PROFIT EFFICIENCY AND ECONOMIC VALUE ADDED OF EXTENDED VALUE CHAIN ACTIVITIES IN MALAYSIAN PLANTATION COMPANIES

By

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Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

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DEDICATION

This thesis is dedicated to:

My beloved husband

ABDUL SYUKOR BIN ABDUL HALIM

…….. Thank you for understanding, encouragement, love, and support throughout this work

My lovely kids

MUHAMMAD AFEEF, NUR RAISHA, AND NUR SOFEA

Thank you so much for the sacrifices you have made for me, my sweethearts

My parents

HASNAH BINTI DUN AND WAN AZIZI BIN WAN ISMAIL

For their endless love and support all through my life

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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June 2021

Chairman : Professor Shaufique Fahmi Ahmad Siddique, PhD
School : Business and Economics

Palm oil industry in Malaysia is the main driver of Malaysia's agricultural sector due to the significant contribution of this industry towards the Malaysian economy. High demand and attractive earnings of palm oil have attracted high participation in this industry. However, lower palm oil prices have affected the performance of the industry, where, in 2018, the total export revenue of this industry declined sharply by 13.3 percent to RM67.49 billion as compared to the RM77.81 billion in 2017 due to lower global palm oil prices. The decline in palm oil export revenue is reflected in decreasing profits of plantation companies since they are mainly export-oriented with the total profits of 44 plantation companies declining from 53.43 percent in 2017 to 34.25 percent in 2018. This disparity begs the questions as to the ability the plantation companies which is brings to the relevant indicators have includes efficiency and economic value added of plantation companies which provides as the benchmark for performance analysis.

Therefore, this study's general objective is to investigate whether extending the value chain activities in plantation companies will improve the profit efficiency and economic value added. In order to attain this objective, this study focus on three important objectives; (i) to assess the profit efficiency of plantation companies involving a different value chain activities; (ii) to investigate inefficiency factors that influence the profit efficiency of plantation companies involving a different value chain activities; (iii) to examine the economic value added and the factors that influence the economic value added of plantation companies involving a different value chain activities. Two methodologies are employed namely Stochastic Frontier Analysis (SFA) and dynamic generalized method of moments (DGMM). The study took a sample of 40 Malaysian plantation companies that listed in Bursa Malaysia. For this study, to achieve the first and second objectives, the sample period spanned 19 years, annually from 2000 to 2018, and for the third objective, the sample period spanned 9 years, from 2010 to 2018.

For the first objective, the empirical results indicate that the mean profit efficiency for plantation companies is 60.3 percent. According to the findings, plantation companies' profit efficiency could be increased by 39.7 percent by improving technical, allocative, and scale efficiency. Based on groups, the downstream integrated plantation companies recorded the highest profit efficiency (76.6 percent) than the pure upstream plantation companies (54.2 percent). For the second objective, the value chain activities show significant results in influencing the plantation companies profit efficiency. It is found that the oleochemicals/ biodiesel activities give the highest coefficient, -0.573, followed by plantation activities which is, -0.571, and refineries activities, -0.266. However, other factors, such as ownership, firm's age, exchange rate, and crude palm oil price, except for mills activities, also significant influence the plantation companies profit efficiency. The empirical analysis for the third objective based on economic value added shows that both downstream integrated activities, namely oleochemicals/ biodiesel and refineries activities are significant influence the plantation companies economic value added, with the coefficient value 1.12 and 0.09 respectively. Other factors such as gross margin, crude palm oil price, and exchange rate also significant influence the plantation companies economic value added.

The empirical results based on plantation companies profit efficiency and economic value added are influenced by different value chain activities, as expected. The findings show that the downstream integrated activities like refineries, and oleochemicals/ biodiesel activities play a significant role in increasing the profit efficiency and economic value added of plantation companies. It is also worth noting that, while the percentage of these two activities is not particularly significant, when the number of companies involved in these two types of activities is considered, it is discovered that plantation companies involved in oleochemicals/biodiesel activities are fewer (seven companies) than companies involved in activities (40 companies). As all 40 plantation companies have their own oil palm plantation areas, it is not impossible that plantation activities have a relatively high percentage. These findings revealed that, despite the fact that only a small number of companies were involved in oleochemicals/biodiesel activities, they had the greatest impact on the profit efficiency and economic value added of plantation companies. Plantation companies have consistently played a significant role in Malaysia in the context of economy. From the findings, several recommendations are given to assist plantation companies to enhance their profit as well economic value added. Based on this study, the government, palm oil industry organisations such as Malaysian Palm Oil Board are called for in order to endeavors to encourage the upstream plantation companies ventures in downstream value chain activities by providing more incentives, reducing taxes, and ensuring a more conducive business environment with less bureaucracy.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

KECEKAPAN KEUNTUNGAN DAN NILAI TAMBAH EKONOMI DARI PERLANJUTAN RANTAIAN NILAI KE ATAS SYARIKAT PERLADANGAN KELAPA SAWIT DI MALAYSIA

Oleh

WAN NOOR ELANI BINTI WAN AZIZI

Jun 2021

Pengerusi : Professor Shaufique Fahmi Ahmad Siddique, PhD
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Industri kelapa sawit di Malaysia adalah pemacu utama sektor pertanian Malaysia kerana sumbangan besar industri ini terhadap ekonomi Malaysia. Permintaan yang tinggi dan pendapatan yang menguntungkan dari minyak sawit telah menarik kepada kemasukan yang tinggi dalam industri ini. Bagaimanapun, harga minyak sawit yang lebih rendah telah menjejaskan prestasi industri, di mana, pada tahun 2018, jumlah hasil eksport industri ini merosot secara mendadak sebanyak 13.3 peratus kepada RM67.49 bilion berbanding RM77.81 bilion pada 2017 disebabkan oleh penurunan global harga minyak sawit. Kemerosotan dalam hasil eksport minyak sawit dicerminkan melalui penurunan keuntungan syarikat perladangan kerana mereka berorientasikan eksport terutamanya dengan jumlah keuntungan 44 syarikat perladangan merosot daripada 53.43 peratus pada 2017 kepada 34.25 peratus pada 2018. Perbezaan ini menimbulkan persoalan mengenai kebolehan syarikat perladangan yang membawa kepada petunjuk yang relevan termasuk kecekapan dan nilai tambah ekonomi syarikat perladangan yang menjadi penanda aras untuk analisis prestasi.

