operating build-to-rent property development to create a continuous and recurring income stream that operates under one of its subsidiaries, One Origin Group Company Limited to give Origin Property Public Limited a stable income stream to boost its stability. (Origin Property PCL 2021 Annual Report.)

1.1.2 Understanding Company Products and Services

Origin Property Public Limited's property and real estate development projects can be categorized into multiple projects depending on its designing concept and target group from each specific area. Currently Origin Property Public Limited has 4 primary condominium brands: Park Luxury, KnightBridge, The Origin, Notting Hill and Kensington. And one housing development brand, Britannia. The company has created multiple branding to target different groups of consumers from different areas. Kensington as mid-level condominium product, Notting Hill as mid-upper to mid level condominium product, The Origin (mid-upper mid level), Knight bridge as upper mid-high-level product and lastly Park Origin being their most premium condominium product. Another housing development project or so-called horizontal development project is called 'Britania' housing project which aims for consumers who prefer to live in more spacious living space. The company tries to develop multiple product lines to suit each consumer group categorized by income range and area they live in. (Origin Annual Report, 2021)

Aside from real estate development projects, Origin property public limited also operates business services that are related to real estate. Origin operates these businesses through its own subsidiary company called Primo Service Solution. Primo Service Solution offers services such as tenant services, condominium juristic person management services.



Figure 1.1 Origin Properties PCL Company Structure

(Source: ORIGIN Properties plc.'s website, 2022)

1.1.3 Origin Properties' Income sources

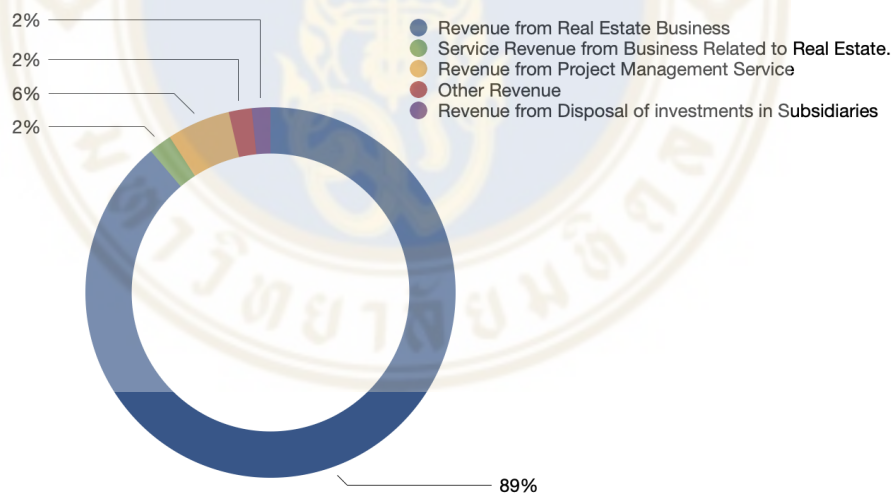
Origin Property Public Limited's revenue structure can be categorized by its product line and business group as follows. The company has 2 business structures: real estate development business and service businesses related to real estate. Origin Property Public Company has divided its type of revenue structure into 6 different categories: revenue from real estate business, revenue derived from service related to real estate, revenue from project management service, revenue from transfers of land sale contracts, revenue from the disposal of investment subsidiaries and other revenue.

As of fiscal year end of 2020, revenue from real estate business accounts for 88.80 percent. Followed by revenue from project management service of 5.54 percent. Service revenue from business related to real estate accounts for 2.03 percent. And lastly other revenue of 2.00 percent and revenue from the disposal of investments in subsidiaries of 1.63 percent with no revenue from transfers of land sale contracts. (Origin Annual Report, 2021)

Table 1.1 Origin Property Revenue Structure

Type of Revenue	Operated by	Shareholding Percentage	Consolidated Financial Statements***					
			Fiscal Year 2018		Fiscal Year 2019		Fiscal Year 2020	
			Thousands of Baht	Percentage	Thousands of Baht	Percentage	Thousands of Baht	Percentage
Revenue from Real Estate Business	The Company and Subsidiaries	99.99	14,523,121.2	87.29	12,278,599.7	86.95	9,870,483.01	88.80
Service Revenue from Business Related to Real Estate *	The Company	99.99	64,228.3	0.39**	174,969.8	1.24	225,252.36	2.03
Revenue from Project Management Services	The Company and Subsidiaries	99.99	1,225,925.9	7.37**	918,893.5	6.51	615,214.68	5.54
Revenue from Transfers of Land Sale Contracts	The Company and Subsidiaries	99.99	311,977.5	1.88**	564.0	0.00	-	-
Other Revenue	The Company and Subsidiaries	85.0 - 99.99	197,758.7	1.19	290,537.6	2.06	222,423.51	2.00
Revenue from the Disposal of Investments in Subsidiaries	The Company and Subsidiaries		314,821.6	1.89	458,557.8	3.25	180,759.41	1.63
Total Revenue			16,637,833.3	100.00	14,122,122.3	100.00	11,114,132.97	100.00

(Source: Origin Annual Report, 2020.)

**Figure 1.2 Origin Property Revenue Structure by Percentage**

(Source: Origin Annual Report, 2020.)

1.1.4 How do Origin Properties Compete in Real Estate Business?

Emphasis on location

The company gives the greatest emphasis on the project's location as their primary decision on where to build their real estate development projects, as it is one of the most important factors when consumers choose to buy their real estate properties. Two of the most important factors that Origin Property is aiming to achieve is to build their properties near major transportation routes like BTS and MRT lines, and must be also convenient, for example, in Bangkok and its surroundings. Another factor that Origin Property uses to make decisions where to build their property development is job demands and job quality in that area with jobs selections. This will increase the likelihood of their customer to have greater purchasing power, this results in Origin aiming to develop their project near the industrial area and Eastern Economic Corridor (EEC).

Unique design under various product brands

Origin Property has multiple condominium development projects and housing development projects. The company is aware that one of the most important factors for consumers to decide whether to buy the property or not is its design language. Under different projects which are categorized under different branding, the company can create different designs for different locations under the concept called 'EMPATHY' which pays close attention to each unique individual customer.

Blue Ocean marketing strategy

Origin Property development tries to use blue ocean marketing strategy to avoid repetitive experience with its competitors by using unique design under the concept of condominium space maximization. By using blue ocean marketing strategy, company's executives believe that they can differentiate themselves from its competitors to further create competitive advantage. Another aspect that the company places great emphasis on is to cater toward foreign (expats) customers due to the growth of international business. These customers are Japanese, Chinese, Taiwanese, and Singaporean. For this reason, Origin Property trains their sales team and marketing team with Japanese, Chinese and English language to meet these customers' demand.

Target specific group sorted by monthly income level

Origin Property development conducted customer group study by targeting specific consumer groups sorted out by monthly income level. To determine proper price for development properties to facilitate sales level. Origin has set the price as shown below.

Table 1.2 Condominium brand pricing strategy

Condominium Brand		
Brand and Project Type	Monthly Income Level (Baht/month)	Customer Group
Park Origin Natural in the City	60,000 Baht and up	High Level
Knightsbridge English – Elegant Style	45,000 - 60,000 Baht	Upper Mid- High Level
The Origin Live your value	25,000 - 50,000 Baht	Mid-upper -Mid Level
Notting Hill English – Modern Style	35,000 - 45,000 Baht	Mid upper- Mid Level
Kensington English – Charming Style	20,000 - 35,000 Baht	Mid Level

(Source: Origin Annual Report 2020)

Table 1.3 Housing Project Brand

Housing Project Brand		
Brand and Project Type	Monthly Income Level (Baht/month)	Customer Group
Belgravia Premium Detached house	500,000 Baht and up	Upper Level
Grand Britania Semi-Detached house, Detached house	130,000 Baht and up	Upper Mid to High Level
Britania Townhome, Semi-Detached house, Detached house	50,000-130,000 Baht	Mid to Upper Mid Level
Brighton Townhome, Semi-Detached house	30,000-50,000 Baht	Mid Level

(Source: Origin Annual Report 2020)

1.1.5 Origin Core Value for Long-Term Sustainability

Origin Property Public Company Limited adheres to long term sustainable guidelines from SEC for the greater good of environment, society, and corporate governance to further improve their business performance. According to the company's annual report 2020, the company has prepared a sustainability goal to achieve by the end of year 2022 which is in line with Origin's core value; Optimize, Responsive, Innovation, Growth, Integrity, Neat, Service Excellence, Teamwork.

