

**DISCOUNTED CASH FLOW OF KCE ELECTRONICS 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
2022**

COPYRIGHT OF MAHIDOL UNIVERSITY

Thematic paper
entitled
**DISCOUNTED CASH FLOW OF KCE ELECTRONICS PUBLIC
COMPANY LIMITED**

was submitted to the College of Management, Mahidol University
for the degree of Master of Management
on
May 1, 2022



.....
Mr. Vimphan Moungnual
Candidate

.....
Asst. Prof. Simon Zaby,
Ph.D.
Advisor

.....
Prof. Roy Kouwenberg,
Ph.D., CFA
Chairperson

.....
Assoc. Prof. Vichita Ractham,
Ph.D.
Dean
College of Management
Mahidol University

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

ACKNOWLEDGEMENTS

First, here I would like to express my sincere gratitude to this thematic paper advisor, Dr. Simon Zaby. His advice on the project was open discussions rather than one-sided comments. Active communication between Dr. Simon and our team was a critical factor which led us to the final stage. Our project couldn't have gone smoothly without his practical advice and meaningful discussions.

It was a great opportunity for me to work with Mr.Charong Wongcharee, who my teammate. He has always been proactive in preparing required information in advance. His ability and effort support a lot for preparing this thematic paper. It would be more difficult to reach our goal without collaboration among the partners. Discussion with team was open-minded, we are listening to the opinion of each other without any unnecessary dispute. It was my pleasure being teammates with him.

I would like to extend my deepest appreciation to all professors and instructors I met during master's degree course in the College of Management Mahidol University, especially Dr. Roy Kouwendberg and Dr. Worapong Janyangyuen who gave many insightful questions and professional suggestions as committee members. Lastly, I want to appreciate my classmates as well, especially Mr.Donghyun Kim , Mr Chinnasri Kaewnimitr and Mr. Rut Jungvong, who always have been team together with me throughout the course. I could have enjoyed the studies thanks to the guys, even in the harsh Covid-19 days.

Vimphan Moungnual

RELATIVE VALUATION OF KCE ELECTRONICS PUBLIC COMPANY LIMITED

VIMPHAN MOUNGNUAL 6349061

M.M. (COPORATE FINANCE)

THEMATIC PAPER ADVISORY COMMITTEE: ASST. PROF. SIMON ZABY, Ph.D., PROF. ROY KOUWENBERG, Ph.D., CFA, WORAPONG JANYANGYUEN, D.B.A.

ABSTRACT

The purpose of this valuation report is to find the target price of KCE Public Company Limited (KCE), one of the massive PCB manufacturers for Automotive in Thailand and listed in the global top rank. In 2017-2021, KCE's revenue growth was slow down from the impact of COVID-19 spreading in global. During the past phase, KCE projected that there are sustainable potential in Automotive market especially EV car which require a massively technology inside. Therefore, KCE invest a lot in expansion the facility and technology and plan that they will reverse back to achieve CAGR 15% from 2022- 2026. The terminal growth estimated 2.14% as perpetual growth after year 2026. After discounting the free cash flow to the firm in the projection period, estimated share value was found as 77.86 THB. The target price is directly above compared with the current stock price at 65.60 Baht per share as of 31st March 2022. It simply imply that the current price is undervalue to the target price. The incoming trend of technology in passenger car and emerging of EV car market would trigger the high demand of PCB part and strengthen the financial performance of KCE company. Thus, the recommendation for the existing and potential investors to KCE is "Buy", or until any further new business plan release out from the company.

KEY WORDS: KCE/ Discounted Cash Flow/ PCB for Automotive/ EV

40 pages

CONTENTS (cont.)

CHAPTER IV FINANCIAL STATEMENT ANALYSIS	17
4.1 Study of Historical Financial Data	17
4.1.1 Sales	18
4.1.2 Costs of Goods Sold (COGS)	18
4.1.3 Sales and Administrative Expenses	18
4.1.4 Net Income (NI)	18
4.1.5 DuPont Analysis	19
4.1.6 Return on Asset Analysis	19
4.1.7 Liquidity Ratio Analysis	20
4.2 Projections of KCE Electronic Financial Statement	21
4.2.1 Sale Forecast Projection	22
4.2.2 Cost of sale projection	25
4.2.3 SG&A expenses	26
4.2.4 Pro-Forma income statement	26
CHAPTER V VALUATION OF KCE	27
5.1 Discount Cash Flow Valuation	27
5.1.1 WACC	27
5.1.2. Terminal growth	31
5.1.3 DCF Valuation Result	32
5.1.4 Sensitivity Analysis	34
5.2 Valuation Recommendation	35

CONTENTS (cont.)

CHAPTER VI INVESTMENT RISKS AND DOWNSIDE POSSIBILITIES	36
6.1 Industry Risk	36
6.2 Business Risk	37
CHAPTER VII CONCLUSION	39
REFERENCES	41
BIOGRAPHY	45



LIST OF TABLES

Table	Page
1.1 Financial Highlight	1
2.1 Sales Breakdown by Products	6
2.2 Sales Breakdown by Region	7
2.3 Revenue and Net Profit 2017-2021	8
4.1 Dupont Analysis	20
4.2 Revenue Stream by Products	23
4.3 THB against EUR AND USD	24
4.4 InterBank Rate (i)	24
4.5 InterBank Rate (ii)	24
4.6 Copper Price	25
4.7 Cost of goods calculation	26
4.8 Pro-Forma income statement 2021-2026	27
5.1 KCE Rating	28
5.2 KCE Debt	28
5.3 Market Risk Premium	30
5.4 Peers BETA	30
5.5 WACC Calculation	30
5.6 Long Term Growth Forecast	31
5.7 Inflation and GDP forecast	31
5.8 Working Capital Projection	32
5.9 Depreciation and Capital expenditure projection	33
5.10 DCF Calculation	33
5.11 Share Price Calculation	34
5.12 Sensitivity	35
5.13 Recommendation	35

LIST OF FIGURES

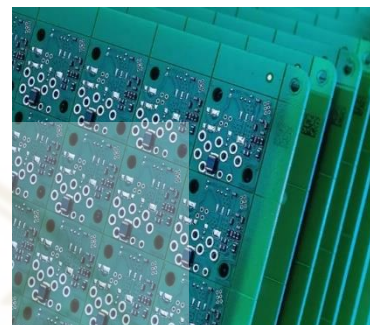
Figure	Page
2.1 KCE manufacturing in Lat Krabang	3
2.2 The chronological business development of KCE group	4
2.3 Types of PCB	4
2.4 Copper Clad Laminate (CCL)	5
2.5 PCBs ingredient and Fabrication	6
2.6 Revenue and Net Profit 2017-2021	8
3.1 New covid-19 cases in China	11
3.2 Inflation	11
3.3 Copper Price Graph	12
3.4 PCBs Maker Value	13
3.5 No. of new car registration in Europe	14
3.6 EU passenger car registration Growth YoY	14
3.7 U.S. Automotive Growth Chart	15
4.1 Revenue & COGS	18
4.2 SG&A	19
4.3 Revenue and Net Income	20
4.4 ROA	21
4.5 Liquidity Ratio	21
4.6 Cash Conversion Cycle	22
4.7 Revenue Stream by Region	23
4.8 Copper price trends	25
5.1 WACC	27
5.2 CAPM	29
5.3 Risk Free Rate	30

LIST OF ABBREVIATIONS

KCE	KCE Electronics Public Company Limited
IT	Information Technology
PCB	Printed Circuit Board
CAGR	Compound Annual Growth Rate
SET	The Stock Exchange of Thailand
B2C	Business to Consumer
B2B	Business to business
EV	Electric car
SEC	Securities and Exchange Commission
AGM	Annual General Meeting of Shareholders
GDP	Gross Domestic Product
4P	Products, Price, Place, and Promotion
DCF	Discounted Cash Flow
EBIT	Earning Before Interest and Tax
CAPEX	Capital Expenditures
ROE	Return on Equity
D/E	Debt-to-Equity
AR	Account Receivable
AP	Account Payable
THB	Thai Baht
WACC	Weighted Average Cost of Capital
FCFF	Free Cash Flow to the Firm
COGS	Cost of Goods Sold
PDPA	Personal Data Protection Act

CHAPTER I INTRODUCTION

KCE Electronics Public Company Limited (**KCE**) was established on 5 November 1982 in Thailand. The company main product to produce and distribute Print Circuit Boards (PCBs) for Automotive industry worldwide. The PCBs produced from epoxy glass copper clad which manufactured under their group company.



KCE's stock was first trading day in the stock exchange of Thailand (SET) on 30 August 1988 with registered capital THB 591,396,798.00 the current closing price on 31 Mar 2022 is THB 65.50 per stock while trading volume estimated around THB 11,038,600

Table 1.1 Financial Highlight

KCE Financial Highlight	2017	2018	2019	2020	2021
Total Sales Revenue	14,195.41	13,982.49	12,097.37	11,527.16	14,937.78
EBITDA	3,359.66	2,815.60	1,853.62	2,328.54	3,735.63
Net Profit	2,544.50	2,014.87	934.49	1,126.79	2,426.28
Net Cash from Operating Activities	3,455.68	2,669.59	2,270.91	2,209.82	1,690.33
EPS in Baht	2.17	1.72	0.80	0.96	2.05
Total Asset	17,850.25	18,121.01	16,501.00	17,377.04	21,950.73
Total Liabilities	6,575.95	6,113.91	4,739.06	5,315.02	8,508.64
Total Shareholder's equity	11,229.00	11,951.00	11,712.00	12,010.00	13,380.00
Dividend Yield	2.66%	4.19%	3.88%	1.93%	1.70%

Source: (KCE Electronic, 2020)

KCE's main sources of total revenue 70% from exporting PBCs for automotive industry worldwide 50% of customers in Europe while both 20% from each Asia and the United States and the rest of 10% sell locally.

According to table 1.1 Financial Highlight of KCE, total revenue in 2021 and net profit increased by 30% and 115% respectively compared to 2020. because Europe and the U.S. economic rebound from Covid-19 pandemic. The revenue mainly from Electronic Vehicle (EV) expected sales growth by 15% in the next 5 years. However, if we compared 2021 to 2017 CAGR increased only 1% but EV is in a worldwide trend thus we are optimistic that KCE will growth sustainability in the long term.

This paper is particularly intention to estimate KCE stock price during 2022 – 2024 by using the relative valuation method including analysis of financial and business performance,

The first part will be conducted introduction of KCE with its business, products activities, strategies. Secondly, analysis of Macro Economic in both Europe, United states, Industry analysis for the factors impact KCE revenue. Secondly, the analysis of the country's economy, also competitors. Thirdly, we will focus on historical financial data to understand business performance and projected in key financial. fourthly, we will estimate the Valuation method and the risk of business. Finally, in the conclusion part we will summarize all analysis and recommendation to the investors.