Oleh itu, objektif umum kajian ini adalah untuk menkaji sama ada dengan melanjutkan aktiviti rantaian nilai dalam syarikat perladangan akan meningkatkan kecekapan keuntungan dan nilai tambah ekonomi. Bagi mencapai objektif ini, kajian ini memfokuskan kepada tiga objektif penting; (i) untuk menilai kecekapan keuntungan syarikat perladangan yang melibatkan aktiviti rantaian nilai yang berbeza; (ii) untuk mengenalpasti faktor ketidakcekapan yang mempengaruhi kecekapan keuntungan syarikat perladangan yang melibatkan aktiviti rantaian nilai yang berbeza; (iii) untuk mengkaji nilai tambah ekonomi dan faktor-faktor yang mempengaruhi nilai tambah ekonomi syarikat perladangan yang melibatkan aktiviti rantaian nilai yang berbeza. Dua metodologi digunakan iaitu *Stochastic Frontier Analysis (SFA)* dan dinamik panel momen teritlak (GMM). Sampel kajian ini melbatkan 40 buah syarikat perladangan Malaysia yang tersenarai di Bursa Malaysia. Bagi kajian ini, untuk mencapai objektif pertama dan kedua, tempoh sampel menjangkau 19 tahun, bermula dari tahun 2000

hingga 2018, dan untuk objektif ketiga, tempoh sampel menjangkau 9 tahun, dari 2010 hingga 2018.

Bagi objektif pertama, keputusan empirikal menunjukkan bahawa kecekapan keuntungan purata bagi syarikat perladangan ialah 60.3 peratus. Berdasarkan kepada keputusan ini, kecekapan keuntungan syarikat perladangan boleh ditingkatkan sebanyak 39.7 peratus dengan menambah baik kecekapan teknikal, alokatif dan skala. Berdasarkan kepada kumpulan, syarikat perladangan bersepadu hiliran mencatatkan kecekapan keuntungan tertinggi (76.6 peratus) berbanding syarikat perladangan huluan tulen (54.2 peratus). Bagi objektif kedua, aktiviti rantaian nilai menunjukkan hasil yang ketara dalam mempengaruhi kecekapan keuntungan syarikat perladangan. Didapati aktiviti oleokimia/biodiesel memberikan nilai tertinggi, -0.573, diikuti dengan aktiviti perladangan iaitu, -0.571, dan aktiviti penapisan, -0.266. Walau bagaimanapun, faktor-faktor lain, seperti pemilikan, umur firma, kadar pertukaran, dan harga minyak sawit mentah, kecuali aktiviti kilang, juga mempengaruhi kecekapan keuntungan syarikat perladangan. Analisis empirikal bagi objektif ketiga berdasarkan nilai tambah ekonomi menunjukkan bahawa kedua-dua aktiviti bersepadu hiliran, aktiviti oleokimia/biodiesel dan penapisan adalah signifikan mempengaruhi nilai tambah ekonomi syarikat perladangan, dengan nilai pekali masing-masing, 1.12 dan 0.09. Faktor-faktor lain seperti margin kasar, harga minyak sawit mentah, dan kadar pertukaran juga mempengaruhi nilai tambah ekonomi syarikat perladangan.

Keputusan empirikal berdasarkan kecekapan keuntungan syarikat perladangan dan nilai tambah ekonomi dipengaruhi oleh aktiviti rantaian nilai yang berbeza, seperti yang dijangkakan. Penemuan menunjukkan bahawa aktiviti bersepadu hiliran, penapisan, dan aktiviti oleokimia/biodiesel memainkan peranan penting dalam meningkatkan kecekapan keuntungan dan nilai tambah ekonomi syarikat perladangan. Perlu diingat juga bahawa, walaupun peratusan kedua-dua aktiviti ini tidak begitu ketara, apabila bilangan syarikat yang terlibat dalam kedua-dua jenis aktiviti ini dipertimbangkan, didapati bahawa syarikat perladangan yang terlibat dalam aktiviti oleokimia/biodiesel adalah lebih sedikit (tujuh syarikat) daripada syarikat yang terlibat dalam aktiviti (40 syarikat). Memandangkan kesemua 40 syarikat perladangan mempunyai kawasan ladang kelapa sawit sendiri, tidak mustahil aktiviti perladangan mempunyai peratusan yang agak tinggi. Penemuan ini mendedahkan bahawa, walaupun hanya sebilangan kecil syarikat yang terlibat dalam aktiviti oleokimia/biodiesel, mereka mempunyai kesan yang paling besar terhadap kecekapan keuntungan dan nilai tambah ekonomi syarikat perladangan. Syarikat perladangan secara konsisten memainkan peranan penting di Malaysia dalam konteks ekonomi. Daripada penemuan itu, beberapa cadangan diberikan untuk membantu syarikat perladangan meningkatkan keuntungan mereka serta nilai tambah ekonomi. Berdasarkan kajian ini, kerajaan, dan organisasi industri minyak sawit seperti Lembaga Minyak Sawit Malaysia diseru dalam usaha untuk menggalakkan syarikat perladangan huluan menceburi aktiviti rantaian nilai hiliran dengan menyediakan lebih banyak insentif, mengurangkan cukai dan memastikan lebih kondusif. persekitaran perniagaan yang kurang birokrasi.

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LIST OF ABBREVIATIONS

AE	Allocative Efficiency
APE	Alternative Profit Efficiency
BM	Bursa Malaysia
CAPM	Capital Asset Pricing Model
EVA	Economic Value Added
Cd	Cost of Debt
Ce	Cost of equity
CE	Cost efficiency
CPO	Crude Palm Oil
CPOP	Crude Palm Oil Price
DEA	Data Envelopment Analysis
EBIT	Earnings before Interest and Taxes
EE	Economic Efficiency
EPP	Entry Point Project
EPS	Earnings per Share
ER	Exchange Rate
ETP	Economic Transformation Programme
EVA	Economic Value Added
FFA	Free Fatty Acid
FFB	Fresh Fruit Bunches
GDP	Gross Domestic Product
GM	Gross Margin
GMM	Generalised Method of Moments
Ha	Hectares

IC	Invested Capital
IMP	Industrial Malaysia Planning
i.i.d	Independent and Identically Distributed
KPO	Kernel Palm Oil
LR	Likelihood Ratio
Mil/ha	Million hectares
MLE	Maximum Likelihood Estimates
MPOB	Malaysian Palm Oil Board
MV	Market Value
NBD	Neutralised, Bleached, and Deodorised
NKEAs	New Key Economic Areas
NOPAT	Net Operating Profit after Tax
PE	Profit Efficiency
PFAD	Palm Fatty Acid Distillate
PKO	Palm kernel oil
POME	Palm Oil Mill Effluent
PU	Pure Upstream
RBD	Refined, bleached, and Deodorised
RE	Revenue Efficiency
Rf	Risk free rate
ROA	Return on Asset
ROE	Return on Equity
ROIC	Return on Invested Capital
RPO	Refined Palm Oil
SC	Supply Chain
SFA	Stochastic Frontier Analysis

SLDB (Sabah)	Sabah Land Development Board
SLDB (Sarawak)	Sarawak Land Development Board
SPE	Standard Profit Efficiency
S1	First stage Processing (Mills)
S2	Second Stage Processing (Refinery)
S3	Third Stage Processing (Oleochemicals/ Biodiesel)
TE	Technical Efficiency
VC	Value Chain
WACC	Weighted Average Cost of Capital

CHAPTER 1

INTRODUCTION

The first section of this chapter reviews a brief introduction of agricultural sector in Malaysia. Section two then explain the palm oil industry in Malaysia, it's contribution as well the plantation companies in Malaysia. The introduction of value chain and palm oil value chain activities among palm oil plantation companies in Malaysia is shown in section three. Issues and problem statement of this study is highlights in section four and five whereas section six and seven present the research questions and research objectives of this study. Section six explain the significance of the study, section seven present the scope of the study and lastly section eight highlights the organisation of this study.