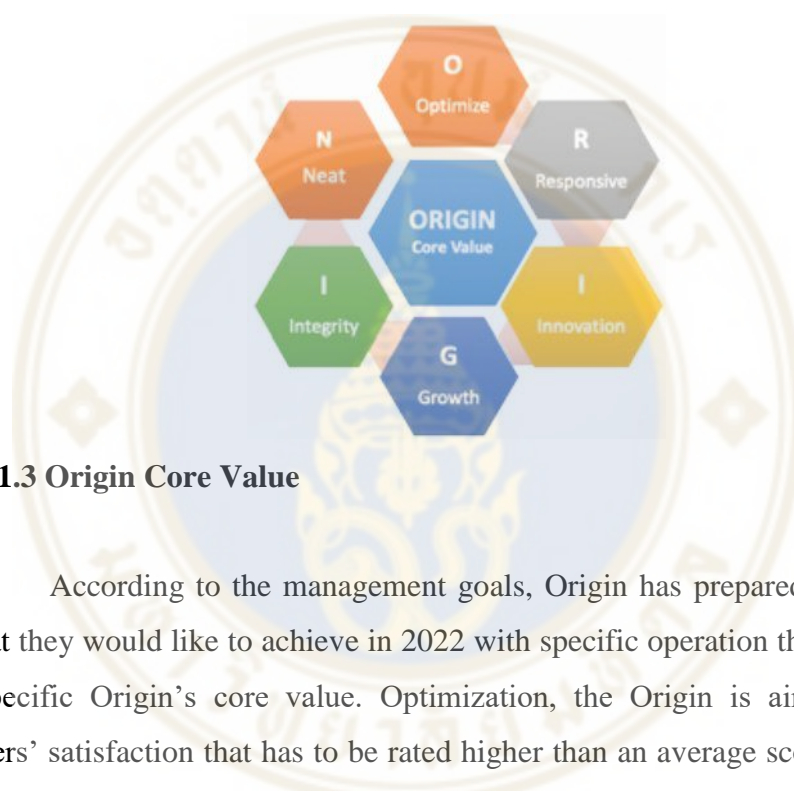


Figure 1.3 Origin Core Value

According to the management goals, Origin has prepared a sustainability goal that they would like to achieve in 2022 with specific operation that is in-line with each specific Origin's core value. Optimization, the Origin is aiming to achieve customers' satisfaction that has to be rated higher than an average score that has been set by the company. In terms of increase in responsiveness, the company monitors and assesses risk in the economy, society and environment to improve its operations once a year in order to be able to deal with the problem fast enough. Innovation, Origin is aiming to develop and implement more of the renewable energy resources to help reduce greenhouse gas emissions by 2022.

Next aspect of Origin's core improvement matrix is its growth, the company is trying to develop their personnel skills by having their employee train no less than 6 hours per person before they can begin their real working task to achieve high working standard. Integrity, every Origin's employee must comply with code of business conduct strictly and the company regulates by monitoring any complaints from Origin's

customers. Neatness, in 2022, Origin's property projects are certified with environmental guidelines and must also consider corporate social responsibility, for example, its condominium and housing design projects must be designed in such a way it reduces energy consumption.

Last 2 aspects are service excellence and teamwork. This can be monitored by increasing in customer satisfaction scoring and receiving less customer complaints and receiving more customers' compliments. And for the teamwork aspect, employee's commitment rate increases every year and leads to lower Origin's employee turnover rate.



CHAPTER II

ORIGIN PROPERTY PCL IN ECOECONOMICS CLIMATE

2.1 Macroeconomic

2.1.1 Thailand GDP

From 25 years back from 2020 as the recorded data from world bank in the picture below. Thailand GDP has slightly grown up in GDP from the pass until 1995 and 1996 with \$3,043 thousand. After 1996 Thailand faced to Thai economic recession in 1997 which made the GDP of the country significantly drop until 1998 Thailand has the lowest value of GDP in 25 years which is \$1,845.829 thousand. All investment in Thailand has significantly drop due to the economic situation, the investor stops investing in Thailand.



Figure 2.1 Thailand's GDP from 1995 to 2021

(Source: Tradingeconomics.com, 2022)

After economic crisis for 4 years in 2001 Thailand could be able to recovery their economic, investors are investing again include foreigner investor which come to

invest in Thailand and makes country GDP has significantly grow from \$1,893 thousand to \$7,817 thousand which growth 313% mainly from industrial investment agricultural export.

After 2019 world has faced with Covid 19 pandemic that makes world economic stuck and effect to world GDP and Thailand GDP which mainly exporting product to overseas.

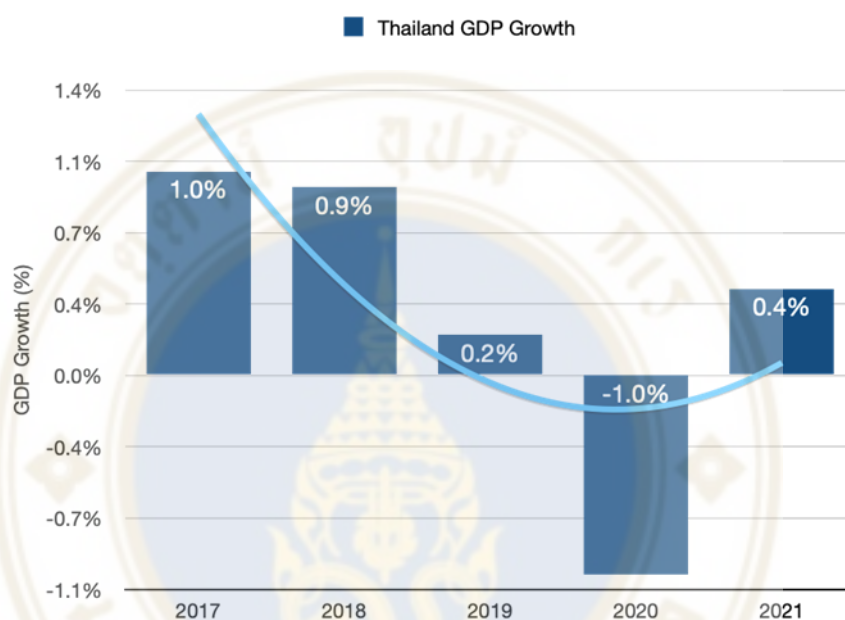


Figure 2.2 Thailand's YoY GDP Growth

(Source: Tradingeconomics.com, 2022)

From the graph above represent year on year Thailand GDP growth from 2017 to 2021.