CHAPTER II

BUSINESS DESCRIPTION

This chapter will introduce more deeply to KCE group of business for instance Company History and the outline of the business, Products information and categories, Revenue structure and company previous and existing strategy.

2.1 Overview of Business

KCE Electronics PCL (KCE) business is producing and focusing on so-called “Printed Circuit Boards” (PCBs) (Paul, 2012). PCBs become parts of manifold devices in various of electronic products such as automotive electronic equipment, telecommunication devices, computer networks, industrial equipment, medical equipment and consumer products.

KCE is currently focusing on automotive industry to serve the demand of electronic vehicle (EV) market worldwide mostly export to Europe, United states and Asia. The company was ranked the 6th largest automotive PCB producer of the world in 2021 with expert experience more than 20 years (KCE Electronic, 2020).



Figure 2.1 KCE manufacturing in Lat Krabang



Figure 2.2 The chronological business development of KCE group

Source (KCE Electronic, 2020)

KCE Group company in Thailand

1. Electronics Public Co., Ltd. (**KCE**) recently became a public company listed on the (SET) under stock name **KCE**.
2. KCE International Co., Ltd. (**KCEI**) is a manufacturer and distributor of **double-sided** PCBs.
3. KCE Technology Co., Ltd. (**KCET**) is a manufacturer and distributor of **multilayer** PCBs, mostly for 4-6 layers.
4. Thai Laminate Manufacturer Co., Ltd. (**TLM**) is a raw materials manufacture and distributor of copper clad laminate (Laminate) and pre-impregnated fiberglass (Prepeg).

2.2 Products

Printed Circuit Board (PCB), The core business of KCE group is to produce and distribute Printed Circuit Board (PCBs). The main revenue mostly from being a supplier for automotive industry.

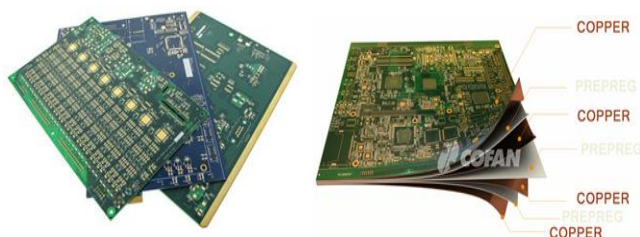


Figure 2.3 Types of PCB, Source (SANTOSH, 2021)



Figure 2.4 Copper Clad Laminate (CCL), Source (SANTOSH, 2021)

Printed Circuit Board (PCBs) have a copper pad plate onto the board being as a pathway for electrical signals consist of two main parts: 1) Base or substrate made from epoxy fiberglass 2) Conductor to connect the different components on the PCBs (Bob, 2020).

The three main types of PCB

1. Single-sided PCB: the one printed side of copper layer for electrical signal connection with simple production process.
2. Double-sided plated-through-hole PCB: the two sides printed of copper layer for electrical signal connection on both sides of the board.
3. Multilayer PCB: the complicated printed layers connected with plated-through holes of the board (SANTOSH, 2021)

Single-sided PCB	Double-sided plated-through-hole PCB	Multilayer PCB

Figure 2.5 PCBs ingredient and Fabrication

Source: KCE annual report, (SANTOSH, 2021)

2.3 Revenue Structure

KCE has 3 main sources of revenue structure provided different products and services 1) Original Brand Manufacturer (OBM) 2) Prepreg Laminate Business and 3) Chemical business. According to table 2.1 Sales Breakdown table below shows that majority source of revenue mainly from Multilayer PCBs above 80% of total revenue since 2017 – 2021. Second source of revenue from Double Sided has been reducing from 16% to 9% in 2021 (CAGR-10%) due to company strategy to focus on more complicated multilayer (CAGR+1.5%).

Recently, PCB producers are likely to make PCBs more flexible, thinner for high technology in automotive industry to strengthen the vehicle more comfortability, safety, and environment friendly. For example, in term of safety in the automotive sector the government in many regions revised Safety Regulation so that PCBs as a significant part in vehicle developed safety system to comply with the law such as Intelligent Speed Assistance System, Autonomous Emergency Braking System, Belt Pre-Tensioner System those factors are positively increasing demand for PCBs automotive market.

Raw material of PCBs are Prepreg and Laminate produced by TLM, In 2020 KCE purchased Prepreg and Laminate locally from TLM estimated 70% of total usage while imported remaining of 30% caused CAGR of Prepreg and Laminate growth by 63%

Table 2.1 Sales Breakdown by Products

SALES by Products	2017		2018		2019		2020		2021		CAGR 2017-2021
	Million Baht	%	Million Baht	%	Million Baht	%	Million Baht	%	Million Baht	%	
OBM PCB											
Double Sided	2,297.84	16.19%	2,003.17	14.33%	1,641.36	13.57%	1,280.63	11.11%	1,344.40	9%	-10.17%
Multilayer	11,480.17	80.87%	11,512.77	82.34%	9,966.41	82.38%	9,105.17	78.99%	12,398.36	83.00%	1.55%
									-		
Prepreg Laminate Business	71.77	0.51%	74.84	0.54%	174.53	1.44%	756.75	6.56%	821.58	5.50%	62.83%
									-		
Chemical Business	345.63	2.43%	391.71	2.80%	315.07	2.60%	384.61	3.34%	373.44	2.50%	1.56%
									-		
Total Sales Revenue	14,195.41	100.00%	13,982.49	100.00%	12,097.37	100.00%	11,527.16	100.00%	14,938	100.00%	1.02%

Source (KCE Electronic, 2020)

In July 2021 NTI-100 reported that 127 PCBs manufactures in the world performed output of USD 68.672 billion. Global market increased by 8.9% while KCE

was ranked 41st PCBs maker in the world in 2020. Moreover, for automotive PCBs maker KCE was ranked the 6th largest manufacturer in 2021.

According to Sales Breakdown by region below found that KCE mainly export to Europe nearby 50% since 2017 followed by 20% for both United States, Asia and the remain for local buyer. Source: Rocket PCB (Rocket-PCB, 2020)

Table 2.2 Sales Breakdown by Region

SALES by Region	2017		2018		2019		2020	
	Million Baht	%	Million Baht	%	Million Baht	%	Million Baht	%
Europe	7,807.48	55.00%	7,550.54	54.00%	6,411.61	53.00%	5,602.20	48.60%
United States	2,455.81	17.30%	2,712.60	19.40%	2,358.99	19.50%	2,397.65	20.80%
Asia	2,910.06	20.50%	2,684.64	19.20%	2,322.70	19.20%	2,524.45	21.90%
Local	1,022.07	7.20%	1,034.70	7.40%	1,004.08	8.30%	1,002.86	8.70%
Total	14,195.41	100.00%	13,982.49	100.00%	12,097.37	100.00%	11,527.16	100.00%

Source: KCE annual report 2020

In 2017 KCE was the most successful year with highest Revenue THB 14,195.41M, Net Margin THB 2,531.00M. due to increasing manufacturer capacity Phase 1, 2 and new factory phase 3 to incremental capacity in Lat Krabang Industrial Estate. However, compared 2018- 2019 revenue dropped by 13.5%, Net Margin dropped by 53.6% caused by the slowdown of automotive market in Europe and United States. Moreover, Thai baht was appreciation against USD, Euro and lower usage of production capacity thus those factors are heavily impacted to KCE financial highlight.

Referring to annual report found that in 2021. KCE reached total production capacity at 40.8 million square feet per year. The demand for automotive market just has been recovered from Covid-19 pandemic caused to revenue returned to THB 14,937.78M. similarly as of 2017 (KCE Electronic, 2020).

Table 2.3 Revenue and Net Profit 2017-2021

	2017	2018	2019	2020	2021
Total Revenue	14,195.41	13,982.49	12,097.37	11,527.16	14,937.78
Net Profit	2,531.00	2,012.00	930.00	1,130.00	2,453.00
Net Margin (%)	18.05%	14.55%	7.85%	9.91%	16.48%

Source: KCE annual report 2020

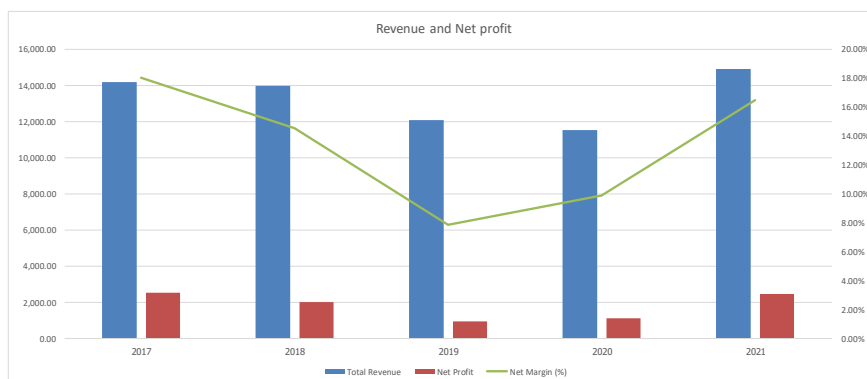


Figure 2.6 Revenue and Net Profit 2017-2021

Source: KCE annual report 2020

2.4 Strategies

Since covid-19 pandemic spread in early 2020 impacted economics situation worldwide to all sectors. people lifestyle has changed to new normal. KCE had been critically impacted to it' business, Sales Growth reduced 4.7% in 2020 compared to 2019 due to final buyer delayed buying a new car and working from home policy released to control people transportation at that time.

However, in 2021 the restriction was relaxed for people who have vaccinated allow to travel and live with a new life with current situation as same as KCE aware of new normal with more complicated and customer behavior changed.

People tend to purchase more family car to travel privately and securely those will directly impact to demand of new registration car in Europe and the United States market.

KCE is currently focusing on R&D developing advanced technology to strengthen it production quality by implementing artificial intelligence technology (AI) in manufacturer. KCE invested heavily of USD 6M. in 2020 for purchasing new machinery for HDI production. Moreover, KCE planed of further investment of USD30 for High-tech PCBs which is new product and tend to be a crucial sustainable long-term growth in the near future (KCE Electronic, 2020).

CHAPTER III

MACROECONOMIC, INDUSTRY ANALYSIS, COMPETITION ANALYSIS

This chapter generally explain about the Macro and Micro perspective related to the KCE business. The analysis begin with Marco economic section which describe the global factor which impact to the KCE business. The industry analysis mainly discusses on how automotive industry change relatively with KCE positioning and lastly competitors' analysis which mention about the peer's selection for comparable reason.

3.1 Macro economic Analysis

World Economic Outlook

2022 is a year of economic recovery from dramatically Covid-19 pandemic since 2020. There are various optimistic factor to encourage economic satiation in this year such as number of World fully doses vaccination is 58% in Mar 2022, many counties started fully opening the country without quarantine manner in April 2022, restaurants, nightclubs, shopping malls, department stores are operating normally as same as factories in industries zone.