1.1 Overview of Agricultural Sector in Malaysia

Malaysia has a diversified economic structure that consists of services, manufacturing, mining, and quarrying, agriculture, and construction. Before Malaysia's independence in 1957 (previously known as Malaya), the agriculture sector was one of the main economic activities. In Malaysia, the agricultural sector is the foundation of the country's economy. Historically, agriculture has played a major role in the development of human civilization, with a large portion of the world's population being engaged in agriculture. Malaysia's agricultural sector has developed rapidly since its independence. During those early days, the agriculture sector, mainly rubber and timber products contributed more than 50 percent of the country's gross domestic products (GDP). Later diversification efforts saw the successful establishment of oil palm and cocoa plantations.

However, aggressive industrialization and expansion in the service sector starting in the mid-1970s had resulted in accelerated growth of these sectors. Starting from the late 1980s, the growth of agriculture and its contribution started to decline, slowing down from 7.0 percent in the 1960s to just 4.1 percent in the 1980s. In 1987, the manufacturing sector overtook agriculture to become the leading sector of the economy, where the manufacturing sector's contribution to GDP rose to 22.6 percent, surpassing the agricultural contribution of 21.7 percent. Since then, the contribution of the agricultural sector to Malaysia's economy steadily declined.

The drive towards industrialization in the mid-1980s to 1990s has left the agricultural sector in the back seat of the economy (refer Table 1.1). During this period, the Malaysian government policy were biased against agriculture (Ahmad and Suntharalingam, 2009). This changed after the Asian financial crisis of 1997/1998, when the government rediscovered the importance of the agricultural sector. Although the agriculture sector's contribution is still relatively small compared to other sectors, this sector remains vital to the Malaysian economy. It is a significant contributor to the national income due to its role as a supplier of food creator of employment opportunities. The Malaysian government's commitment to agriculture is proven by the budget

allocated for this sector being increased from RM3.8 billion in 2012 to RM6.2 billion in 2018.

Table 1.1: Gross Domestic Product (GDP) by Kind of Economic Activity in Malaysia at constant 2015 prices (RM, Mil), 1990-2018

Year	Sector		
	Agriculture	**Manufacturing**	**Service**
1990	47,597	71,665	136,452
1991	47,553	81,697	151,962
1992	50,815	87,417	169,540
1993	49,220	100,163	193,430
1994	48,287	111,557	212,941
1995	47,064	124,229	234,707
1996	49,198	146,814	255,646
1997	49,528	161,667	280,948
1998	48,158	139,972	279,821
1999	48,389	156,310	292,306
2000	51,321	184,938	311,872
2001	51,015	174,072	330,534
2002	52,426	181,552	351,909
2003	55,300	197,150	368,379
2004	58,044	216,541	394,103
2005	59,472	227,491	419,573
2006	61,453	239,861	402,771
2007	62,229	246,549	444,022
2008	64,915	249,517	477,707
2009	65,335	226,218	492,332
2010	82,882	192,493	420,382
2011	88,555	202,960	449,853
2012	89,406	211,921	479,299
2013	91,181	219,152	507,792
2014	93,048	232,527	541,411
2015	94,396	243,703	569,865
2016	89,509	254,472	602,261
2017	95,968	269,804	639,994
2018	95,545	283,337	683,080

(Source: Selected Agricultural Indicators, Malaysia, 2016-2019, Department of Statistics Malaysia)

Under the Third National Agricultural Policy, NAP 3, (1998-2010), the Malaysian government has strived to maximize the country's income through the optimal use of resources in the agricultural sector. However, it would be very difficult to simultaneously develop all of the subsectors in the agricultural sector as it requires a large financial allocation. Hirschman (1958) as cited in Ariff, Darawi, and Mamat (2012), stated that governments should only focus on specific sub-sectors that have strong links with industry so that will help enhance the development of related sectors. Thus, by identifying the main agricultural sub-sectors, the national income will be increased. As shown in Table 1.2, there are three main sub-sectors in agricultural sector as identified by the Malaysian government: (i) crops (palm oil, rubber, forestry, and logging, and other agriculture (ii) livestock (iii) fisheries.

Table 1.2: Percentage Share of Gross Domestic Product (GDP) for Malaysian Agricultural Sector at Constant 2015 price (%), 2015-2018

Economic Activity	2015	2016	2017	2018
Palm Oil	46.9	43.1	46.6	37.9
Rubber	7.2	7.1	7.3	2.8
Forestry and Logging	6.9	7.2	5.6	6.9
Livestock	10.7	11.6	11.4	14.9
Fisheries	10.7	11.5	10.5	12.5
Other Agricultural	17.7	19.5	18.6	25.1

(Source: Selected Agricultural Indicators, Malaysia, 2016-2019, Department of Statistics Malaysia)

From these three sub-sectors, palm oil recorded the highest contribution to agricultural GDP compared to other sub-sectors, even though the GDP of palm oil shows a decline from 2015 to 2018. In 2018, Malaysia's agriculture sector recorded a RM56.9 billion or 4.0 percent growth of GDP. As revealed in Table 1.2, the agriculture sector contributed 7.3 percent (RM99.5 billion) to the GDP. From Table 1.2 the crop sub-sectors recorded a higher contribution to the agriculture's GDP, which was 72.6 percent, and the highest contributing crop was oil palm (37.9 percent).

1.2 Overview of Malaysia's Palm Oil Industry

The agricultural sector in Malaysia is led by the plantation sub-sector. As aforementioned, the palm oil industry is the highest contributor to the agricultural sector. Basiron (2007) stated that the palm oil industry is the backbone of Malaysia's agricultural economy and plays a vital role in the agricultural and economic development of the country. Moreover, this industry continues to contribute significantly to Malaysian GDP, gross national income (GNI), foreign exchange, and employment.