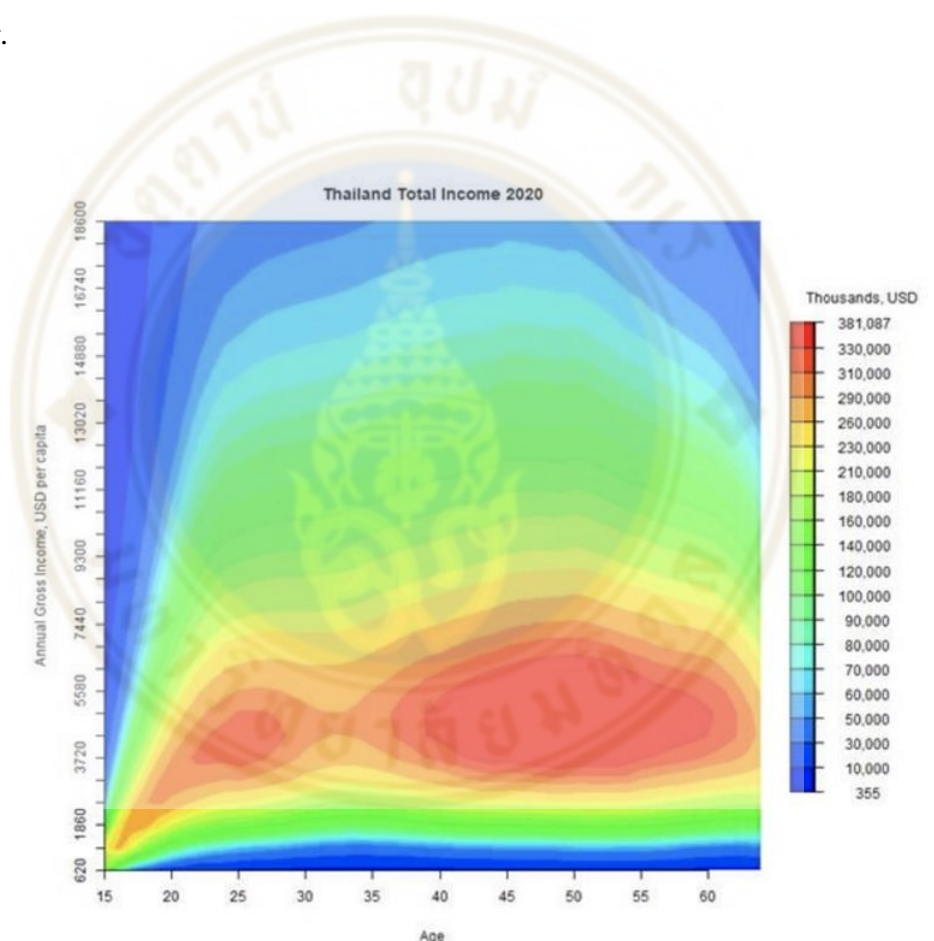
2.1.2 Thailand's Income

Thailand has wide range of income. Regarding to Thailand total income in 2020 from Euro monitor which represented by using color chart to categorize the range of income among the age.

Most of Thai people have gross income per year in the range of \$7500 to \$12,000 among the age of 15 to 60 years. From these data illustrate that Thailand has a high volume of middle-class income regarding to the color chart above. The people that

have the age over 40 years old tend to have high range of income from successful from the jobs and know how to manage their income.

For the source of income from Euromonitor in 2020 in the picture below. Thai people have average gross income about \$4,367 per year. From their gross income almost 60% come from employment, follow with income from investment which around 7.5% and the gross income from benefits is around 6%. From this data shown that most of Thai population has high proportion of gross income from their employment. And the data below also projects gross income of Thai people in 2040 which will be \$7,551 per year.



Source: Euromonitor International from national statistics

Figure 2.3 Thailand's total income 2022

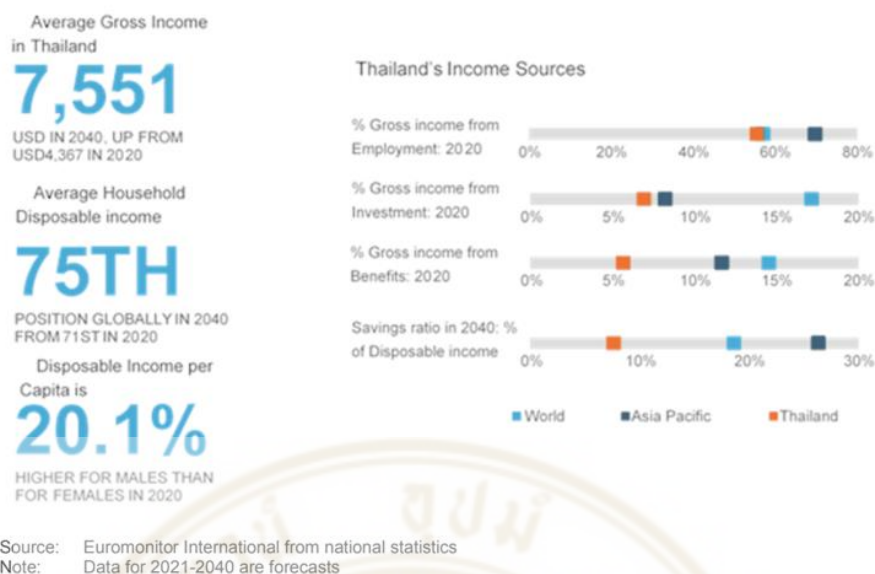


Figure 2.4 Thailand's Income Sources

2.1.3 Thailand Inflation

Regarding to the data from bank of Thailand (BOT) from 2017 to 2021 could see that Thailand doesn't have much increasing index of inflation rate comparing in year on year. In 2017 Thailand has only 0.67% of inflation rate compare with 2016. During pandemic in 2020 Thailand faced with deflation by having -0.85% changed of inflation compared with 2019. And in 2021 Thailand has 1.23% change compared to 2020. Currently in the latest record in March 2022 Thailand has highest inflation rate when compared to the past 13years which is 5.73% change from the same period in 2021 regarding to data from BOT.

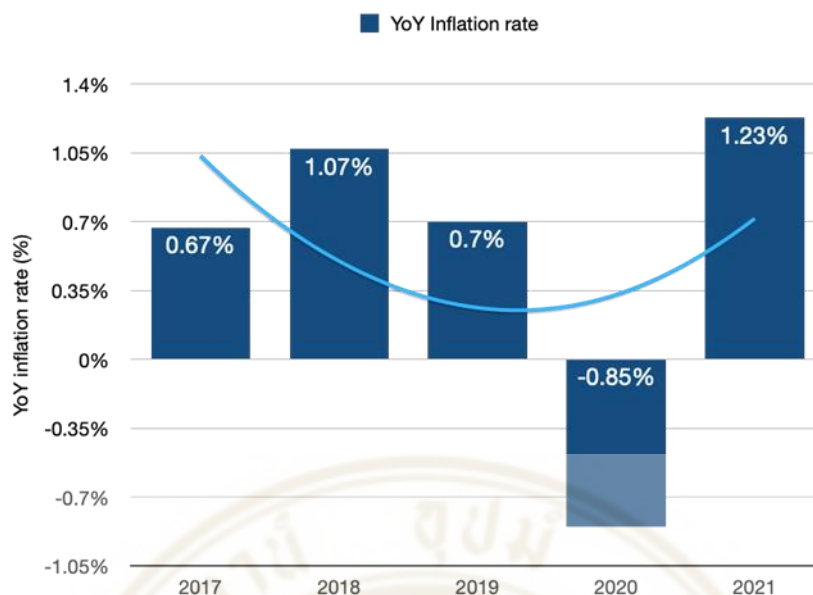


Figure 2.5 YoY Inflation Rate

(Source: Tradingeconomics.com, 2022)

2.1.4 Government Project (train, tolls, EEC)

From 2022 government has project on developing and expanding country's infrastructure which mainly in transportation system by having expanded 5 highways from urban area to rural area starting from 2022, the route will be starting from Bangkok to other part of Thailand which are northeast, western part, south of middle part and 2 shortcut highways between urban area to suburb area near by Bangkok. (Source: www.thebangkokinsight.com)

Another infrastructure is train in Bangkok expanding routes around Bangkok and the suburban area which has many project lines around Bangkok and downtown. From the picture below will see all the trains in Bangkok and projects in the future.