There are weakness point to hit economics growth such as lack of goods shipment worldwide including Global Supply Chain disruption, Containers shortage, Inflation raises, Chips shortage and especially Russia – Ukraine Invasion. Since Russia is an energy supplier 10% of the World including natural gas and oil, we are concerned about those pricing up to higher the cost of its industry.

3.1.1 World GDP Forecast

IMF expected Global GDP growth rate from 5.9% in 2021 to 4.4% in 2022 predicted based on two largest economies the United States and China. For the United

States aim to internal investment from Build Back Better fiscal policy for mainly improvement of infrastructure within the country while China has zero-covid policy since 2019 but seem to be unsuccessful as new cases of Covid-19 in mainland China is reached up to 7,500 cases a day (IMF, 2022) (Patricia, 2022).

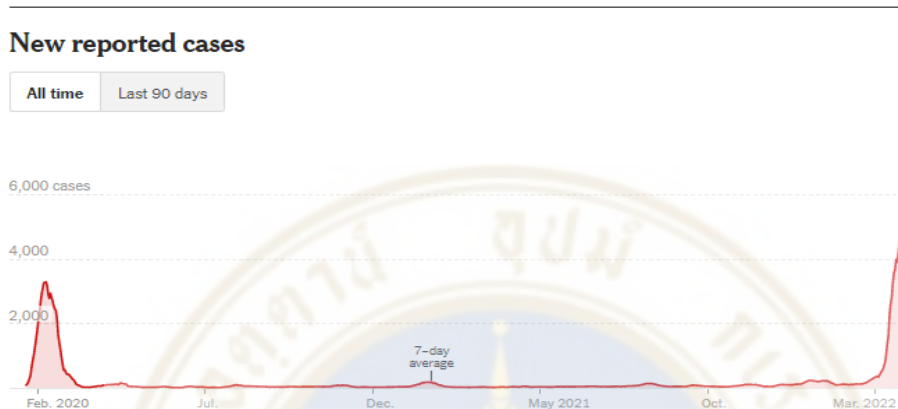


Figure 3.1 New covid-19 cases in China

Source: IMF, NY times

3.1.2 Inflation Raise

Higher inflation rate caused by higher cost of consumption, energy, and food. The policymakers attend to gradually increase policy rate led by FED goes up to rate by 0.25% on 17 Mar 2022 to reduce high inflation rate.

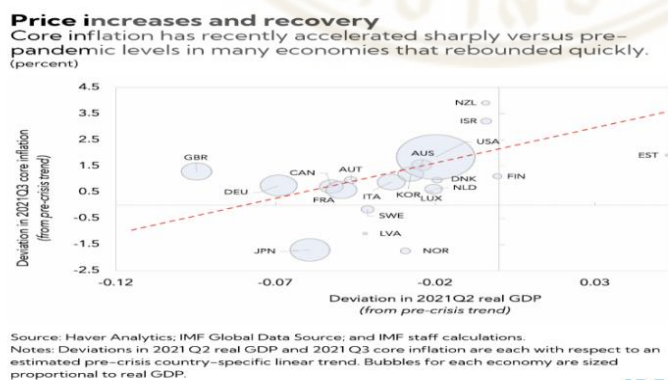


Figure 3.2 Inflation, Source: (IMF, 2022) (ELISSA, 2022).

3.1.3 Europe Economic Outlook

Europe economy expected to by 4.0% in 2022 and 2.8% in 2023 after the rebound in economics. EU still concern on energy uncertainty price and tend to go up from Russia – Ukraine invasion begins in Feb 2022 combination higher inflation effects higher energy price. On the other hand, internal consumption is stronger than expected with investment in euro zone (Commission, 2022).

3.1.4 US Economic Outlook

The US economy is now on recovering process from Covid-19 outbreak. The performance is better than expected with lower unemployment rate while internal investment and cooperate profit are satisfied from Biden’s Build Back Better policy to focus on internal infrastructure development with the budget approximately of USD 2.2 trillion. (Commission, 2022), (House, 2021).

3.1.5 Copper Price

Copper is one of raw materials to produce PBCs as Copper is conductive signal without losing electricity when transmit the signal. Since 2020 Copper price has been going up from USD 2.82 per pound in Jan 2020 to USD 4.68 per pound in Mar 2022 or 60% within 2 years impact cost of goods sold increased. In 2021 Copper price was fluctuated from copper mine closure in Peru and Chile impacted Copper supply chain



Figure 3.3 Copper Price Graph,

Source: (Economics, Trading Economics , 2022), (Knoema, 2021)

3.2 Industry Analysis

The global automotive PCB Market was valued at USD 8.5 billion in 2017 expected to reach (Figure 3.4) USD14.3 billion in 2026 with CAGR growth rate at 6.3%. PCEs is used for a significant component part of vehicle. The key driving for PBCs in automotive is to develop Advanced Driver Assistance Systems (ADAS) a car feature to support automated driving systems safer, entertainment and comfortable as a result the significant key is to reduce an accident and save a life.

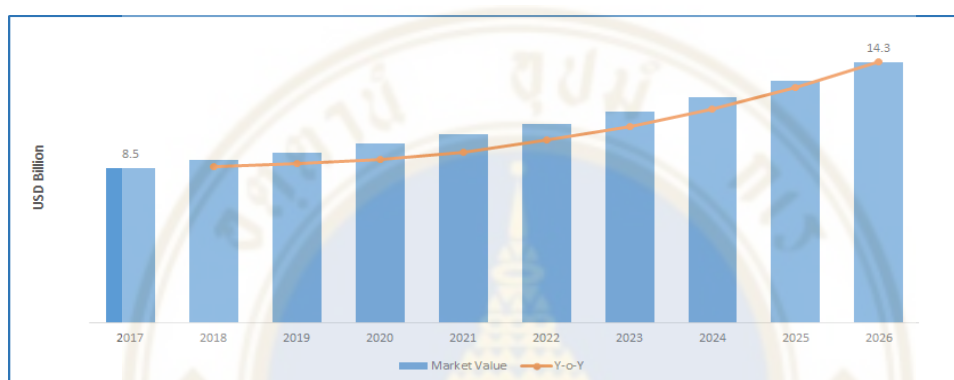


Figure 3.4 PCBs Maker Value

Source: (Research, 2018)

KCE main sources of revenue generated from exporting 50% to Europe and the U.S. while 20% from Asia so that we will estimate the car registration number in those region as they are main customers of KCE.

For Europe market in April – May 2020 car registrations in Europe was impacted by Covid-19. During Mar – Mar 2021 new cars increased more than 2020 for the same period but the rest of 2021 was reduced again around 20%. However, we see a positive sign on Jan 2022 that demand of new car in Europe is gradually increasing as same as KGI Securities Research said that new car registration in Europe will growth up to 7.9% in 2022 as same as MarketWatch published that Europe EV market size expected to grow by 20.9% for the period of 2020-2030.

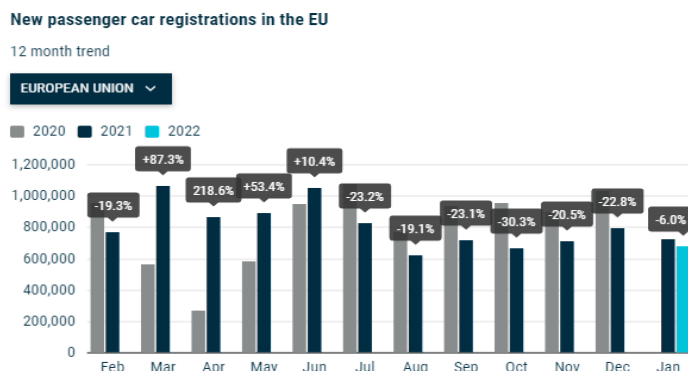


Figure 3.5 No. of new car registration in Europe,

Source: Market Watch, (Acea, 2022)

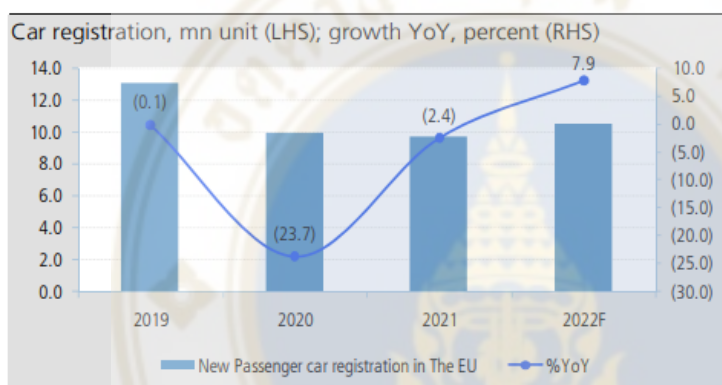


Figure 3.6 EU passenger car registration Growth YoY

Source: KGI Securities Research

For United States market. Automotive growth chart shows below that in 2020 growth rate was -16% impacted by Covid-19 similarly to 2008-2009 The Great Recession crisis the growth approximately 25%. However, in early 2022 the growth rate is returned to pre Covid-19 in 2019 which is an optimistic sight for growing next year because the U.S. unemployment rate dropped to 3.9% in December 2021.

UNITED STATES TOTAL AUTOMOTIVE GROWTH CHART

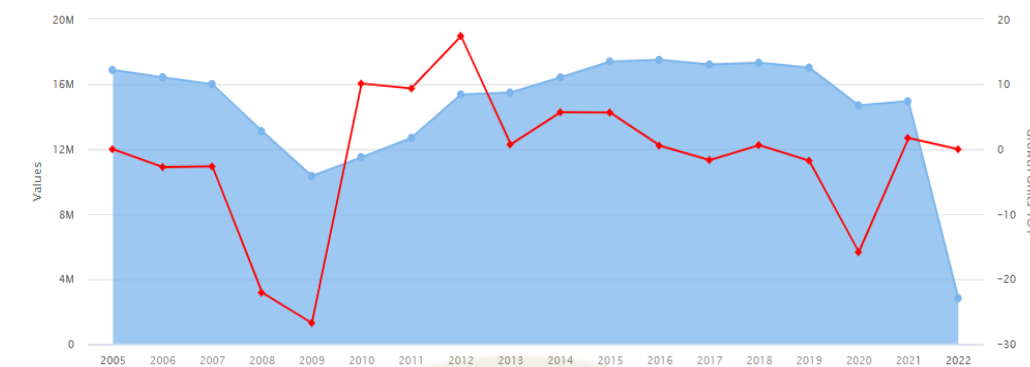


Figure 3.7 U.S. Automotive Growth Chart

Source: (Analysis, 2022), (CHRIS, 2018)

3.3 Competition analysis

Porter's Five Forces is a model to analyze five factors of risk to help company to determine an industry's weaknesses and strengths.