In 2018, as stated by the Malaysian Palm Oil Board (MPOB, 2019), Malaysia has accounted for 39 percent of the world's palm oil production and 44 percent of the world's largest export, bringing Malaysia to become the second-largest producer exporter of

palm oil in the world after Indonesia[1]. The palm oil industry in Malaysia started about 100 years ago and until today, the palm oil sector has made a significant contribution to the growth of the Malaysian economy and has become an essential product that has changed the agricultural scenario in Malaysia. It was first introduced to Malaya as a commercial plant in 1917 at the Tennamaram Estate in Selangor, which effectively laid the foundation for the development of the palm oil industry in Malaysia. From a humble beginning in 1960, the Malaysian palm oil industry has transformed to become one of the key contributors to the Malaysia's economic development.

Due to the importance of this crop, the palm oil planted area had expanded phenomenally from a mere 568,561 hectares in 1975 to 5.85 million hectares in 2018. The yearly expansion of the oil palm planted area is one of the proofs of this industry's enormous growth. Palm oil cultivation in Malaysia has increased rapidly due to the conversion of other crops, such as rubber, and large-scale cultivation by federal and state governments in new land areas[2]. In recent years, most of the expansion took place in Sabah and Sarawak due to declining availability of suitable land in Peninsular Malaysia. Sarawak remained as the largest oil palm planted state, with 1.57 million hectares or 26.9 percent of the total Malaysian oil palm planted area, followed by Sabah with 1.55 million hectares or 26.5 percent and Peninsular Malaysia with 2.73 million hectares or 46.6 percent (refer to Table 1.3).

Table 1.3: Oil Palm Planted Area in Malaysia from 1975 to 2019

Year	Oil Palm Planted Area (Hectares)			
	Peninsular Malaysia	**Sabah**	**Sarawak**	**Total**
1975	568,561	59,139	14,091	641,791
1980	906,590	93,967	22,749	1,023,306
1990	1,698,498	276,171	54,795	2,029,464
2000	2,045,500	1,000,777	330,387	3,376,664
2005	2,298,608	1,209,368	543,398	4,051,374
2010	2,524,672	1,409,676	919,418	4,855,776
2011	2,546,760	1,431,762	1,021,587	5,002,120
2012	2,558,103	1,442,588	1,076,238	5,078,941
2013	2,593,733	1,475,108	1,160,898	5,231,752
2014	2,617,334	1,511,510	1,263,391	5,394,249
2015	2,659,361	1,544,223	1,439,359	5,644,958
2016	2,679,502	1,551,714	1,506,769	5,740,001
2017	2,708,413	1,546,904	1,555,828	5,813,162
2018	2,727,608	1,549,245	1,572,477	5,851,348

(Source: MPOB, 2019)

[1] Malaysia was the largest palm oil producer and exporter in the world in 1960s until 2005 before having been surpassed by Indonesia in 2006.

[2] This happened when the government undertook the agricultural diversification program in the 1960s in order to reduce the country's economic dependence on rubber and tin.

In tandem with the area expansion, the production of palm oil also grew significantly over 58 years. Based on Figure 1.1, in 1960, Malaysia produced only about 91,793 tonnes of crude palm oil (CPO) and increased to 431,069 tonnes in 1970. Output continued to increase rapidly to 2.6 million tonnes in 1980 and 6.1 million tonnes in 1990. However, in 1998, for the first time since 1960, the production of CPO dropped to 8.3 million tonnes from 9.1 million tonnes in 1997 due to the Asian currency crisis in 1997, resulting in a deflated demand for industrial products. Later, the production of CPO started to increase again in 1999 at 10.6 million tonnes before experiencing a recurrent drop in 2007 and at this point began an inconsistent trend in CPO production. In 2018, CPO production declined by 2.0 percent, to 19.52 million tonnes as against 19.92 million tonnes recorded in 2017. The decrease was due to lower fresh fruit bunches (FFB) processed, down by 3.2 percent arising from lower FFB yield (MPOB, 2019).

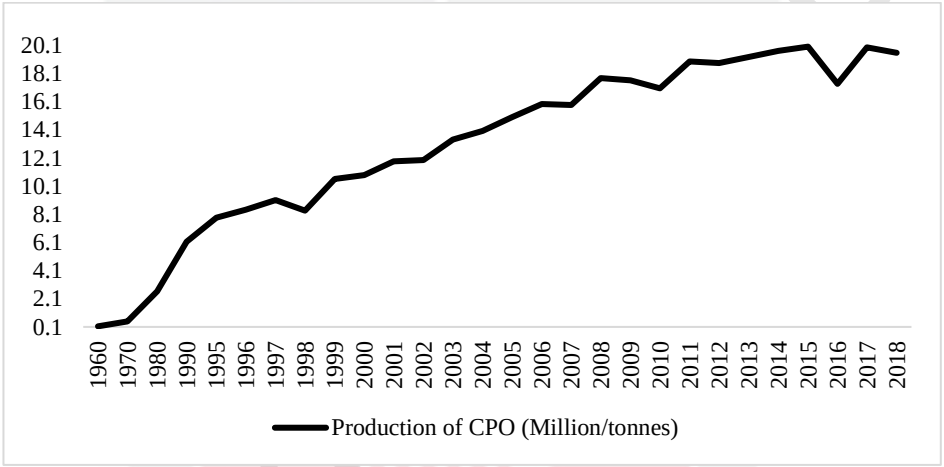

Figure 1.1: Palm Oil Production in Malaysia
(Source: Malaysian Oil Palm Statistics 2016 and Malaysian Palm Oil Board)

Currently, the palm oil industry is not only contributing to trade surpluses but also accounts for two-thirds of the total agriculture export value. In 2018, the palm oil industry export value was equal to RM 44.92 billion (4.5 percent) which made it the fourth largest industry contributing to Malaysia's total exports as shown in Figure 1.2. From the figure, Electrical & Electronic was the largest contributed of export earnings (RM 380.31 billion or 38.1 percent) followed by Petroleum products (RM 76.5billion or 7.7 percent), and Chemical & chemical products (RM57.7 billion or 5.8 percent).

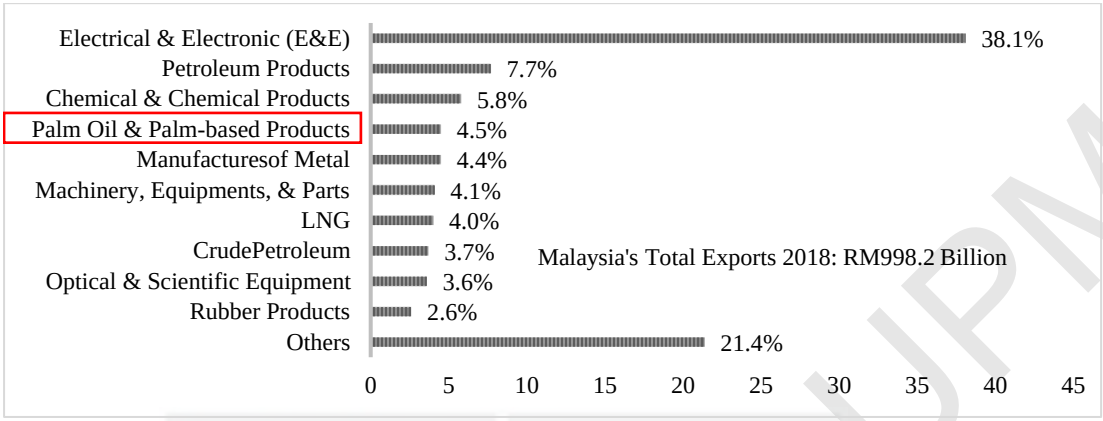

Figure 1.2: Malaysia's Export Contribution by Industry in 2018
(Source: Ministry of International Trade and Industry (MITI), 2019)