Figure 2.6 Bangkok railway projects list

(Source: efinance.com, 2022)

Government also willing to expand economic area into eastern part of Thailand under the Eastern Economic Corridor project which aim to invite investor to invest in eastern part of Thailand by preparing business facilities that also related to living base and industrial in term of convenience transportation and business opportunity in that area.



Figure 2.7 Economics EEC mapping

(Source: EEC website, 2022)

2.1.5 Industry Analysis

The Thai real estate industry has five different categories which consist of real estate for agricultural, real estate for commercial, real estate for industrial, leisure real estate and residential real estate. For agricultural real estate is the real estate for any agricultural activities which include fields, farm, orchard or any plantation area, commercial real estate is for office building, shopping mall hotels, fresh markets, convention centers, commercial buildings, real estate for industrial are plants for factory or industrial estate, leisure real estate are resort or hotel for vacation purpose only, lastly is residential real estate which consist of condominium, house, and apartment

From the table shows listed company in Thailand under property sector in SET index, there are 18 companies in total, the highest market capitalization is Land and House company with 114.7 billion baht, Land and House is the company which has wide base in Thailand which mainly provide residential product in low rise, high rise, financial business under brand LH bank also construction firm, for the lowest market capitalization company is Asset Wise company with 0.78 billion baht, Asset Wise is new comer company in the industry which mainly provide low rise resident.

Table 2.1 Listed Company in SET

Company	Market cap. (Billion baht)
Land and House	114.717
Supalai	43.249
AP	33.347
Frasers property	32.47
Pruksa	31.74
Origin	29.434
Q house	24.643
Sansiri	18.457
SC asset	16.628
Singha Estate	13.296
Sena	7.467
L.P.N. Development	6.777
Ananda	6.166
Property perfect	5.149
All Inspire development	1.729
Major Development	1.618
Noble	1.611
Asset Wise	0.783

(Source: Terrabkk.com, Yahoo Finance.2022)

After seeing overall market from property sector in SET index the pie chart below will show the proportion of the market could see that 32% of total market capitalization value come from Land and House company follow with Supalai 12% and AP, Pruksa, Fraser has 9% and our target company Origin hold 8% from from overall market capitalization. From the proportion of the market capitalization Land and household wider proportion when compare with the competitor in the industry due to the product line and of Land and House company specially the recurring in from LH bank.

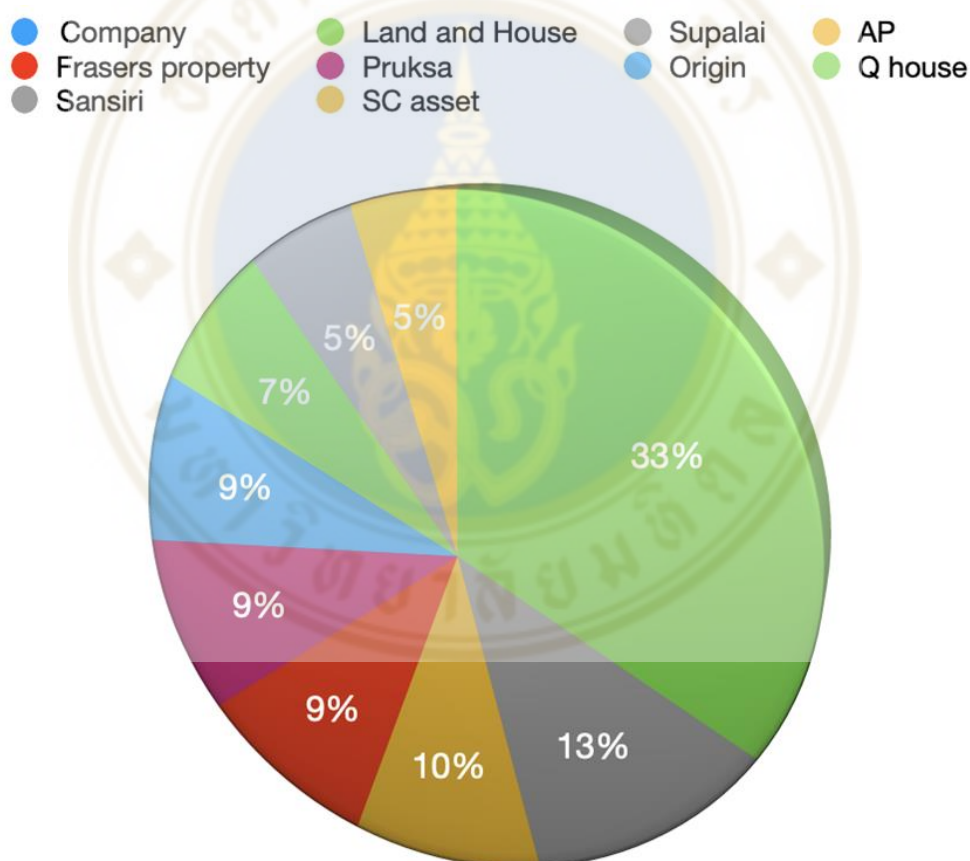


Figure 2.8 Top 10 properties company market capitalization)

(Source: Terrabkk.com)

CHAPTER III

HOW MUCH IS ORIGIN PROPERTY PCL WORTH?

3.1 Financial Health Diagnostic

Profit or Loss (in Thousand Baht) ORIGIN PROPERTY	2015	2016	2017	2018	2019	2020	2021	CAGR
Revenue:								
Revenues from sales of real estate	2,010,100.00	3,153,068.47	8,764,850.60	14,523,121.24	12,278,599.66	9,870,483.01	13,623,385.59	37.57%
Revenues growth (%)		56.86%	177.98%	65.70%	-15.45%	-19.61%	38.02%	
Dividend Income	-	-	-	-	250.00	-	-	
Other income	44,983.60	45,976.28	1,222,870.26	2,114,712.01	1,843,272.63	1,243,649.96	2,319,579.23	
Total Revenue	2,055,083.17	3,199,044.74	9,987,720.86	16,637,833.25	14,122,122.14	11,114,132.77	15,942,965.20	40.70%
Expenses:								
Cost of real estate sales	1,148,764.27	1,724,158.02	5,662,437.33	8,610,999.33	6,934,189.57	6,307,785.06	9,018,394.27	
Selling expenses	293,517.37	507,945.06	1,179,181.45	2,446,535.06	2,167,178.29	1,319,710.81	1,602,803.30	
Administrative expenses	110,774.93	158,471.85	273,299.79	425,105.838	520,091.71	502,512.72	741,286.44	
Total expenses	1,553,056.56	2,390,574.93	7,114,918.57	11,482,640.22	9,621,459.57	8,130,008.59	11,362,484.01	
Profit before finance cost and income tax expenses	502,026.60	808,469.82	2,654,336.94	4,618,832.96	4,261,684.76	2,984,124.38	4,580,480.81	
Finance cost	- 17,233.19	- 6,786.83	- 50,986.07	- 262,470.19	- 272,785.07	- 263,455.55	- 296,707.53	
Profit before income tax expenses (EBIT)	484,793.42	801,682.99	2,603,350.88	4,356,362.77	3,988,899.68	3,324,779.99	4,242,111.56	43.55%
EBIT (%) increase/decrease		65.37%	224.74%	67.34%	-8.44%	-16.65%	27.59%	
Income tax expenses	- 98,313.34	- 162,088.55	-582,942.78	- 980,608.60	- 848,192.47	- 560,400.69	- 865,019.49	
Profit for the year	386,480.08	639,594.44	2,020,408.10	3,375,754.17	3,140,707.21	2,764,379.30	3,377,092.07	

(Source: Origin Property PCL yearly financial statement from 2015-2021 with CAGR)

Origin Property PCL's financial statement from year 2015 to 2021 has been prepared for this valuation report. Revenue of the company has been divided and consolidated into 3 subcategories. Revenue from sales of real estate, dividend income and other income. Revenue from management of properties has been consolidated into other income category in the table.