KCE Five Forces Analysis

1. High competition in the industry

Currently, KCE is ranked 6th of automotive maker in the world. However, there is high competition from Chinese and Taiwanese producers, especially Chinese PCBs producer they have lower cost of worker, bigger capacity, higher investment, product differentiation. Moreover, China has Tesla Gigafactory a manufactory to produce Tesla' EV feed to Europe demand about 2,000 vehicles per day which is a significant number

2. Low potential of new entrants into the industry

PCBs maker is high competition so far thus, if any new company want to participate to this market may need to intensively invest in factory, advanced technologies, and skilled workers. Moreover, economies of scale to produce is significantly factor to consideration.

3. Low bargaining power of suppliers

KCE has an advantage of suppliers to provide raw material Laminate and Prepreg from Thai Laminate Manufacturers Co., Ltd. their own subsidiary company thus, KCE has authorize and power to negotiate suppliers.

4.High bargaining power of customers

Although KCE is a Tier 1 automotive supplier for the past 20 years. However, the clients are mainly located in Europe and the United States which are luxury automotive companies and powerful to negotiate the orders and prices so that KCE may need more time to step up to reach Medium bargaining power of customers.

5. Medium threat of substitute product

Recent day if any PCBs maker can produce or R&D of Advanced Technology may be a medium-term risk because they need to take times to be a mass product in production process. However, the substitute product can be fully replaced once we discovered new raw material which will be considered as in the long-term risk of substitute products.

Competitors List

1.Hana Microelectronics Public Co., Ltd.

HANA has been engaged in electronics component for over 40 years to produce The Printed Circuit Board Assembly (PCBA) and Integrated Circuit (IC), currently they head office in Bangkok and 6 manufacturers based in Thailand, USA, China and Cambodia (HANA, n.d.)

2.SVI Public Company Limited

SVI was established since 1985 in Thailand to provide Electronics Manufacturing Services (EMS) worldwide. The company engaged in variety of many sectors such as Automotive, clean energy, communication, and network. The main 75% of client is in Europe while the rest of 25% are based in United States and Asia (SVI, n.d.).

3.Delta Electronics (Thailand) Public Co., Ltd.

DELTA is recently producing various products to serve electronic components segment such as information technology, automotive, industrial appliance, medical industries, and telecommunication. The company mostly export to Asia, Europe and South America markets (DELTA, n.d.).DELTA stock was taking of the town due

to pricing aggressively increased up to 165% in Sep 2021 at THB768.0 per stock but finally stock price dropped to THB388.0 on 31 Mar 2022

4.Chin-Poon Industrial Co. Ltd.

Chin-Poon is established in Taiwan since 1979. The company is specialized in producing PCBs with high technology and good reputation in the market. Chin-Poon has a representative manufactory in Bangkadi Industrial Park, Pathumthani, Thailand (Chin-Poon, n.d.).

5.Unimicron Technology Corporation

Unimicron's head office is in Taiwan founded in 1990 to produce and distribute PCBs for cellular phones, tablet, gaming devices and image sensors (Unimicron, n.d.).

Peer Analysis

The competitors list will use for settling a peer benchmark in relative valuation part for KCE. The companies listed in the Stock Exchange of Thailand such as Hana, SVI and Delta, even though those company not intensively focus on Automotive PCB maker, but they are suitable competitor benchmark for semiconductor industry sector in Thailand which having sufficient comparable information.

For better applying the model, we select Chin Poon and Unimicron which is direct competitor with KCE Electronic Thailand for Automotive PCB business. Those Taiwanese company continually be a main player and potential threaten to acquire the market share from KEC. Therefore, there are suitable peer to compare the business competency and earning margin ability with KCE. Therefore, with the intensive of gathering information from insider and external source, we typically ensure that the peer's analysis is more reasonable than selecting all listed technology company in Stock Exchange of Thailand or select the global semiconductor company which might not fair for the target firm because excessively difference of business scale.

CHAPTER IV

FINANCIAL STATEMENT ANALYSIS

4.1 Study of Historical Financial Data

In this Financial Statement Analysis chapter, we will study and analysis the historical financial performance of KCE since 2017 including key financial factors such as Sales, Cost of Goods Sold (COGS), Expenses, Net Income (NI) and other related financial ratios. After that we will estimate forecasting those factors in projection financial analysis part for both SCF and relative valuations.

4.1.1 Sales

During 2017-2019 Sales has CAGR decreased by 3.15% mainly from a slowdown from automotive demand and THB appreciation against to both of USD and Euro which are two main currencies of revenue. However, for period 2019-2021 Sales CAGR has been gradually increasing up to 4.31% especially in 2021 the revenue going up to nearby Sales in 2017 which is a good sign of market recovery from post covid-19 pandemic and higher demand in the automotive market (KCE Electronic, 2020).

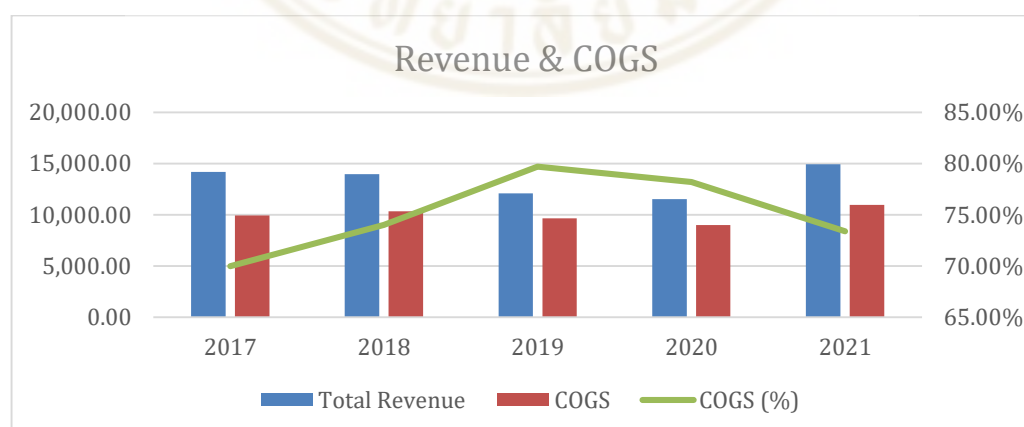


Figure 4.1 Revenue & COGS

Source: (KCE Electronic, 2020)

4.1.2 Costs of Goods Sold (COGS)

In 2019 KCE cost of goods sold was reached up to 80% of total revenue from 74% in 2018 and 70% in 2017 respectively mainly impacted from higher cost and foreign currency exchange rate fluctuation THB appreciation against both USD and EUR (KCE Electronic, 2020). However, in 2021 KCE has well management of COGS to hedge forward exchange rate and lower of copper raw material.

4.1.3 Sales and Administrative Expenses

Selling, general, and administrative expense approximately 13% of total revenue. Since 2019 the expensed has been gradually decreasing from 13% to 11% in 2021 because decreasing in lower Sales, employee working hours and cut in all expenses (KCE Electronic, 2020).

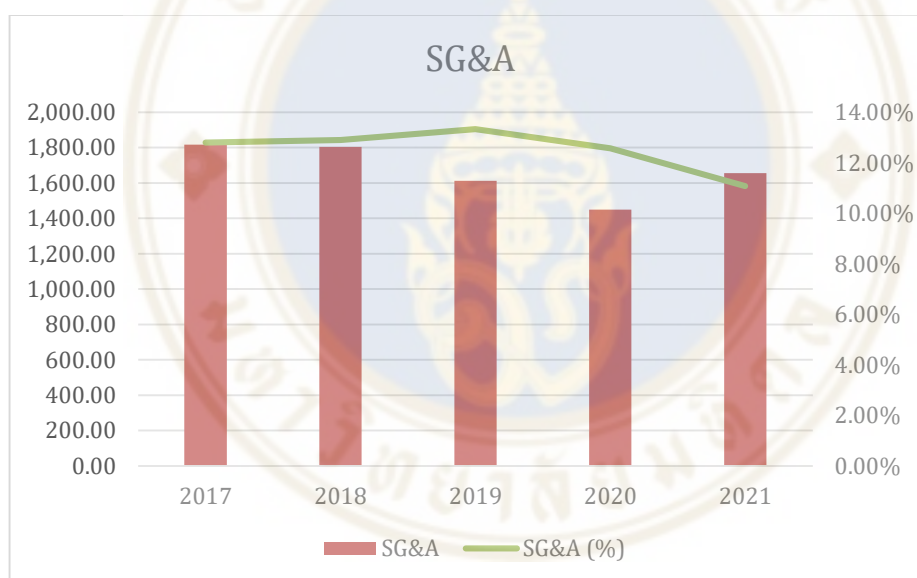


Figure 4.2 SG&A,

Source: (KCE Electronic, 2020)

4.1.4 Net Income (NI)

Net Income is significant increasing from 8% in 2019 to 16% in 2021 mainly from post-covid-19 and lower in cost of goods sold that lead to a higher margin. Moreover, there is a new plant in Lat Krabang to boost revenue to reach economies of scale and maximize margin (KCE Electronic, 2020).

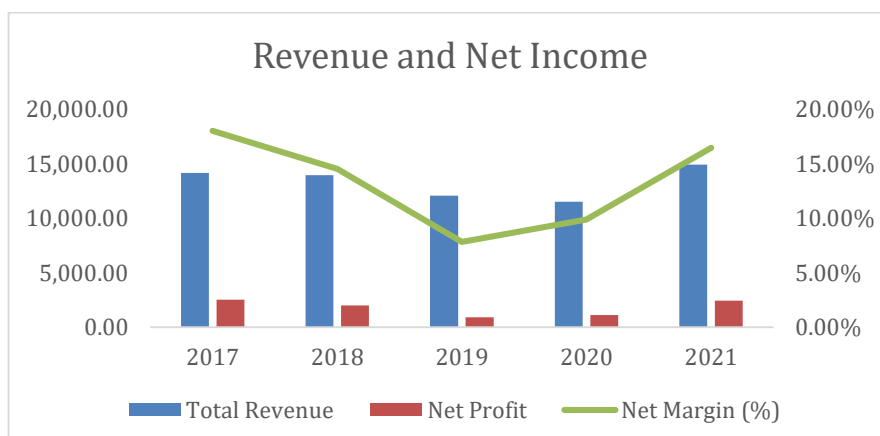


Figure 4.3 Revenue and Net Income

Source: (KCE Electronic, 2020)

4.1.5 DuPont Analysis

Dupont analysis of ROE (Return on Equity) is a ratio that help investor to estimate the company whether that company has well return on investment. According to Dupont ROE below found that Net Profit has closely relationship with ROE as estimated in 2019 ROE was 7.86% while Net Profit was dropped significantly to 10% from previous graph. Higher ROE is better return so that in from 2019-2021 KCE has ROE gradually been increasing assumed that KCE would be more attractive to investor even compared to peer companies.