According to Rasiah and Shahrin (2006), as a result of the expansion of the palm oil sector, the agricultural exports of the 1980s have been replaced by more diverse downstream products with higher value-added. As shows in Table 1.4, it can be seen that palm oil is a significant export of Malaysia whose contribution to Malaysian GDP increased from 16.90 percent, which is equals to RM26.08 billion to 45.14 percent (RM 85.64 billion) in 2018.

Table 1.4: Palm Oil Contribution in the Overall Commodities Export Value

Year	Palm oil export value (RM Billion)	Export value of all commodities[3] (RM Billion)	Palm contribution in the overall commodities export value (%)
1990	4.41	26.08	16.90
1995	10.39	27.78	37.41
2008	45.75	103.72	44.11
2009	35.79	70.58	50.71
2010	43.84	90.22	48.60
2011	59.07	112.26	52.62
2012	53.17	98.36	53.02
2013	42.63	87.57	48.68
2014	42.81	87.35	49.01
2015	40.12	77.76	51.59
2016	41.44	74.33	55.76
2017	46.09	86.59	53.22
2018	38.66	85.64	45.14

(Source: Various Monthly Statistical Bulletins from Bank Negara Malaysia)
*Note: Commodities included natural rubber; saw logs; sawn timber; palm oil; tin; crude oil

[3] Commodities included natural rubber, saw logs, sawn timber, palm oil, tin, and crude oil.

Figure 1.3 shows that the total export revenues from palm oil exports fluctuated even though total export volume increased continuously over the year, from 12.37 million tonnes in 2000 to 24.88 million tonnes in 2018. As compared to 2017, total Malaysian export of palm oil products in 2018 amounted to 24.88 million tonnes, higher by 3.8 percent from 23.97 million tonnes exported in 2017. It is important to note that a high volume of palm oil exports does not always imply a high level of export revenue because market prices fluctuate depending on a variety of factors such as climate change, overall consumption, and the global price of other oil substitutes (MPOB Report, 2018) . In 2018, total export revenue however declined sharply by 13.3 percent to RM 67.49 billion as compared to the RM 77.81 billion in 2017 due to lower process in world trade.

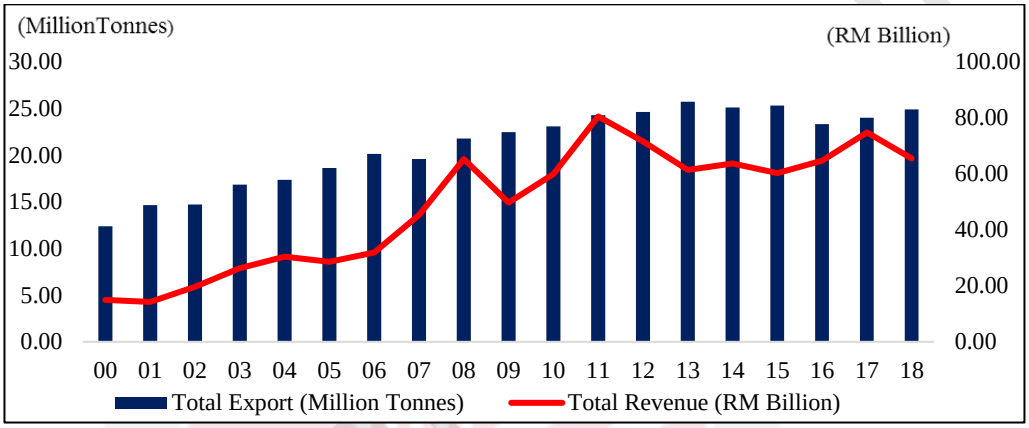

Figure 1.3: Total Palm Oil Export by Volume (Million Tonnes) and Total Revenue (RM Billion)
(Source: Malaysian Oil Palm Statistics, 2019)

1.3 Value Chain Concepts

The concept of the value chain was first used by Michael Porter (1985) in his book "Competitive Advantage: Creating and Sustaining Superior Performance" to describe activities within and around organisations and analyse organisation's competitive strength. Porter (1985) created the value chain framework to divide a firm into strategically relevant activities to understand the behaviour of costs and potential sources of differentiation (see Figure 1.4).

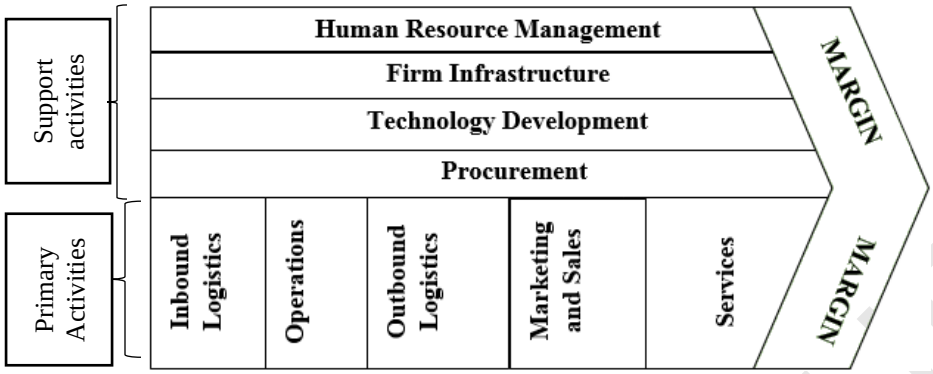

Figure 1.4: Porter's Basic Value Chain
(Sources: Porter, M. E. (1985), Competitive Advantage)

From figure 1.4, Porter discriminates between primary and support activities. Primary activities are causally related and involved with adding value to inputs and transforming the inputs into customers' goods and services. The primary activities comprise inbound logistics, operations, outbound logistics, marketing and sales, and services. Support activities are linked to support primary activities, which help improve effectiveness and efficiency. Hence, both primary and support activities are essential to improve their effectiveness and efficiency and improve margin.

1.3.1 Differences between Value Chain and Supply Chain

The value chain concept evaluates which value each specific activity adds to the product or services organisations. Therefore, the value chain analysis represents the company as a continuous process of value creation activities. Webber and Labaste (2009) described the value chain as a key framework for understanding how inputs are brought together to produce output and distributed to customers. In other words, the value chain explains how the value increases in the process of converting the input to output.