The company annual growth rate and compound annual growth rate (CAGR) has been calculated under the tab 'revenue growth (%)' shown in green and red highlight. Most of Origin Property PCL's revenue comes from sales of real estate so we first analyze the company's overall financial health well-being, the results are shown above. We can see the pattern that the revenue had grown from 2016 to 2018 before a slight decline in 2019 to 2020 due to COVID-19 Pandemic. The same trend applies to company's EBIT in 2019 and 2020. However, Origin Property PCL's earning increased again in year 2021.

COVID-19 pandemic was first announced in the end of 2019, around October in Wuhan city, China. This led to Thailand having a national wide lock down and country was closed out from the tourist in April 2020. A lot of investors had a negative outlook and lost their trust in Thailand's economy at that time, this led to many

jobs lay off. Many households may lack confidence in investing in real estate in year 2019 to 2020 due to an economics uncertainty. After 2 years have been passed, most of Thai people learned to live with COVID-19 regulations for instance, work from home regulation, social distancing, limiting population in confined space and many more. This finally results in 38.02% of revenue from sales of real estate growth.

Compound annual growth rate of EBIT from 2015 to 2021 has been calculated and come out to be 43.55%, including an initial effect of COVID-19 pandemic in 2019 to 2020. Overall, Origin Property PCL's EBIT outlook seems to be very positive despite a slight decline in 2019 to 2020. We believe Origin Property PCL will be able to adjust and manage their sales performance in the future to come. In this discounted cash flow valuation method will be used in combination with relative valuation method to find out the value of the company. Should we invest in this company at all?

3.2 Discounted Cash Flow Valuation

3.2.1 Introduction to Discounted Cash Flow Valuation Method

In this section of valuation method, Discounted Cash Flow (DCF) method will be used to estimate the value of ORIGIN. In this method, we will estimate company's expected future cash flow and discounted to today's value. In DCF analysis for ORIGIN, we need to work step-by-step to understand how much ORIGIN is worth today. As the name suggest, DCF or discounted cash flow requires us to work with discount rate, typically called 'weight average cost of capital' or WACC for short to find terminal value of the company at the end of period.

DCF method, in contrast with multiple method for valuation, allows an analyst to create and 'tweak' the data to create multiple scenarios as needed for the best estimation of the value of the company. Analyst can edit revenue trends, cost trends in the future to model their cash flow in each period to estimate terminal value to their own expectations of the market, therefore there is no right or wrong using discounted cash flow method. However, the accuracy of DCF method of valuation greatly relies on analyst's experience in particular industry to give them a good 'feel' in the industry. In

this valuation report, I will attempt to use discounted cash flow method to conduct valuation analysis on Origin Property company Ltd.

AN OVERVIEW OF THE DISCOUNTED CASH FLOW ANALYSIS

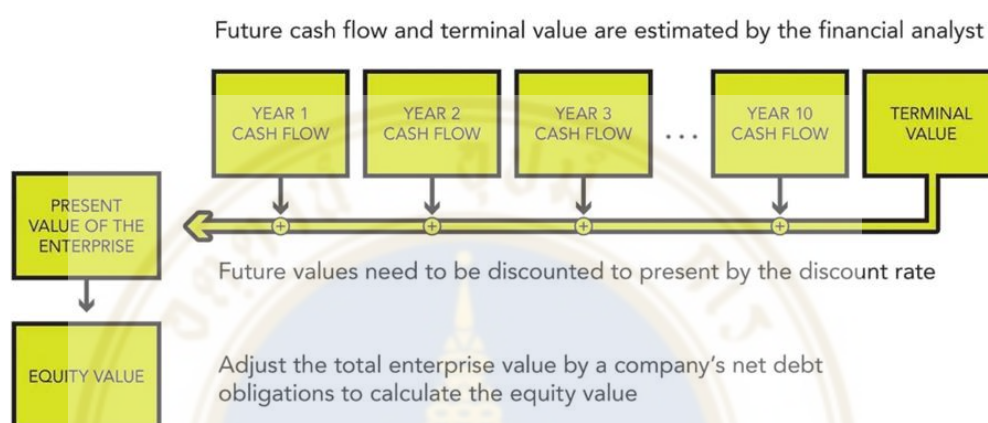


Figure 3.1 An Overview of the discounted cash flow analysis

(Source: clydebankmedia.com)

Figure 3.1 shows a simplified overview graphic of the process to arrive at equity value of Origin. Firstly, we need to construct cash flow analysis for Origin for past period to the concerned future period using our estimate growth for the industry. In this part, I will use data from multiple sources to compile and see what can affect revenue of real estate business of Origin property, including macroeconomic factors and COVID-19 pandemic toward real estate trends as well. Therefore, the most crucial steps are to gather accurate financial data and the trends around the company to predict the revenue trends. All these data later will be used to calculate free cash flow to company to measure value of the company.

According to Figure 3.1, we need to estimate company's free cash flow to firm (FCFF) first. Yearly free cash flow to firm can be done by starting with earnings before interests (EBIT) and taxes, minus taxes on EBIT. This will yield net operating profit after taxes (NOPAT), then add depreciation and amortization if any. Then add

change in net working capital minus investment in capital expenditures (CAPEX) and long-term investments. This will result in total yearly free cash flow to firm.

After FCFF has been calculated for both past period and future period of concern, we need to calculate terminal value (TV) of our FCFF. Terminal value is the estimate value of our company beyond our forecasted period, where typical forecasted period is somewhere between 3-5 years, but the length of forecast period is dependent on the nature of an industry as well. For real estate industry, I will use 3-5 years for the most accurate estimation, but for some industry like oil and gas business with more predictable demand, we can forecast even further away into the future. To calculate terminal value, we can choose between 2 methods that are popular in an industry. Perpetual growth method or exit multiple method. In this report, perpetual growth method will be used to find terminal value, as it assumes that the company will continue to generate cash flow as it has been estimated forever.

$$\text{Terminal Value} = FCFF_f(1 + \text{growth}) / (\text{WACC} - \text{growth})$$

Where:

- FCFF_f is free cash flow at the final year of the period
- Growth is perpetual growth rate of free cash flow to firm (FCFF)
- WACC is weight average cost of capital, as discounted rate

After terminal value has been calculated, we need to find Origin's net present value by discounted to present value (PV), this can be done by using NPV function in Microsoft Excel. This will yield net present value or in this case, enterprise value (EV). To arrive at total value of firm, we must add the value of cash and non-operating assets. Debt of the firm then can be subtracted out from total value of firm to arrive at company's value of equity. Which will be the end of valuation processes of Origin property development.

3.2.2 Capital Asset Pricing Model (CAPM)

Calculating weighted average cost of capital (WACC) requires cost of equity (r_e) in their mathematical component. Capital Asset Pricing Model (CAPM) describes the systematic risk and expected return. Weight average cost of capital can be separated into 2 components, cost of debt (r_d) and cost of equity (r_e). Cost of equity is

an investors' expected return, considering the risk that comes with the company's specific risk. This can be described using beta component in capital asset pricing model.

$$\text{Capital Asset Pricing Model: } E(r_e) = r_f + b (R_m - R_f)$$

Where, r_f is risk-free rate (10-year government bond yield). Beta (b) or beta coefficient can be calculate using line of best fit between ORI stock return and stock exchange of Thailand (SET)'s return using linear regression. But in this calculation, finished data for ORI's beta coefficient will come from SET.or.th. Lastly, the difference between return of the market (R_m) and risk-free rate (R_f) or known as market risk premium can be found from Damodaran's stern.nyu.com.