Table 4.1 Dupont Analysis

DUPONT Analysis	KCE					HANA	SVI	DELTA
	2017	2018	2019	2020	2021	2021	2021	2021
Net Profit	2,531.00	2,012.00	930.00	1,130.00	2,453.00	1,545.31	1,407.62	6,699.01
Equity	11,229.00	11,951.00	11,712.00	12,010.00	13,380.00	23,058.09	5,204.78	41,404.30
Asset Turnover	0.81	0.78	0.70	0.68	0.68	0.91	1.36	1.35
Dupont ROE	23.86%	17.36%	7.86%	9.53%	19.32%	6.70%	27.04%	16.18%

Source: (KCE Electronic, 2020). Own calculations

4.1.6 Return on Asset Analysis

Return on Asset (ROA) is a financial ratio to indicate that how profitable a company to generate to its total assets. According to Figure 4.4 found that KCE ROA moves between 6% – 14% during 2017 – 2021. The lowest was in 2019 impacted from reduction of property value, plant, equipment, and other related assets. However, during

2020 – 2021 ROA has been gradually increasing mostly from increasing of liquidity reserve and account receivable (KCE Electronic, 2020).

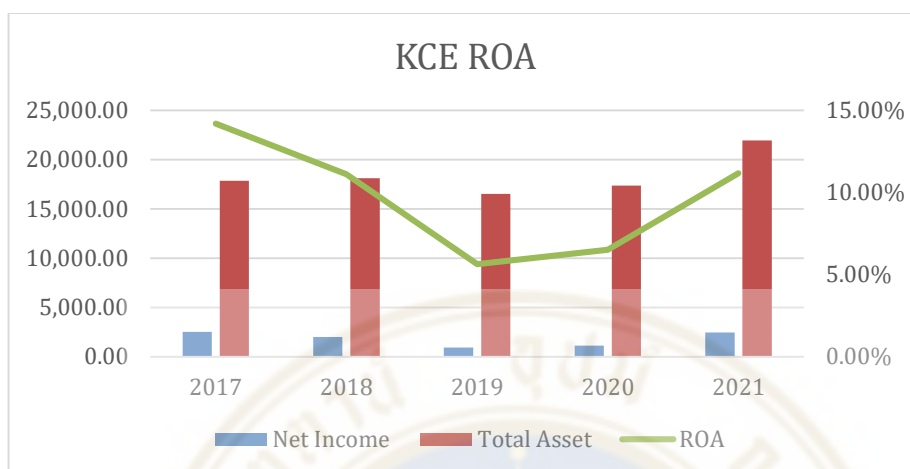


Figure 4.4 ROA

Source: (KCE Electronic, 2020)

4.1.7 Liquidity Ratio Analysis

This Liquidity Ratio part we will estimate the ability of KCE to repay short-term obligations within one year during the last five years since 2017 – 2021. For this estimation we will focus on Quick Ratio because it removed inventory from calculations thus, Quick Ratio will more accurately to estimate KCE liquidity as shows in Figure 4.4 found that Current Ratio stands around 1.5x-2.0x while Quick Ratio stands around 1.0x. mean that KCE has well ability to repay it short-term debts and obligations. However, the Quick Ratio graph seems to be lower trend which is a challenging for KCE to manage liquidity ratio further. (KCE Electronic, 2020)

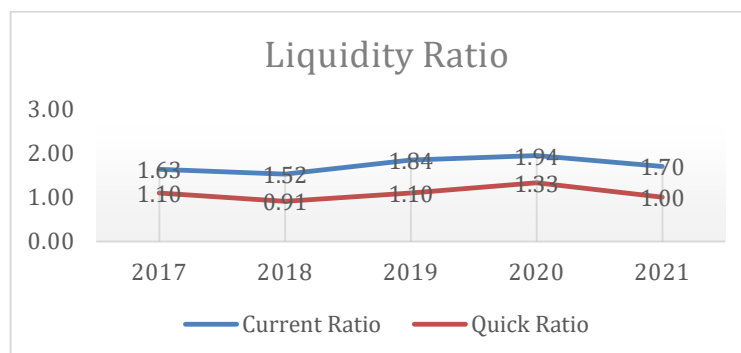


Figure 4.5 Liquidity Ratio, Source: (KCE Electronic, 2020)

Cash Conversion Cycle (CCC) is a measurement to show the range of time that company could convert its investment to cash flow from sales activity. According to Figure 4.6 found that KCE in the past four years has well management since 2018 CCC been gradually reduced especially in 2020 CCC is calculated at 109 days from 126 days in 2017 mainly from reduction Average Receivables Collection Days and longer in Average Payables Payment Days.

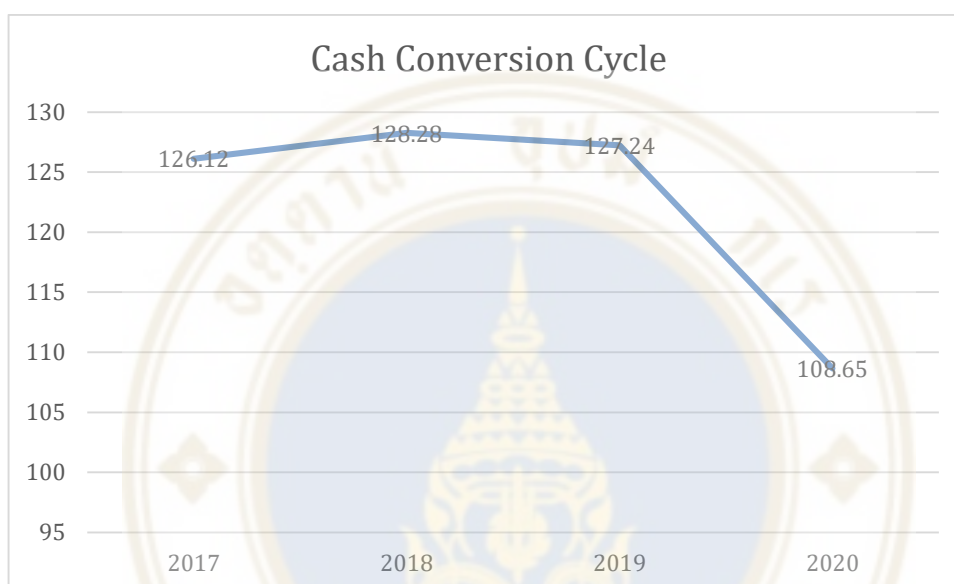


Figure 4.6 Cash Conversion Cycle,
Source: (KCE Electronic, 2020).

4.2 Projections of KCE Electronic Financial Statement

4.2.1 Sale Forecast Projection

The sale revenue able to divide into 4 main tentatively. The printed Circuit Board which sold to each region Europe 39%, United State 33%, and Asia 16% respectively (Figure 4.7) The other sale consists of chemical and prepreg laminate business 12% which not significant growth expectation in the business strategy of KCE (KCE Electronic, 2020).

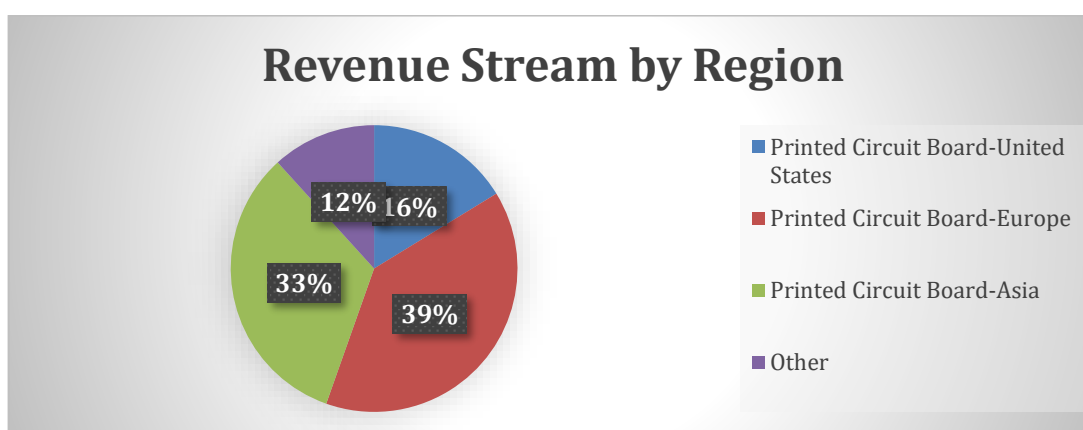


Figure 4.7 Revenue Stream by Region

Source: (KCE Electronic, 2020)

The projection expects to grow around 15- 20% per year. With the macroeconomic analysis from previous chapter, it's forecast that the upcoming trend will be the increasing of EV car and the increase of passenger car from Europe. For year 2022, the EU passenger car increase around 8% which imply that the limited supply of semiconductor raw material gradually recovers, and overall expectation of EU car market will increase 23% from last year. Europe is the region that most concern on environment problem, Therefore, electric vehicle will be outstanding growth rather than other region. In this case (table 4.1), we projected the No. of multilayer PCB sell to Europe will increase around 23%. Other region will grow proportionally 8% according to KCE internal forecasting. KCE also incremental invest for their production capacity the factory to prepare for significant increasing trend of electrical automotive part.

Table 4.2 Revenue Stream by Products

	2021 A	2022F	2023F	2024F	2025F	2026F	CAGR
	14,938.00	17,834	20,993	24,852	29,590	35,433	15%
	Growth	19.39%	17.71%	18.38%	19.06%	19.75%	
Printed Circuit Board-United States	2,427.9	2,670.7	2,937.7	3,231.5	3,554.7	3,910.1	8%
Printed Circuit Board-Europe	5,851.0	7,489.23	9,586.21	12,270.35	15,706.05	20,103.75	23%
Printed Circuit Board-Asia	4,904.8	5,395.2	5,934.8	6,528.2	7,181.1	7,899.2	8%
Other	1,754.2	1,929.6	2,122.6	2,334.8	2,568.3	2,825.2	8%
Ex Rate Effect		2%	2%	2%	2%	2%	

Source: (KCE Electronic, 2020)

Ever since the most of revenue targeted on oversea. The impact of exchange will significantly affect the projection of KCE sale. The Euro currency will effect on the revenue section because the most of customer is in Europe and USD currency will affect the supply side because all of material need to import from foreign country.

Table 4.3 THB against EUR AND USD

THB/EURO	2017	2018	2019	2020	2021
	38.28	38.15	34.75	35.68	37.81

THB/USD	2017	2018	2019	2020	2021
	33.94	32.31	31.05	31.29	31.98

Source: Bank of Thailand

We estimate the forward exarate in the next 5 year by using Forward Exchange rate calculation. By applying spot rate of each country as of up-to-date information multiple with the $1 + \text{Domestic Interbank Rate} / 1 + \text{Foreign interbank rate}$. The result can imply that the Thai Baht likely to depreciate relative to foreign currency.