To understand the value chain concept, we first need to know the differences between the value chain and the supply chain. Both the value chain and the supply chain are similar, but the value chain considers more than the supply chain. Nowadays, understanding the value chain concept is particularly important for companies to compete in the global market. There is a desire to use the term "value chain" and "supply chain" interchangeably, but there is a discrepancy between the value chain and supply chain concepts.

Firstly, from the perspective of similarities, Feller et al. (2006) and Palsson (2015) agree that both the supply chain and the value chain are complementary because both chains operate within the same network of companies and are made up of companies interacting to deliver goods and services. However, most researchers agree that both the value chain concepts, and the supply chain are different, where the supply chain is used to account for any activity involving either the production or delivery of final products or services

(from supplier to customer). Apart from that, the supply chain model concentrates on activities that transform raw materials into manufacturing operations. From the perspective of agriculture, it is a chained transfer of a commodity from one stakeholder to another.

On the other hand, there is a distinct focus on the value chain and a more extensive scope involving adding value at various stages. Different stakeholders add value to the product in various stages of the supply chain to increase the value of the final product or, in a simple way, the value chain looks at every phase from raw materials to final-user goods or services right down to disposal of the packaging after use (Reddy, 2013).

Besides, Feller et al. (2006), and Webber and Labaste (2009) stated that a supply chain could be referred to as a mechanism needed to transfer a product or service from the supplier to customers. In contrast, a value chain refers to the instrument and resources that carry the customers' product or services to the supplier. Feller et al. (2006) further stated that the supply chain is an upstream activity that focuses on integrating the supplier and producer process, improving efficiency, and reducing waste. The value chain is focusing on downstream activities that create value in the customer's eyes. Palsson's (2015) supported this argument by claiming that the supply chain focuses only on making a product from the raw material placed into the chain, while the value chain considers the entire chain to provide full value to customers. Table 1.5 summarizes the distinction between the supply chain and value chain.

Table 1.5: Different between Supply Chain and Value Chain

Comparison Basis	SUPPLY CHAIN	VALUE CHAIN
Definition	The process of all parties involved in fulfilling a customer's request	A set of interrelated activities that adds value to the product to create a competitive advantage
Originated From	Operation management	Business management
Concept	conveyance	Value addition
Chronology	Product request – Supply chain - Customers	Based on customer request– value chain - products
Objective	Customer satisfaction	Gaining competitive advantage

(Source: Feller, Shunk, and Callarman (2006).

1.3.2 Agricultural Value Chain Development

Nowadays, in a world of increasingly demanding and competitive global markets, the value chain has become an increasingly important factor in facilitating agricultural transformation. The role of the value chain has grown due to the increasing global production of agriculture. For decades, the development of value chains has attracted both the public and private sectors. Since the Malaysian markets remained

underdeveloped at independence, much effort has been devoted to nurturing value-adding activities. Agriculture value chain analysis is considered as an analytical tool that maps the chain actors and their roles in production, processing, transporting and distribution, and sales of products to understand the relationships and coordination mechanisms, powers, and governance among the chain actors and identify constraints along the chain (Kaplinisky and Morris, 2001). Getachew (2012) viewed the agriculture value chain as an economic unit of commodity analysis that involves a meaningful grouping of economic activities linked vertically by market relationships.

A simple agriculture value chain usually exists in the food sector, invariably found for paddy and rice, fruit and vegetables, dairy, meat, and fisheries. This sub-sector is dominated by enterprises such as Nestle (Malaysia) Berhad, Ayamas Food Corporation Sdn. Bhd., Ramly Food Processing Sdn. Bhd., Kellogg Asia Products Sdn. Bhd., Hershey Malaysia Sdn. Bhd., and Kawan Food Berhad. Their value chains can be generalised and broken into four main stages, namely, (i) agricultural inputs, (ii) primary agricultural production, (iii) primary processing and packaging (iv) distribution and marketing/trade (refer to Figure 1.5).

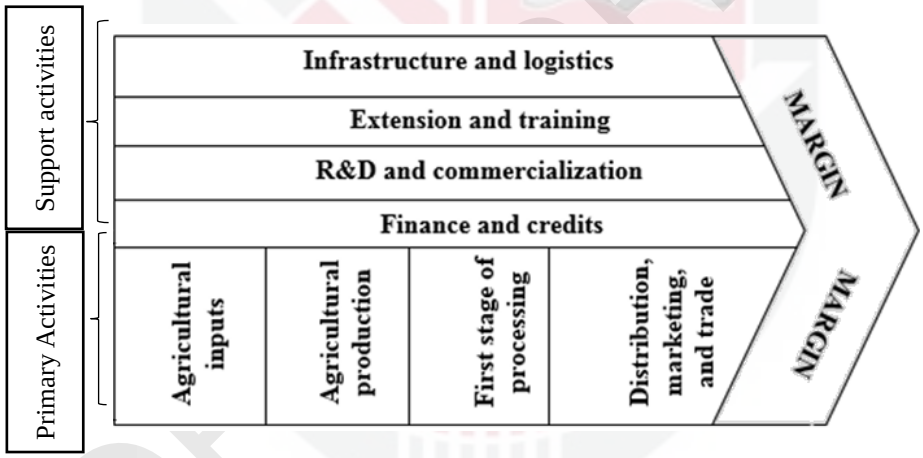

Figure 1.5: Food Value Chains in Malaysia
(Source: Tey and Brindal, 2018)

The agriculture sector in Malaysia has undergone a substantial transformation. The development in value chains has become increasingly clear over time due to globalisation and high demand for value-added products. This circumstance has forced the agriculture sector to produce more value-added products. In the 1970's to 1980s, the focus on primary processing was intensified. The government expanded the processing and marketing of commodities to intensify inter-sectoral integration. Thus, the commodities' value chain has developed beyond primary processing, such as the transformation of palm oil, rubber, and cocoa (refer to Figure 1.6).