First, risk-free rate can be identified using 10-year government bond yield in Thailand. In theory, investor expected risk-free rate to have zero risk or the risk that is minimized. In this case we use Thailand 10-year government bond yield to find risk-free rate. Thailand 10-year government bond yield can be found in thaibma.or.th. (See **Figure 3.2**) In this case, dragging our cursor on TTM 10.00 years (TTM is time to maturity), we can identify that risk-free rate (r_f) is 2.15%.

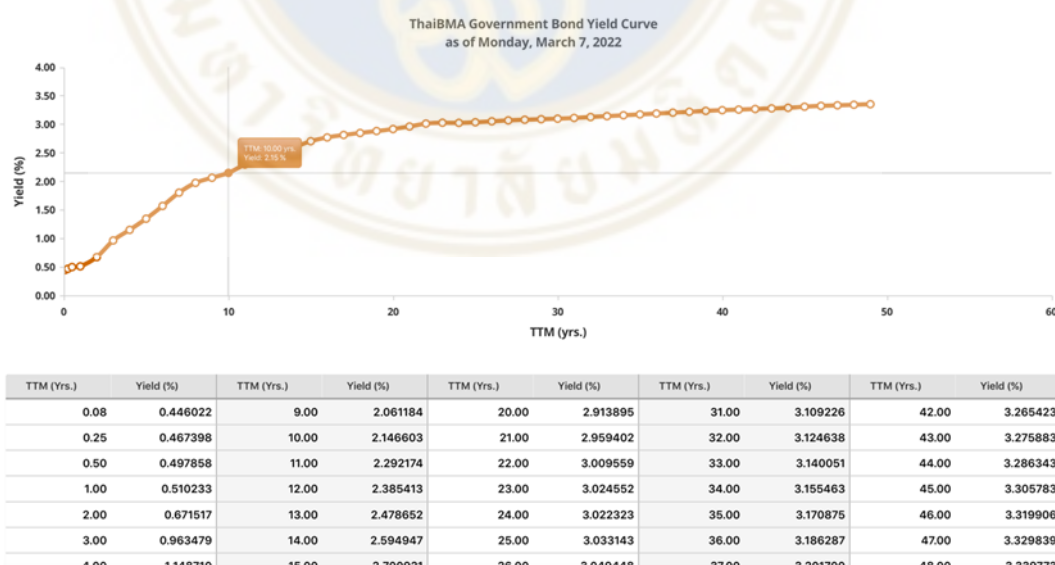


Figure 3.2 ThaiBMA Government Bond Yield Curve as of Monday, March 7, 2022.
(Source: ThaiBMA, 2022)

Second, beta coefficient can be found in Stock Exchange Thailand's website. (See Figure 3.3) According to data from Figure 3.3, beta equals to 1.20.

Statistics	YTD	2021	2020
	04 Mar 2022	30 Dec 2021	30 Dec 2020
Listed share (M.)	2,452.86	2,452.86	2,452.86
Market Cap (MB.)	29,434.35	27,717.35	18,519.11
Price (B./share)	12.00	11.30	7.55
BVPS (B./Share)	5.10	5.10	4.47
P/BV (X)	2.35	2.22	1.69
P/E (X)	9.22	9.15	6.38
Turnover Ratio (%)	20.62	160.94	120.90
Value Trade/Day (MB.)	138.57	148.23	73.51
Beta	1.20	1.09	1.20

Figure 3.3 ORI's beta coefficient

(Source: SET Index, 2022)

Lastly, in our calculation of return on equity (r_e) using capital asset pricing model (CAPM) we need to find equity risk premium. We can obtain equity risk premium (ERP) from professor Damodaran's portal. (Source: <https://pages.stern.nyu.edu/>)

Table 3.1 Damodaran's Portal Equity Risk Premium table compared with CLMV

Country	Moody's rating	Adjusted Default Spread	Country Risk Premium	Equity Risk Premium
Thailand	Baa1	1.36%	1.58%	5.82%
Cambodia	B2	4.68%	5.44%	9.68%
Laos	Caa2	7.66%	8.90%	13.14%
Myanmar	NR	10.21%	11.87%	16.11%
Vietnam	Ba3	3.06%	3.56%	7.80%

(Source: Damodaran, 2022)

According to Damodaran, Thailand's equity risk premium ($R_m - R_f$) equals to 1.58%. Comparing to neighbors, Thailand has the lowest equity risk premium rate (ERP). It is the excess return that investors are expecting over risk-free rate.

According to capital asset pricing model, we now can calculate return on equity which will be used to later calculate weighted average cost of capital (WACC). The formula that will be used are as mentioned earlier.

$$\text{Capital Asset Pricing Model: } E(r_e) = r_f + b (R_m - R_f)$$

Table 3.2 Return on equity calculation table (CAPM)

Variables		Data Source
Risk-Free rate (rf)	2.15%	ThaiBMA, 10-yr Thai gov bond yield (07 Mar 2022)
ORI's beta (b)	1.2	Stock Exchange Thailand (SET)
Equity Risk Premium	5.82%	Damodaran's portal, New York University 2022
Return on equity (re)	9.13%	$E(re) = r_f + b (R_m - R_f)$

(Source: Own calculation using capital asset pricing model equation)

3.2.3 Discounted Rate Using Weighted Average Cost of Capital (WACC)

WACC or Weighted average cost of capital is the minimum return that investors required. WACC consists of 2 parts. Debt portion and equity portion, since it is 2 primary methods company raise its funds. Weighted average cost of capital formula can be expressed as follow:

Weighted Average Cost of Capital (WACC as discounted rate)

$$WACC = W_d \times R_d (1-T) + W_e \times R_e + W_p \times R_p \text{ (if company has preferred stocks)}$$

W_d or weighted of debt represents the weight proportion that company raises its funds through debts such as bonds and bank loans from financial institutions. And another way company can raise its finance would be from company's equity. Usually raising funds from debt is less expensive than from equity. Weight of debt (W_d) and weight of equity (W_e) and Weight of prefer stock (if any) must added up to 1.0 or 100% since we are looking at whole proportion of financing. Lastly, T is corporate income tax rate which is 20% in Thailand for company that is listed in Stock Exchange of Thailand (SET). (Source: rd.go.th)

To determine the cost of debt (R_d) of Origin Property, credit spread method will be used. The credit spread method is as follow:

$$\text{Cost of Debt } (R_d) = \text{risk-free rate } (r_f) + \text{credit spread}$$

$$\text{After Tax cost of Debt } (R_d) = (\text{risk-free rate } (r_f) + \text{credit spread}) \times (1-T)$$

Risk-free rate will be equal to Thailand 10-yr government bond yield from ThaiBMA websites, and it is equal to 2.15% as of March 7th,2022. And credit spread can be obtained from TRIS. Also in Origin Property's website, under investor relation tab, company credit rating has been posted and ready to download for full support and its rationale from TRIS rating. Currently Origin property credit rating is standing at BBB with positive overview. (Source: investor.origin.co.th)

TRIS RATING
A Strategic Partner of S&P Global

CreditNews ข่าวเครดิต

บริษัท ออร์จิน พร็อพเพอร์ตี้ จำกัด (มหาชน)

ครั้งที่ 70/2564
30 เมษายน 2564

CORPORATES

อันดับเครดิตองค์กร: **BBB**
แนวโน้มอันดับเครดิต: **Positive**

วันที่ทบทวนล่าสุด: 29/04/63

วันที่	อันดับ	แนวโน้มอันดับ
	เครดิต	เครดิต/ เกรดดี
05/04/62	BBB	Stable
03/08/61	BBB-	Positive
29/09/60	BBB-	Stable
23/05/60	BBB-	Alert Developing
12/09/59	BBB-	Stable