The effect of exchange rate is 2 % of total revenue in this case because of the estimation from CAGR of next 5 year. (Table 4.2)

Table 4.4 Interbank Rate

	Interbank Rate	SPOT	Forward
USD	2.75%	33.515	34.69
EURO	0.00%	36.941	37.22
THAI	0.75%		

Source: Trading Economic

Table 4.5 Interbank Rate

	2021	2022	2023F	2024F	2025F	2026F	CAGR
USD Ex Rate	31.98	34.69	35.73	36.80	37.91	39.04	3%
EURO Ex Rate	37.81	37.22	38.34	39.49	40.67	41.89	2%

Source: Trading Economic

Therefore, the sale revenue will have CAGR 15% from 2021A – 2026F

4.2.2 Cost of sale projection

The raw material purchasing consist of copper foil, Copper Anode and Fiber glass which mainly direct effect from the variability of copper price and exchange rate. KCE it ‘self-assume that the copper price impact to yearly cost of raw material around 4.5%. Therefore, we are going to assume that the forecast of copper price and USD/THB exchange rate will impact on the forecast of cost of goods sold in KCE.

Table 4.6 Copper Price

		Y2021	
		Unit price	Volume
Copper Foil (KCE)	KG.	\$12.90	2,040,594
Copper Foil (TLM)	KG.	\$14.35	2,951,382
Copper Anode	KG.	\$9.68	2,034,000
Fiber glass	METRE	\$0.70	18,656,831

Source: (KCE Electronic, 2020)



Figure 4.8 Copper price trends

Source: Trading economic

The cooper rate mainly use from LME future exchange market whereas the NTM copper price is 5.08 USD/LBS and the actual price in 2021 is 4.68 USD/LBS. We estimate that the price in 2022 will significantly increase with touching 8.55%. The copper price in next 5 years may continue moving between boundary of of 4.5 – 5.5 USD/LBS because the demand of copper in semiconductor business will steady growth according to the variety demand of electronic and automotive product.

In additional, the cost of raw material mainly use USD for trading. The dollar will have significant role with cost of sale as well. Regarding to the table 4.3, the estimation trend of dollar is appreciated against Thai Baht with CAGR 3 %. We may interpret that the dollar costly effect 3 % with raw material cost of KCE.

Table 4.7 Cost of goods calculation

	2021 A	2022F	2023F	2024F	2025F	2026F
Cost of Good Sold	10,965.00	13,485.17	16,042.63	19,085.12	22,704.61	27,010.54
Copper Price / LBS	4.68	5.08	4.88	4.88	4.88	4.88
Copper Price Effect	4.50%	8.55%	5.00%	5.00%	5.00%	5.00%
Exrate Effect		3%	3%	3%	3%	3%

Source: Own calculation

4.2.3 SG&A expenses

Assume that the expense will have 20% of total revenue portion and it will increase around 5% consecutively. Because KCE proceeded a lot of expansion investment of their capacity which will require intensive of operation of selling.

4.2.4 Pro-Forma income statement

In overall, the total revenue will increase based on the demand of EU passenger car and the habit change of environmental concern from EU people stimulate the use of EV car. Cost of goods sold will increase slightly more than increase of revenue, but it caused from uncontrollable factor such a copper price and ex change rate which impact a lot to KCE cost of raw material. Total expense would increase as proportional as the increasing of human to capture expediting the market. Earnings before interest and tax trend to increase with CAGR 13%. The Net profit will increase as the same with EBIT since there is no change in the estimate of interest and tax. The earing per share improved a lot from 2.03 Baht per share to 4.30 per share with CAGR 13% in the end.

Table 4.8 Pro-Forma income statement 2021-2026,

KCE	2564 2021	2565F 2022F	2566F 2023F	2567F 2024F	2568F 2025F	2568F 2026F	CARG 2021-2026
TOTAL REVENUE	14,938.00	17,834	20,993	24,852	29,590	35,433	15%
COST OF SALES	10,965	13,485	16,043	19,085	22,705	27,011	16%
GROSS PROFIT	3,973	4,349	4,950	5,767	6,886	8,422	13%
Total Expense	12,621	14,981	17,634	20,876	24,856	29,764	15%
EBIT	2,708	2,854	3,359	3,976	4,734	5,669	13%
FINANCE COSTS	44	38.5	36.6	34.7	31.8	26.8	-8%
Profit Before Tax	2,656	2,815	3,322	3,942	4,703	5,642	13%
TAX	221.5	281.5	332.2	394.2	470.3	564.2	17%
Net PROFIT	2,434	2,534	2,990	3,548	4,232	5,078	13%
NUMBER OF SHARES (MN)	1,180	1,180	1,180	1,180	1,180	1,180	0%
EARNINGS PER SHARE (BT)	2.03	2.15	2.53	3.01	3.59	4.30	13%

Source: Own calculation

CHAPTER V

VALUATION OF KCE

5.1 Discount Cash Flow Valuation

The discount cash flow is the model or method to calculate the present value of the firm regarding to the projection of free cash flow. Basically, it's projection the company future earning which anticipate the company current value from all of cash flow generated from business activity. It can be representative of entire of company even a stock value.

5.1.1 WACC

The important factor to discount the generated cash flow of KCE because the concept of present value is discounting the future value into the recent value. In the other hand, WACC represent the average cost of capital to finance the business activity. The cost will be given by stock, bond, and various form of debt financing. It can be interpreted that if KCE have high WACC seem to confront with a high risk because KCE require to pay high cost to the investor which typically require high required rate of return from the company. WACC can be find from weighted cost of debt sum up with the weight cost of equity from below formula (Figure:5.1)

<p>WACC Formula and Calculation</p> $\text{WACC} = \left(\frac{E}{V} \times Re \right) + \left(\frac{D}{V} \times Rd \times (1 - Tc) \right)$ <p>where:</p> <p><i>E</i> = Market value of the firm's equity <i>D</i> = Market value of the firm's debt <i>V</i> = <i>E</i> + <i>D</i> <i>Re</i> = Cost of equity <i>Rd</i> = Cost of debt <i>Tc</i> = Corporate tax rate</p>

Figure 5.1 WACC

Cost of Debt

The cost of debt simply observes from Fitch rating that KCE stand in rank A- in this year (Figure:5.1). If KCE would issue the cooperate bond, they would pay a yield to investor 3% as a return.

Table 5.1 KCE Rating

Fitch Rating	Bond Yield
A-	3.00%

Source: Fitch ratings

There is another simply way by looking the historical interest expense to the total debt which describe how likely of cost being for KCE to borrow the money from financial institution. Cost of debt from short term debt and long-term debt is 1.49% (Table 5.2). In this case, we assume KCE will continue to use debt from the financial institution because the lower cost to afford the fund. Moreover, the weight cost of debt can be defined from the currently interest-bearing debt to equity portion of KCE at 27%. The interest payment normally be tax deductible. So, it required to multiple with (1-T) Totally cost of debt calculate from $27\% \times 1.48\% (1-T) = 0.3$

Table 5.2 KCE debt

	2021	2020	2019	2018	2017
Short-Term Debt	1,797.6	1,282.9	1,066.7	2,201.9	1,156.0
Long-Term Debt	1,125.8	679.7	731.1	664.4	1,771.4
Total Debt	2,923.4	1,962.7	1,797.8	2,866.3	2,927.4
Interest Expense	43.70	57.48	61.11	109.8	126.9
Interest Rate (Calculation)	1.49%	2.93%	3.40%	3.83%	4.33%

Source: Own calculation

Cost of Equity

The cost of equity commonly use Capital Pricing Model (CAPM) to generate which derived from the formula (Figure: 5.2). The expected return calculates from risk free plus with the risk of stock relative to the market and multiply with the market risk premium. The CAPM can imply cost to shareholders that to need to pay some return to the investor.

$$ER_i = R_f + \beta_i(ER_m - R_f)$$

where:
 ER_i = expected return of investment
 R_f = risk-free rate
 β_i = beta of the investment
 $(ER_m - R_f)$ = market risk premium

Figure: 5.2 CAPM formula

Risk Free Rate

The first element is 10 Year government bond yield is 2.49% (Figure 5.2). We select it because 10-year government bond yield is long enough to use and commonly use among various of financial analysis

TTM (Yrs.)	Yield (%)	TTM (Yrs.)	Yield (%)
0.08	0.467319	9.00	2.422541
0.25	0.486278	10.00	2.490884
0.50	0.504921	11.00	2.640499
1.00	0.528837	12.00	2.758333
2.00	0.876790	13.00	2.876168
3.00	1.203480	14.00	2.991597
4.00	1.381123	15.00	3.097884
5.00	1.609603	16.00	3.203440
6.00	1.883839	17.00	3.243756
7.00	2.164458	18.00	3.263346
8.00	2.328158	19.00	3.282937

Figure 5.3 Risk Free Rate,

Source: <https://www.thaibma.or.th/EN/Market/YieldCurve/Government.aspx>

Market Risk Premium

MRP simply calculate from the data of RM -RF from each stock exchange index which related to KCE business. Average the Risk premium of 3 country Germany, USA and Thailand, the result is 6.28% (Table 5.3)

Table 5.3 Market Risk Premium

Countries/Regions	Index	ERP E(Rm) - Rf %
Germany	DAX	6.80%
Thailand	SET	6.34%
United States	SP500	5.69%
Average ERP		6.28%

Source: Refinitive EIKON

BETA

Measurement of risk of stock relative to the Market. We calculate by use HAMADA equation (Table 5.4). The method use leverage BETA of each stock to find the unleveraged BETA and compute into the formula. We can get the BETA of target stock around 0.997.

Table 5.4 Peer Beta

	Unleverage Beta	Leverage Beta	TAX	Debt.Equity	Net debt (MB)	Equity (MB)
HANA	0.64	0.64	5%	0.04%	10.00	23,058.00
Delta	1.21	1.16	1.40%	5%	2,180.32	41,404.00
SVI	1.43	0.59	0.80%	84.92%	4,419.87	5,204.78
Peer Average	1.09	0.80	0.024	30%	2,203.40	23,222.26
KCE	1.09	0.997	8%	27.41%	3,668.00	13,380.00

Source: Refinitive EIKON

After all, take the derived number to compute in Capital Pricing Model (CAPM) formula, Risk Free + Beta (MRP) = 8.75%. To find the cost of equity, it needs to multiple with the weight of equity. The weight can be found from the equity/ (Equity + Net Debt) which is $13,8380 / 17,048 = 78\%$. Calculate the WACC as below.

Table 5.5 WACC calculation

WACC	7.127%
Cost of Debt	0.30%
ST and LT Loan	1.49%
Tax	8%
Debt / Equity	22%
Cost of Equity	6.83%
CAPM	8.75%
Weight	78%

Source: Own calculation

5.1.2 Terminal growth

In discount cash flow model, the terminal value is projection out of the cashflow projection period. It assumes that the business will face constant growth perpetuity after the projection period.