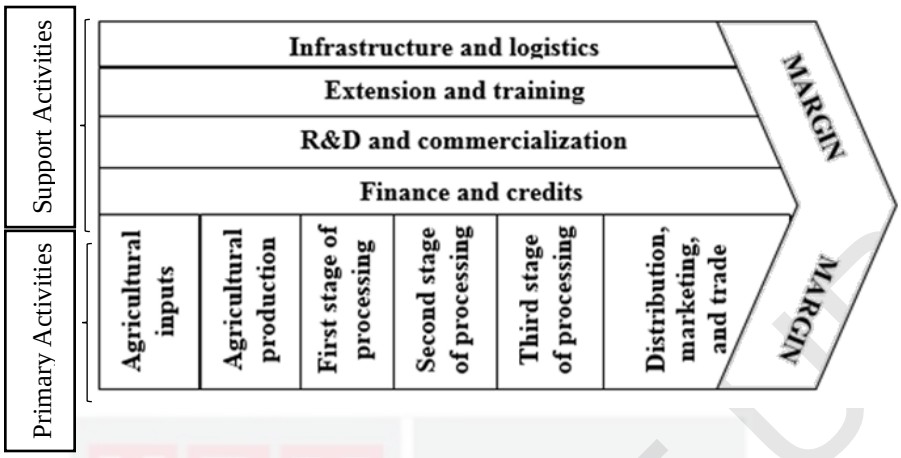

Figure 1.6: Commodity Value Chains in Malaysia
(Source: Tey and Brindal, 2018)

In Figure 1.6, the commodities' value chain has developed beyond primary processing (food sector value chain). Despite the varied pace and length in each particular value chain development, such transformation is evident for palm oil, rubber, and cocoa. For example, the rubber industry has expanded from primary processing to manufacturing various end products (including gloves, tires, and automobile parts). The cocoa industry has experienced a similar development, although primary processing outputs (cocoa paste, cocoa butter, and cocoa powder) remain the main exports.

Palm oil value chains have encompassed milling, refining, oleochemicals, and biodiesel. Hence, the primary, secondary, and tertiary processing stages are captured, producing feedstock for commercial applications in the fourth stage of processing. These commodity sectors have taken an enhanced value path. Hence, both the food and commodity sectors' value chain show the products flow through several stages to achieve the margins. Therefore, the margin can only succeed if the companies can integrate all value chain activities to produce the goods or services to the customers at the price level that the customers are willing to pay[4].

1.3.3 Palm Oil Value Chain

In this study, the value chain in palm oil can be interpreted as the interlinked activities of production, marketing, transformations, and distribution that starts with primary production upstream the value chain and leads to products and services that end-users consume, generally associated with an increase of market value per unit constituent along the palm oil supply chain. Nowadays, palm oil has become a global commodity, with a growing demand not only in developed economies, but also in emerging economies such as China and India, and increasingly in developing countries that depend more on imported vegetable oils. Palm oil in Malaysia was developed with a strong vertical

[4] the price that customers are willing to pay is more than the sum cost of all activities in the value chain

integration between plantations, mills, refineries, oleochemicals/biofuels. The Malaysian palm oil industry consists of interrelated sectors that produce various palm products for their end-users.

All sectors need to operate efficiently to ensure the efficiency of this industry. Formerly, the palm oil industry was mainly concentrated on upstream activities such as cultivating palms for the production of fruit bunches in plantations, processing fresh fruit bunches (FFB) in mills for crude palm oil (CPO) and palm kernel oil (PKO), producing refined palm oil (RPO) from CPO, and fractionating palm oil (for both crude and refined palm oil) to obtain the liquid olein and solid stearin fraction as well as oleochemical products. However, this traditional approach was changed when the Malaysian government introduced the Economic Transformation Program (ETP) in September 2010. The implementation of ETP gave the palm oil industry a new focus after it was identified as one of the 12 National Key Economic Areas (NKEA) to drive the nation's economy (refer to Table 1.6). The palm oil industry aimed to improve upstream productivity and increase downstream expansion and its sustainable development.

The value chain for palm oil consists of all supply chain members that create value and deliver products to the end customers. It is a sequential set of activities carried out on a raw material resulting in it gaining value in each consecutive activity and eventually becoming a consumable product for end-users. It needs to have a good relationship within the supply channel to deliver a quality product that adds value to the customers (Plazibat et al., 2016). The value chain for palm oil is quite complex and is regarded as a highly organised agricultural system compared to other crops (Mahat, 2012). Since the Malaysian palm oil value chain is complex, this industry comprises of four public policy segments which are upstream, midstream, downstream, and consumer products as shown in Figure 1.7 (Prime Minister's Department Malaysia, 2010).

In order to understand how to capitalise on the opportunities to derive more added value from palm oil, it is crucial to understand that Malaysia's palm oil sector is not a homogenous industry. This industry involves different types of players and the players in this industry can be a pure planter (only owning plantations), planters who own mills (millers), planters who own mills and refineries, and planters engaged in entire value chain activities from upstream to downstream activities such as processors, manufacturers, and retailers (Mahat, 2012).

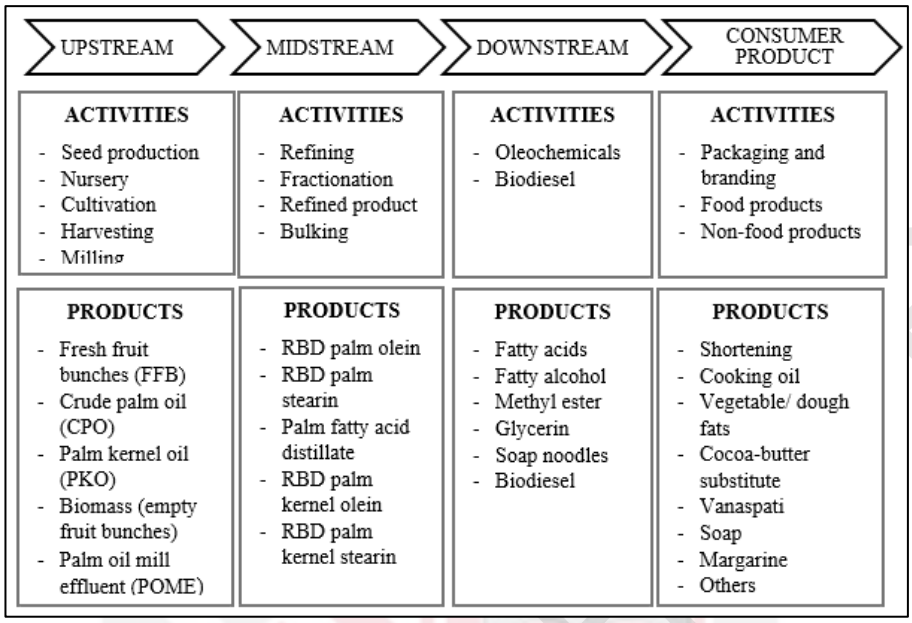

Figure 1.7: Malaysian Palm Oil Industry Supply Chain Process
(Source: Malaysian Palm Oil Board (MPOB) Various Report)

1.3.3.1 Upstream Activities

This segment encompasses nursery, planting, harvesting, collecting, and milling. The cultivation process of palm oil begins with the establishment of a nursery (where seeds are planted in polybags for one year), followed by site preparation (land clearing for planting) and field maintenance (planting of oil palm seedlings at the plantation site). Fresh fruit bunches (FFB) processing includes harvesting, storing, and preparing the FFB for the primary market. FFB harvesting cycle starts when they are ripe, and this cycle needs to be completed when the fruits are mature to optimise quality and quantity productivity (usually 30 months). The typical commercial life of the oil palm tree is approximately 25 years old. The FFB is then transported to the mill for the following process[5].