เหตุผล

ทริสเรตติ้งอันดับเครดิตองค์กรของ บริษัท ออร์จิน พร็อพเพอร์ตี้ จำกัด (มหาชน) ที่ระดับ "BBB" ในขณะเดียวกัน ทริสเรตติ้งยังปรับแนวโน้มอันดับเครดิตของบริษัทเป็น "Positive" หรือ "บวก" จาก "Stable" หรือ "คงที่" ด้วย แนวโน้มอันดับเครดิตที่ปรับขึ้นสะท้อนถึงสถานะทางการตลาดของบริษัทที่ดีขึ้นอย่างต่อเนื่อง อีกทั้งคาดว่าบริษัทจะมีผลการดำเนินงานที่แข็งแกร่งและสามารถรักษาอัตราส่วนเงินกู้รวมต่อโครงสร้างเงินทุนให้อยู่ในระดับต่ำกว่า 60% ได้อย่างต่อเนื่อง

อันดับเครดิตยังพิจารณาถึงความสามารถในการทำกำไรที่สูงกว่าค่าเฉลี่ยในอุตสาหกรรมเดียวกัน ภาระหนี้ของบริษัทที่ค่อนข้างสูงจากการขยายธุรกิจอย่างรวดเร็วทั้งในการพัฒนาที่อยู่อาศัยและการพัฒนาอสังหาริมทรัพย์เพื่อการพาณิชย์ และการแพร่ระบาดที่ยืดเยื้อของโรคติดเชื้อไวรัสโคโรนา 2019 หรือโรคโควิด 19 (COVID-19) ซึ่งจะยิ่งเพิ่มความกดดันแก่อุปสงค์ที่อยู่อาศัยที่ซบเซาอีกด้วย

ประเด็นสำคัญที่กำหนดอันดับเครดิต

ความสามารถในการแข่งขันปรับตัวเพิ่มขึ้นทั้งคอนโดมิเนียมและโครงการบ้านจัดสรร

ทริสเรตติ้งมองว่าความสามารถในการแข่งขันของบริษัทในตลาดคอนโดมิเนียมและโครงการบ้าน

Figure 3.4 Identifying Origin property's bond rating via TRIS RATING

(Source: investor.origin.co.th, 2022)

Now that Origin property's credit rating has been identified, interpretation to basis point is needed. Corporate bond yield curve as an averaged spread can be found in ThaiBMA website under bond market data, yield curve for corporate bond yield curve

tab. An average spread for BBB-rating is 335.336801 bp (basis point, 100 bp equals to 1%), so in this case, the credit spread is 3.35%. (See Figure 3.5)

Yield Curve		Corporate Bond Yield Curve (Averaged Spread)					
Government Bond Yield Curve		Corporate Bond Yield Curve (Based on TTM) as of 07 March 2022					
Zero Coupon Yield Curve							
Corporate Bond Yield Curve							
US Treasury							
SOE Spread Matrix							
Indicative Intraday Yield Curve							
Bond Quotation							
Bond Index							
Non-resident Flows							
Statistics & Reports							
Thai MA Rating							
Group	Averaged Spread (bp)			Standard Deviation (bp)			
	<= 3 Yrs.	3 - 5 Yrs.	> 5 Yrs.	<= 3 Yrs.	3 - 5 Yrs.	> 5 Yrs.	
AAA	36.568811	65.576876	83.766168	16.342566	23.998102	46.632851	
AA+	49.579698	63.493734	77.326022	36.173251	8.072047	9.492813	
AA	93.502773	82.222212	103.509111	104.728519	12.171926	18.612917	
AA-	57.151492	103.825902	151.520486	34.932048	31.470668	16.685097	
A+	61.459092	110.363213	151.361609	32.632329	33.834820	19.220457	
A	90.065933	134.729108	192.751448	59.489157	47.139154	68.251544	
A-	93.700845	147.051959	168.906148	40.547546	34.326199	37.715593	
BBB+	226.707130	264.186238	287.787221	37.841551	34.978328	34.806740	
BBB	336.971613	335.336801	-	66.982774	54.657804	-	
BBB-	421.728734	-	-	39.732114	-	-	

Figure 3.5 Credit Spread rating from ThaiBMA expressed in basis point

(Source: ThaiBMA, 2022)

According to the formula, cost of debt and after-tax cost of debt can now be identified using formula below:

$$\text{Cost of Debt } (R_d) = \text{risk-free rate } (r_f) + \text{credit spread}$$

$$\text{After Tax cost of Debt } (R_d) = (\text{risk-free rate } (r_f) + \text{credit spread}) \times (1-T)$$

Table 3.3 Calculation of after-tax cost of debt using risk-free plus credit spread

Variables		Data Source
Risk-free rate (rf)	2.15%	ThaiBMA, 10-yr Thai gov bond yield (07 Mar 2022)
BBB-rating credit spread (%)	3.35%	TRIS rating
Cost of debt (Rd)	5.50%	Rd = risk-free rate + credit spread
Corporate Tax	20.00%	Thailand corporate income tax, (rd.go/th).
After-tax cost of debt (Rd) x (1-T)	4.40%	Own calculation

(Source: Own calculation, 2022)

Weight of debt and weight of equity need to be identified before calculation of weight average cost of capital (WACC) calculation. The weight proportion between debt and equity was determined by the sum of interest-bearing debt from fourth quarter of 2021's balance sheet. And the weight of equity was calculated by total shares outstanding multiply with current price in the market. Debt portion of the company is equal to 27.61% with equity of 72.39%.

Table 3.4 Weighted average cost of capital calculation

We & We	Value (in Thousand Baht)	Note
Interest bearing debt	10,383,610.00	Financial statement 2021
Equity Value	27,226,773.23	Note 21,21,25
Total Value	37,610,383.23	Note 44 : Capital Management
We (%)	72.39%	
Wd (%)	27.61%	
<u>Total</u>	<u>100.00%</u>	

Calculation of WACC (Target)	
Weight of debt	27.61%
Weight of equity	72.39%
After Tax Cost of Debt tax rate	4.40% 20%
Cost of equity using CAPM	
Risk free rate (ThaiBMA 10-yr gov bond yld as of March 07 20)	2.15%
Beta	1.20
Market risk premium (Damodaran Stern, NYU) (Rf - Rm)	5.82%
Cost of equity, $Re = Rf + b \times (Rf - Rm)$	9.13%
WACC	7.83%
Growth rate (Range : GDP Growth and Inflation Rate)	2.00%

(Source: Own calculation, 2022)

3.2.4 Determination of Perpetual Growth Rate (g) for Origin Property PCL.

According to ceicdata.com (ceicdata.com, 2022), the data were consolidated and processed by Bank of Thailand. YoY growth data shows that house prices in Thailand grow at the rate of 5.8%. However, the rate of growth is an average from year 2009 until 2021, therefore the time span that has been considered is quite large. Taking COVID-19 situation into account, the rate of growth of 5.8% is quite high. To be more realistic and conservative about the market, we have decided to use 2.0% for our perpetual growth rate. We also found another source of trustable research from KBank's real estate market researcher, they forecasted the housing growth rate of the market to be around 1.8 to 7.3%, the K-research article also pointed out that Thailand's real estate industry is heavily dependent on COVID-19 waves (Kasikornresearch, 2022). In conclusion, we decided to use perpetual growth rate at 2.00% for Discounted Cash Flow valuation. We believe that 2.00% of perpetual growth rate is considered conservative but also is possible for the market to grow at this rate.