The market of KCE revenue mainly generate from Europe. So, the growth will be considered by many factors which relative to KCE's Business. First, The Automotive industry projected to long-term CAGR 3.71% (Yahoo Finance , 2021) because the development of new technology in passenger car require many units of PCB board. Focusing more narrow scope, the EU Vehicle growth is -0.36% (Statista, 2022) due to contraction of EU economic. By the way, the GDP growth also matter from driving of car production, the GDP of Europe has long term projection 2.70% (Ec.Europa, 2022). Finally, the inflation 2.49% (OECD, n.d.) of this zone also considered for calculation because it can see the real growth of Euro zone for KCE business. However, KCE is listed in the Thai stock exchange, it also matter to compare with the inflation and economic growth in Thailand. The range of terminal growth should between the GDP of region and inflation (Table 5.7). Since Thailand forecast inflation is 1.70% (BOT, 2022) The growth 2.14% (Table 5.6) is acceptable since it fall within the range between the country GDP and the inflation.

Table 5.6 Long Term Growth Forecast.

Long-term Growth	Forecast
Automotive Industry	3.71%
EU Vehicle Growth	-0.36%
GDP Europe Growth	2.70%
Inflation Growth EU + UK	2.49%
KCE Long-term Growth	2.14%

Table 5.7 Thailand Inflation and GDP forecast

Thailand Inflation	1.70%
Thailand GDP Growth	4.4%

Source: Bank of Thailand.

5.1.3 DCF Valuation Result

The valuation will be based on Free Cash Flow to firm method. It show about the cash flow from the operation after adjusting with depreciation, expense, tax, working capital and capital expenditure. The calculation come from EBIT projection (Figure 4.2.5) minus with Tax expense to get the Earnings before interest and Tax. In this case, we don't subtract the interest expense because we would like to evaluate the cash flow which generated to both equity and creditor. Therefore, it better to determine the free cash flow to firm method instead of free cash flow to equity method. When deduct with Tax, will be able to get the EBIT after tax.

Working Capital Projection

The free cash flow to firm regard as of working capital change. The change calculate from a pattern of historical current asset deduct with current liability. It can explain the capital use inside the company to generate the revenue. It mainly include Account Receivable, Inventory, and account payable. In this case, the CAGR of current asset and current liability expand 10 % together. We would continue assume that the portion will steady increase as 10% (Figure 5.1.3) as well because the capacity require more capital for circulating.

Table 5.8 Working Capital Projection 2017-2026

KCE	2560	2561	2562	2563	2564	2565F	2566F	2567F	2568F	2568F
	2017	2018	2019	2020	2021	2022F	2023F	2024F	2025F	2026F
Total Curent Asset	7,504.6	7,916.7	6,719.4	8,185.0	11,794.0	12,973	14,271	15,698	17,268	18,994
Totoal Current Liability	4,594.7	5,196.2	3,651.3	4,216.1	6,947.8	7,643	8,407	9,247	10,172	11,189
WORKING CAPITAL	2,909.9	2,720.5	3,068.1	3,968.9	4,846.2	5,331	5,864	6,450	7,095	7,805
WORKING CAPITAL CHANGE		(189)	348	901	877	485	533	586	645	710

Source: Own calculation

Depreciation and Capital expenditure projection

The Depreciation and Capital expenditure could be considered as a value related to the balance sheet such on Fixed asset. The estimation of depreciation calculated from the historical depreciation on 2021 dividend by historical fixed asset of KCE. We continue projected the depreciation will go as straight forward direction as 10% relative to the growth of Fixed asset projection. Capital Expenditure planned to cover the depreciation and new capacity expanding on fixed asset. In 2023, KCE have

plan to expand the new production in Rojana. Therefore, the forecast of CAPX increase to be around 2 billion Baht on 2023F and 2024F (Figure 5.1.4). After investment on factory capacity, KCE will slowdown the CAPX which remain only 1.5 billion to cover depreciation and other necessary expense on fix asset.

Table 5.9 Depreciation and Capital expenditure projection 2017-2026

	2560	2561	2562	2563	2564	2565F	2566F	2567F	2568F	2568F
	2017	2018	2019	2020	2021	2022F	2023F	2024F	2025F	2026F
DEPRECIATION	914.7	991.5	1014.9	1099.7	1027.2	1000.0	1100.0	1200.0	1230.0	1260.0
- Depreciation / Fixed	10%	11%	11%	14%	11%	10%	10%	10%	10%	10%
CAPEX	-1070.5	-741.5	-584.1	-321.7	-1723.7	-1700.0	-2000.0	-2100.0	-1500.0	-1500.0
FREE CASHFLOW	2288.6	1888.4	1619.0	2956.3	2889.1	2338.1	2892.0	3562.8	4379.5	5378.8
Fixed Asset	9,510.0	9,363.9	8,839.0	8,120.0	8,999.2	9,699	10,599	11,499	11,769	12,009

Source: Own calculation

DCF Calculation

The calculation of Discount Cashflow will be calculate on Figure 5.1.5 where the projection of each necessary element of free cash flow was entered. The key factory to determine the value of this model is Terminal value. It describe the cash flow generated beyond the forecast period and assume the company will grow with perpetual rate forever. The formula to determine the value: $[FCF \times (1 + g)] / (d - g)$ where FCF = Free Cash Flow, g = Terminal Growth rate and d = WACC or Discount Rate.

Table 5.10 DCF Calculation

PERIOD	1	2	3	4	5	Terminal Value
	2022F	2023F	2024F	2025F	2026F	
EBIT	2,854	3,359	3,976	4,734	5,669	
TAX	(280)	(331)	(394)	(471)	(567)	
EBIT AFTER TAX	2,574	3,028	3,582	4,264	5,103	
DEPRECIATION	1,000	1,100	1,200	1,230	1,260	
WORKING CAPITAL CHANGE	485	533	586	645	710	
CAPEX	(1,700)	(2,000)	(2,100)	(1,500)	(1,500)	
CASHFLOW TO THE FIRM	2,358	2,661	3,269	4,639	5,572	114,127
DISCOUNTED CASHFLOW	2,201	2,318	2,659	3,522	3,949	80,889.25

Source: Own calculation

The discount cashflow obtain from free cash flow to firm discounted with WACC 7.13% year by year including the terminal value as well. In order to compute the stock price, it need to divided present equity value with share outstanding which assume unchanged at 1180 million shares. The present equity value can identify from Enterprise Value (EV) deduct with the net debt of the firm. In this case, EV calculate from summation of discounted free cash flow and Net Debt derived from information from Year 2021, 3,669 million Baht. The present value of equity is 91,871 million Baht, dividend by 1,180 will get the result of stock price 77.86 Baht / Share.

Table 5.11 Share Price Calculation

Enterprise Value	95,539
NET DEBT	3668.8
EQUITY VALUE	91,871
No. OF SHARES (MN)	1180
Share Price	77.86

Source: Own calculation

5.1.4 Sensitivity Analysis

The Discount Cashflow mostly determine by 2 factor which is WACC (Cost of Debt, Cost of Equity) and the Terminal growth or perpetual growth rate. The variance on WACC and Terminal growth will meaningfully impact the stock price of the target firm because these 2 factors affect direct to the terminal value formula. We simply demonstrate by use What if analysis tools to see how change of the share price when the WACC and Terminal Growth deviated. The figure 5.12 show the movement of price if the 2 factors (WACC, Growth) change by 10%.

Table 5.12 Sensitivity

	Share Price	Terminal Growth							
	77.86	1.10%	1.50%	2.00%	2.14%	2.50%	3.00%	3.50%	4.00%
	4.43%	125.96	142.27	170.22	180.23	212.66	284.85	434.90	936.22
	4.87%	110.07	122.36	142.54	149.52	171.25	215.30	291.51	455.33
	5.36%	96.41	105.75	120.55	125.52	140.53	168.99	212.78	288.84
	5.89%	84.61	91.75	102.73	106.33	116.95	136.09	163.22	204.69
	6.48%	74.36	79.84	88.07	90.71	98.36	111.61	129.30	154.12
WACC	7.13%	65.41	69.64	75.84	77.81	83.39	92.77	104.72	120.50
	7.84%	57.57	60.84	65.55	67.02	71.14	77.89	86.19	96.65
	8.63%	50.68	53.21	56.80	57.91	60.98	65.90	71.77	78.92
	9.49%	44.61	46.57	49.31	50.15	52.45	56.07	60.30	65.29
	10.44%	39.24	40.76	42.86	43.50	45.23	47.92	51.00	54.55

Source: Own calculation

5.2 Valuation Recommendation

Table 5.13 Target Price Recommendation

Target Price	77.86
Current Price as of 31 Mar22	65.6

Criteria	Recommendation	Result
Target Price > Current Price + 10%	Buy	72.16
Current -10% > Target price < Current Price+ 10%	Hold	59.04 > 77.86 < 72.16
Target Price < Current Price - 10%	Sell	59.04

Source: Own calculation

The target price is 77.86 Baht/Share which higher than the current price 65.6 Baht. It's mean that now the stock is undervalued. The target price still beyond 10% of the current price (Table 5.13). That mean the market no realize the real value of KCE yet. We recommend **buy** it because based on concrete projection plan of KCE to expand the facility and capability to serve the world demand of electronic product both consumer and automotive.

The earning ability of KCE will truly reflect around the beginning of 2023. In this moment, the market only concern about the short-term issue such as the limited

supply of semiconductor material, the transportation cost, and the war between Ukrain and Russia which affect the potential growth of EU.



CHAPTER VI

INVESTMENT RISKS AND DOWNSIDE POSSIBILITIES

KCE is a PCBs producer and export worldwide so that the company needs to consider either internal and external factors elaborately to reduce and pretend the risks predictively so that there 5 factors to be considered to management investment and downside possibilities the risks effectively.

6.1 Industry Risk

- **Global PCB market**

Subsequently outbreak of Covid-19 pandemic in 2020, people are prohibited to live as a new normal life. The activities of people are reduced in global. Therefore, it impacted people to live privately for instance to work or study from home. So that the demand of all electronics devices and electrical equipment have been significantly increasing. People usually purchase those devices to serve their new normal life. Moreover, lifestyle changing has positive impact to the growth of PCB market size driven by demand for mobile devices such as smartphones, smartwatches, and other products including wireless technology to allow each device connected to each other easily such as smartphone connect to home application to turn on/off air conditioner, air purifier remotely. The global PCB market size is estimated approximately to reach from USD 70,920 mil. in 2020 to USD 86,170 mil. in 2026 at a CAGR of 3.3% during 2021 – 2026. Source: (Rocket-PCB, 2020),

- **Automotive PCB market**

Automotive electronics market, major factors that are fueling the growth of automotive PCB market size is raising integration of convenience, advanced safety, comfort, and infotainment system in cars such as Tesla Autopilot a safety self-driving with big screening in car for entertainment purposes and environment friendly with no carbon dioxide release from the car. The global automotive PCB market is valued at

USD 5,988.2 mil. in 2021 and is expected to reach USD 10,190.0 mil. by the end of 2026, growing at a CAGR of 7.8% during 2021 – 2026. There is clearly that PCBs are in trend and consider as low industry risk. Source: (Marketsandmarkets, n.d.), (Marketwatch, 2022)

6.2 Business Risk

Production and Technology Risk – Medium Risk

- **Advanced technology required:**

Currently, electronic devices are smaller than previously since technology developed to be smarter and more functions so that PCBs itself need to be provided more complexity, complicated and new designed. KCE reduced the risk by imported new machineries to be able to support new technologies, implementing automatic machines with AI to reduce waste of production and shorten process of line production.