3.2.5 Discounted Cash Flow Modelling (DCF Valuation)

Table 3.5 DCF Model and estimate share value in Thai Baht per share

(Number in thousands, THB)	2021 (Previous Year)	2022F	2023F	2024F	2025F	2026F
EBIT	4,580,480.81	4,672,090.43	4,765,532.24	4,860,842.88	4,958,059.74	5,057,220.94
Less: Taxes on EBIT	916,096.16	934,418.09	953,106.45	972,168.58	991,611.95	1,011,444.19
NOPAT (Net Operating profit after taxes)	3,664,384.65	3,737,672.34	3,812,425.79	3,888,674.31	3,966,447.79	4,045,776.75
Add: Depreciation	182,602.82	184,000.00	185,000.00	196,000.00	200,680.70	205,473.18
Add/Minus: Change in Net working capital (AR + Inv. - AP)	1,250,000.00	1,275,875.00	1,302,285.61	1,329,242.92	1,356,758.25	1,384,843.15
Add/Minus: Capital Expenditure	(46,397.19)	(47,325.13)	(48,271.63)	(49,237.06)	(50,221.81)	(51,226.24)
Free cash flow to firm (FCFF)	2,550,590.28	2,598,472.21	2,646,868.55	2,706,194.32	2,760,148.43	2,815,180.54
Terminal value of firm (TV)						49,278,774.23
Summary of cash flow	2,550,590.28	2,598,472.21	2,646,868.55	2,706,194.32	2,760,148.43	52,093,954.77
Enterprise Value (EV or NPV)	43,752,505.48					
Add: Cash and non-op assets	1,966,000.00			Value of equity (THB)	33,907,505,477.15	
Total value of firm in Present	45,718,505.48			# Share Outstanding	2,452,862,453	
less: Value of Debt	11,811,000.00					
Value of equity	33,907,505.48					
Estimate share value (in Thai Baht)	13.82					

(Source: Own's calculation, 2022)

After we have defined our terminal growth rate at 2.0%, we took EBIT of year 2021 as can be seen from Table 3.5 then we projected EBIT's forecast at 2.0% growth per year. This terminal growth assumption is within the range of inflation rate of Thailand and GDP growth rate. For taxes on EBIT, it will be a corporate tax rate of Thailand which will be 20% on EBIT. In term of depreciation of the assets, we used Thomson Reuter's existing forecasted number to input into our DCF model. As the company invests in more of condominium and housing, the depreciation of assets increases every year. We calculated the CAGR of depreciation rates to be at 2.40%, which is closed to terminal growth rate. Most of EBIT of ORIGIN comes from the sales of tangible assets such as housing and condominiums so we approximate that depreciation rate would increase in the same rate of its sales of housing and condominium as well.

For change in networking capital, we add account receivables with inventories and minus with account payable. We calculated the projection of change in networking capital by finding 2021's networking capital first, which comes out to be 24.39 million THB. Then we calculated the ratio between sales to networking capital of 2021 and used that ratio to project the growth in change in networking capital. And for Capital Expenditure (CAPEX), we projected the growth with the same rate of EBIT since most of the companies' revenue comes from the sales of their assets. We estimate CAPEX with the 2.00% growth rate and the results are shown in table 2022. The more ORIGIN invests into their project to sale, the more increases in CAPEX in the future horizon.

In conclusion, the forecasted estimate share value in Thai Baht per share is 13.82 under current assumptions. And for the 2023F share price will be at 14.48 Baht per share.

3.2.6 Sensitivity Analysis under multiple circumstances

In sensitivity analysis, we could calculate ORI's share price in multiple circumstances for instance, difference in weighted average cost of capital and growth. In this DCF model, we assumed that the growth will be at conservative rate of 2.50% until the end of forecasted period. The result of the share price is 13.25 Baht per share. But to aid our decision making, if the terminal growth rate equals to 2.00%, the share price of ORI will still be 11.65 Baht per share which will result in higher price than current share price as of the date of calculation (Apr 27th, 2022).

This analysis also can provide theoretical share price if there are any changes to corporate structure, risk-free rate (which currently is very volatile), and terminal growth rate. Our sensitivity analysis should answer any questions regards to changes in risk-free rate and market risk premium.

Table 3.6 ORI's share price sensitivity analysis

		Terminal Growth Rate (%)							
Share Price: 13.26 Baht / Share		1.00%	1.50%	2.00%	2.50%	3.00%	3.50%	4.00%	4.50%
WACC (%)	2.83%	51.65	73.36	121.23	314.15				
	3.83%	32.00	40.16	52.79	74.90	123.67	320.19		
	4.83%	22.61	26.91	32.72	41.02	53.86	76.36	125.97	325.90
	5.83%	17.11	19.77	23.13	27.49	33.39	41.83	54.88	77.74
	6.83%	13.50	15.31	17.51	20.21	23.61	28.04	34.03	42.60
	7.83%	10.94	12.26	13.81	15.66	17.88	20.62	24.07	28.56
	8.08%	10.41	11.65	13.08	14.77	16.80	19.27	22.34	26.28
	9.83%	7.56	8.36	9.26	10.28	11.46	12.81	14.40	16.29
	10.83%	6.39	7.04	7.76	8.56	9.47	10.51	11.69	13.07

(Source: Own calculation, 2022)

Another point we would like to add into our sensitivity analysis stemmed from the question about the volatility of risk-free rate. Since risk-free rate in Thailand changes so much in the past, so we decided to try to check the share price if we decided to change our risk-free rate to 2.50%. But for the disclaimer, we still insist that we should use current risk-free rate and not 10 years average due to declining trend of risk-free rate. This sensitivity analysis check is only for experimental purpose on share price.

Table 3.7 Sensitivity analysis if risk-free rate is 2.50% (past Thailand rf 10-yr average)

		Terminal Growth Rate (%)							
		1.00%	1.50%	2.00%	2.50%	3.00%	3.50%	4.00%	4.50%
WACC (%)	Share Price: 13.26 Baht / Share								
	2.83%	51.65	73.36	121.23	314.15				
	3.83%	32.00	40.16	52.79	74.90	123.67	320.19		
	4.83%	22.61	26.91	32.72	41.02	53.86	76.36	125.97	325.90
	5.83%	17.11	19.77	23.13	27.49	33.39	41.83	54.88	77.74
	6.83%	13.50	15.31	17.51	20.21	23.61	28.04	34.03	42.60
	7.83%	10.94	12.26	13.81	15.66	17.88	20.62	24.07	28.56
	8.08%	10.41	11.65	13.08	14.77	16.80	19.27	22.34	26.28
	9.83%	7.56	8.36	9.26	10.28	11.46	12.81	14.40	16.29
	10.83%	6.39	7.04	7.76	8.56	9.47	10.51	11.69	13.07

(Source: Own calculation, 2022)



CHAPTER IV

VALUATION CONCLUSION

After the processes of discounted cash flow valuation and relative valuation, we have finally arrived at 2 target prices. The target price for DCF method of valuation is 13.82 Baht per share by the end of 2022. For relative valuation, we have the target price set at 11.84 Baht. This valuation method all agreed upon one consensus, which is the current price of ORI is undervalued (about 11.10 Baht per share as of Apr 27th, 2022) at the time of this report. Once we have obtained our target price of 2022, we checked with institution investment analyst from K-bank securities and KTBST securities, both analysts agreed upon the same direction of ORI's stock price, that it is currently undervalued compared to target price.

We decided to find average between our target prices and institution researchers and the result yielded value of 13.52 Baht per share by the end of 2022. For this reason, under the same consensus, we recommend buying share of ORIGIN PROPERTY PCL (SET: ORI).

Table 4.1 Target Price summary

Valuation Analysis (SET:ORI)	Target Price of 2022 (Baht/Share)	Responsible Analyst and Institutions
Discounted Cash Flow Valuation (DCF)	13.82	Suthipoj Rugtrakul, Corporate Finance, CMMU 2022.
Relative Valuation	11.84	Teerarat Sarakwan, Corporate Finance, CMMU 2022.
Sum-of-the-part method and Relative	13.40	Sorapong Jakteerungkul, Kasikorn Securities. (March 2022)
Relative Valuation (on 2021 and 2022E)	15.00	Amnart Ngosawang, KTBST Securities (December 2021)
Average Price Consensus	13.52	
Current Market Price on date of defence	To be update (May 01st 2022)	Thailand Stock Exchange

(Source: Own calculation, 2022)

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