- **Skilled labor required:**

KCE Group has total employee approximately 4,982 people, 90% work in manufacturer. The manufacture was closed twice times in 2019 and 2020 due to factory work addicted to Covid-19 this situation reflected that skilled labor are very important. KCE Group attended to reduce the risk by providing training courses to create and maintain skilled labor, including organized PCBs school to provide knowledge and set up Coach & Mentoring to employees in each production process. Source: (KCE Electronic, 2020)

Customer Risk – Medium Risk

- **Customer concentration**

KCE Group has a policy to reduce customer concentration by capturing revenue generating from five largest customers not higher than 50% of total revenue. KCE successfully to reduce customer concentration from 65% in 2010 to 50% in 2020.

- **Efficient AR**

Average Receivables Collection Days improved from 102 days in 2017 to 97 days in 2020 faster AR is better performance. Source: (KCE Electronic, 2020)

Supplier Risk – Medium Risk

Raw materials are mostly supplied from Thai Laminate Manufacturer Co., Ltd. (TLM) a subsidiary company of KCE and was founded as a backward integration to support the group companies so that KCE can protect the risk of raw material shortage. Moreover in 2012, KCE entered a joint venture 49% to establish KCE Taiwan Co., Ltd. as an oversea supplier representative for raw material and machinery to KCE. KCE normally sign the contract with other suppliers to supply raw material to guarantee prices and qualities on yearly tenor to ensure that KCE will receive raw material on demand and sufficient to fully produce of capacity. Source: (KCE Electronic, 2020)

FX Risk – Medium Risk

Foreign Currencies risk is considered as significant risk since main revenue from Foreign Currencies while cost in Thai baht. KCE reduce fluctuation of exchange rates by buying forward contract to mitigate the risk of exchange rate fluctuation. Source: (KCE Electronic, 2020)



CHAPTER VII

CONCLUSION

This Thematic Paper is particularly intention to evaluate KCE Electronics Public Company Limited or KCE ticker in The Stock Exchange of Thailand (SET). This paper uses DCF Valuation method to study and analyze the intrinsic value and determine appropriate target price. There are many assumptions to be considered such as company earning (EBIT), Cost of debt, Cost of equity and perpetual growth and Free cash flow projection to calculate the target price in the paper.

With the DCF estimation, it use projection of cashflow 2022-2026 and calculate with assumption that KCE will grow at terminal rate 2.14% and assumption of using combine of cost of equity and cost of debt or the weight cost of capital at 7.127%. The result from the calculation can get the appropriate price equal to THB 77.86 per share compared to the recent price as of 31 Mar 2022 is equal to THB 65.60 per share means that the current price is trading undervalued around 18%. Thus, we would recommend Buying KCE stock. Furthermore, the paper also illustrate the sensitivity analysis according with deviation 10% of WACC and Terminal growth which strongly impact to the target price changing. The fundamental increasing of WACC will lead the decreasing in price and increasing of terminal growth will impact increasing the price. The sensitivity analysis can identify the possible price range THB83.74 - THB 158.41 when each factor step in some direction 10 %.

The “triggers for re-assessment”, the DCF method is dependent on many of assumption and sometime difficult to proof the reliability and accuracy of assumption. There are the concerning point that could be reconsidered.

1.Terminal Growth Rate

Terminal growth relatively tricky to predict because it relate with the forecast GDP growth of target market and the forecast of inflation rate in each country. The prediction information may fluctuate easily depend on the global economic situation and stability of government and may need to be re-evaluate year by year. We

must forecast the real growth to be consistency because this value crucial impact on the value of the target firm. If the value is too high, it will very exaggerate the price of target firm. Therefore, the assumption require to be re asses when the situation has changed.

2.WACC

The assumption of capital in the firm is to choose the structure of capital to be circulate or reinvest within the firm. CAPM depend on the many depend variable as same as the risk free and interest policy. If these factors change, there need to be re assessment the discount value again.

3.Cash Flow Projection

The cash flow projection is the beginning of DCF valuation since it will be able to compute the discounted cashflow prior to sum up for enterprise value. The assumption strongly based on sale forecast projection because it a source of EBIT in the forecast. It need to ensure that the assumption of sale expanding are appropriate or not. If there are other alternative sale projection assumption. The calculate be required to re assessment as well.

There are “limitations of this valuation”, the DCF valuation is seriously rely on the forecast which hardly to define correctly from the outsider. The subjective point of view somehow affect inaccuracy of the forecast and the overall of valuation. If one assumption is not accurate, the valuation will get the largely differ from the real value. Furthermore, the DCF doesn't take the peer and market valuation into the account. The comparable DCF valuation does not allow in this method. As a result, the expectation from DCF valuation for short term investment may be inefficient because the DCF only assume the internal capability of target company itself. If the assumption is accurate enough. The discount model would be appropriate. If not, the relative valuation will be more proper to determine the value

REFERENCES

- Acea. (2022, February 17). *Acea*. Retrieved from <https://www.acea.auto/>:
<https://www.acea.auto/pc-registrations/passenger-car-registrations-6-0-in-january-2022/>
- Analysis, B. o. (2022, April 5). *Bureau of Economic Analysis* . Retrieved from <https://www.bea.gov/>: <https://www.bea.gov/news/2022/us-international-trade-goods-and-services-february-2022>
- Bob, B. (2020, July 21). Retrieved from www.printedcircuits.com:
<https://www.printedcircuits.com/blog/history-of-pcbs/>
- BOT. (2022, April). *BOT*. Retrieved from <https://www.bot.or.th/English/MonetaryPolicy/MonetPolicyCommittee/MPR/Pages/default.aspx>
- Chin-Poon. (n.d.). Retrieved from <http://www.chinpoon.com/en>
- CHRIS, T. (2018). Retrieved from <https://www.goodcarbadcar.net>:
<https://www.goodcarbadcar.net/usa-auto-industry-total-sales-figures/>
- Commission, E. (2022, February 10). Retrieved from <https://ec.europa.eu/>:
https://ec.europa.eu/commission/presscorner/detail/en/ip_22_926
- DELTA. (n.d.). Retrieved from <https://deltathailand.com/en/>
- Ec.Europa. (2022, Feb). *Europa*. Retrieved from https://ec.europa.eu/commission/presscorner/detail/en/ip_22_926
- Economics, T. (2022, April). Retrieved from Trading Economics :
<https://tradingeconomics.com/commodity/copper>
- Economics, T. (2022, April). Retrieved from Trading Economics:
<https://tradingeconomics.com/commodity/copper>
- ELISSA, S. (2022, March 18). Retrieved from <https://thenationaldesk.com/>:
<https://thenationaldesk.com/news/americas-news-now/the-fed-raised-interest-rates-025-but-is-it-enough-federal-reserve-steve-moore-inflation-recession->

REFERENCES (cont.)

- economy#:~:text=The%20Fed%20approved%20a%200.25,increase%20over%20the%20past%20year.
- HANA. (n.d.). Retrieved from HANA: <https://www.hanagroup.com/home.php?lang=en>
- House, T. W. (2021, October 24). Retrieved from <https://www.whitehouse.gov/https://www.whitehouse.gov/build-back-better/>
- IMF. (2022, January). *WORLD ECONOMIC OUTLOOK UPDATE 2022*. Retrieved from <https://www.imf.org/en/Home:https://www.imf.org/en/Publications/WEO/Issues/2022/01/25/world-economic-outlook-update-january-2022>
- KCE Electronic. (2020, March 24). *KCE Annual Report 2020*. Retrieved from investor.kce.co.th: <https://investor.kce.co.th/en/download/annual-report>
- Knoema. (2021, April 9). Retrieved from <https://knoema.com/:https://knoema.com/infographics/prujshc/copper-price-forecast-2021-2022-and-long-term-to-2035>
- Marketsandmarkets. (n.d.). Retrieved from www.marketsandmarkets:https://www.marketsandmarkets.com/Market-Reports/automotive-pcb-market-12448564.html
- Marketwatch. (2022, February 24). Retrieved from <https://www.marketwatch.com:https://www.marketwatch.com/press-release/printed-circuit-board-pcb-market-size-2022-application-and-future-forecast-by-2027-2022-02-24>
- OECD. (n.d.). *OECD*. Retrieved from <https://data.oecd.org/price/inflation-forecast.htm>
- Patricia, C. (2022, January 25). Retrieved from <https://www.nytimes.com/:https://www.nytimes.com/2022/01/25/business/imf-world-economic-report.html>
- Paul, E. (2012). Retrieved from Wikipedia: https://en.wikipedia.org/wiki/Paul_Eisler;https://en.wikipedia.org/wiki/Printed_circuit_board
- Research, P. M. (2018, November). *polarismarketresearch*. Retrieved from <https://www.polarismarketresearch.com/>

REFERENCES (cont.)

- <https://www.polarismarketresearch.com/industry-analysis/automotive-pcb-market>
 Rocket-PCB. (2020, May 26). Retrieved from <https://www.rocket-pcb.com:https://www.rocket-pcb.com/top-50-pcb-companies-in-the-world>
- SANTOSH, D. (2021, September 1). Retrieved from <http://www.electronicandyou.com:http://www.electronicandyou.com/blog/types-of-pcb-different-types-of-printed-circuit-board-pcb.html#:~:text=Different%20Types%20of%20PCB%3A,-Single%20Sided%20PCB&text=Single%20Layer%20PCB-,Double%20Sided%20PCB%20or%20Double%20Layer%20PCB,Rigid%20PCB>
- Statista. (2022, Jan). *Statista*. Retrieved from <https://www.statista.com/outlook/mmo/passenger-cars/europe>
- Statista. (2022, Jan). *www.statista.com*. Retrieved from www.statista.com:https://www.statista.com/outlook/mmo/passenger-cars/europe
- SVI. (n.d.). Retrieved from <https://investor-th.svi-hq.com/factsheet.html>
- Thaibma. (n.d.). Retrieved from <https://www.thaibma.or.th/EN/Market/YieldCurve/Government.aspx>
- Unimicron. (n.d.). Retrieved from <https://www.unimicron.com/en/>
- Yahoo Finance . (2021). *Yahoo Finance* . Retrieved from Yahoo: <https://finance.yahoo.com/news/global-automotive-market-covid-19-085900566.html>