The first stage of processing occurs at the mill, where a grading process takes place to identify good quality FFBs and separate them from unripe, rotten, or overripe bunches. The selected FFBs then go through sterilisation using saturated steam in large, pressured vessels or cages. During this process, almost all of the fruits are softened and detached from the bunch. They are then placed in a rotating drum that uses centrifugal force to dislodge the sterilised fruit through gaps between bars. The stalks are discharged from the other end. These soft fruits are turned into a homogenous mash in a digester. They then pass through a screw press from which crude palm oil (CPO) and palm kernel oil

[5] It is important to ensure that FFBs are processed within 24 hours of harvesting to prevent a rapid rise of free fatty acids (FFA) in order to maintain the quality of the extracted palm oil.

(PKO) are extracted. The CPO and PKO are related but totally different products. The crude palm oil can either be used directly or further refined (Figure 1.9). It is then purified as it passes continuously through a vibrating screen clarifier and purifier. However, in this state, the CPO is neither in an edible form nor suitable even for non-food products. It needs to undergo further refining before use.

1.3.3.2 Refineries Activities

The refineries segment includes refining, bulking, and trading activities. During this processing, CPO and PKO were processed into refined oil[6]. In the case of the CPO, the waste and water are cleared and separated from the CPO, and then this cleaned CPO is sent for refining. In contrast, the palm kernel nut is sent for crushing to obtain crude palm kernel oil (CPKO) and a by-product, the palm kernel cake (used as animal feed). Meanwhile, the empty fruit bunches, the liquid waste, and the remaining sludge or Palm Oil Mill Effluent (POME) are used as fertilisers in the plantations. In the second stage of the refining process, CPO and CPKO will undergo an impurities removal process to remove the colours (by bleaching) and odours (by deodorising). The oil will be processed into different grades by fractionation to produce either refined, bleached, and deodorised palm oil (RBD) or neutralised, bleached, and deodorised palm oil (NBD). RBD palm oil, RBD palm olein, RBD palm stearin, and RBD PKO are the products of the refining process. RBD palm oil is processed into RBD palm olein and RBD stearin. With a lower proportion of saturated oil than RBD palm stearin, RBD palm olein is mainly used as cooking oil and in processed foods' industrial frying. It also blends well with other vegetable oils. RBD palm stearin (for its high proportion of saturated oil) and RBD PKO (for its high proportion of lauric acid) are primarily used to manufacture specialty fats and oleochemicals. Thus, palm oil extracted from the pulp of oil palm fruits is used in food production, while PKO extracted from the kernel is usually used in cosmetics products. Moreover, Basiron and Weng (2004) stated that palm oil produced 80 percent of edible products and the remaining 20 percent of non-edible products[7].

1.3.3.3 Downstream Activities

The downstream activity includes all activities for processing oil palm into semi-finished materials or finished product for local and global consumers including the palm oil refining, palm kernel crushing, palm oil based edible and non-edible products, specialty fats and oleochemicals products (Mahat, 2012). CPO olein and CPO stearin are among the leading segments of palm oil derivatives among these diverse derivatives. Olein is used as raw material for cooking oil, and stearin is used for margarine shortening and specialty fats. Refinery by-product, i.e., the oleochemical industry, will process the Palm Fatty Acid Distillate (PFAD). The palm oil derivative products have the configuration of difference which causes the difference in value-added products. The downstream segment consists of non-food downstream and food and health-based downstream. The

[6] One tonne of PKO is produced for each ton of CPO derived

[7] An edible product is extracted from the pulp of palm fruits while non-edible products (usually used in cosmetics products) are from the kernel

downstream segment for palm oil products can be divided into (i) oleochemicals; (ii) biodiesel; and (iii) palm based finished products or consumer products.

Oleochemicals are the chemicals which are mainly derived from oils and fats. The oleochemicals industry in Malaysia started in the early 1980's and today the Malaysian oleochemicals industry is one of the largest oleochemicals industry, accounting for 20 percent of the global capacity (ASEAN Oleochemical Manufactures Group, AOMG). Major feedstock for those oleochemicals was processed palm oil, palm stearin and palm kernel oil. A consistent supply of PO and PKO has led to the development of the oleochemicals industry in the country. Oleochemicals which derived from PO and PKO can be widely uses to produce a variety of consumer products through processing such as emulsifiers and vitamin E. Palm oil can be converted into palm biodiesel through transesterification. Nonetheless, the biodiesel industry is currently at a standstill mainly due to excess capacity and the high cost of feedstock. Moreover, palm oil can also be directly used to produce biofuel. Palm based products or consumer products can be in edible or non-edible products, from foods to soaps, personal care, cosmetics, and feedstock for biodiesel (refer Figure 1.8). Due to the diversity of palm oil used (produce edible or non-edible palm oil products), it has gained the highest demand on the international market and has become the fastest-growing large-scale agricultural product globally.

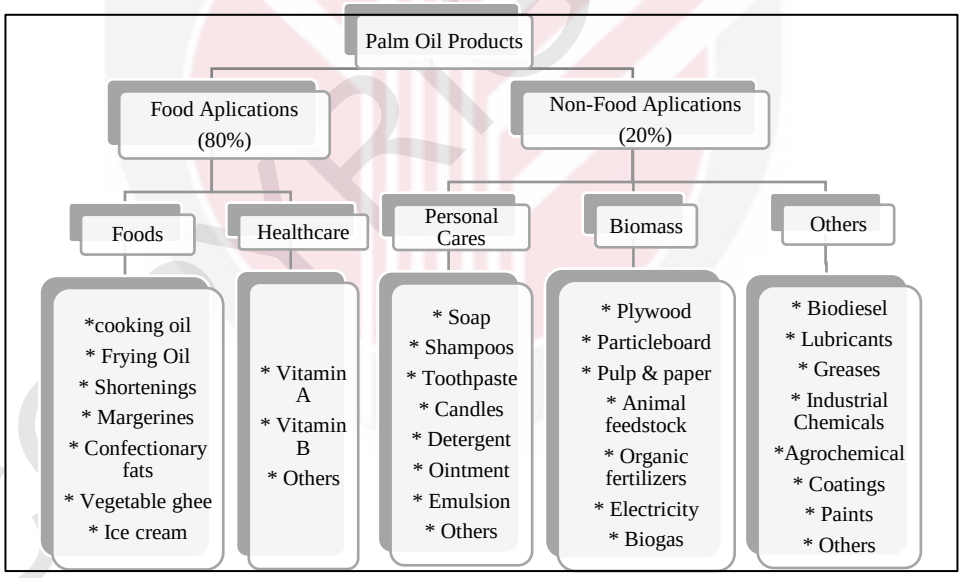

Figure 1.8: Edible and Non-Edible Products of Palm Oil Value Chain
(Source: MPOB)

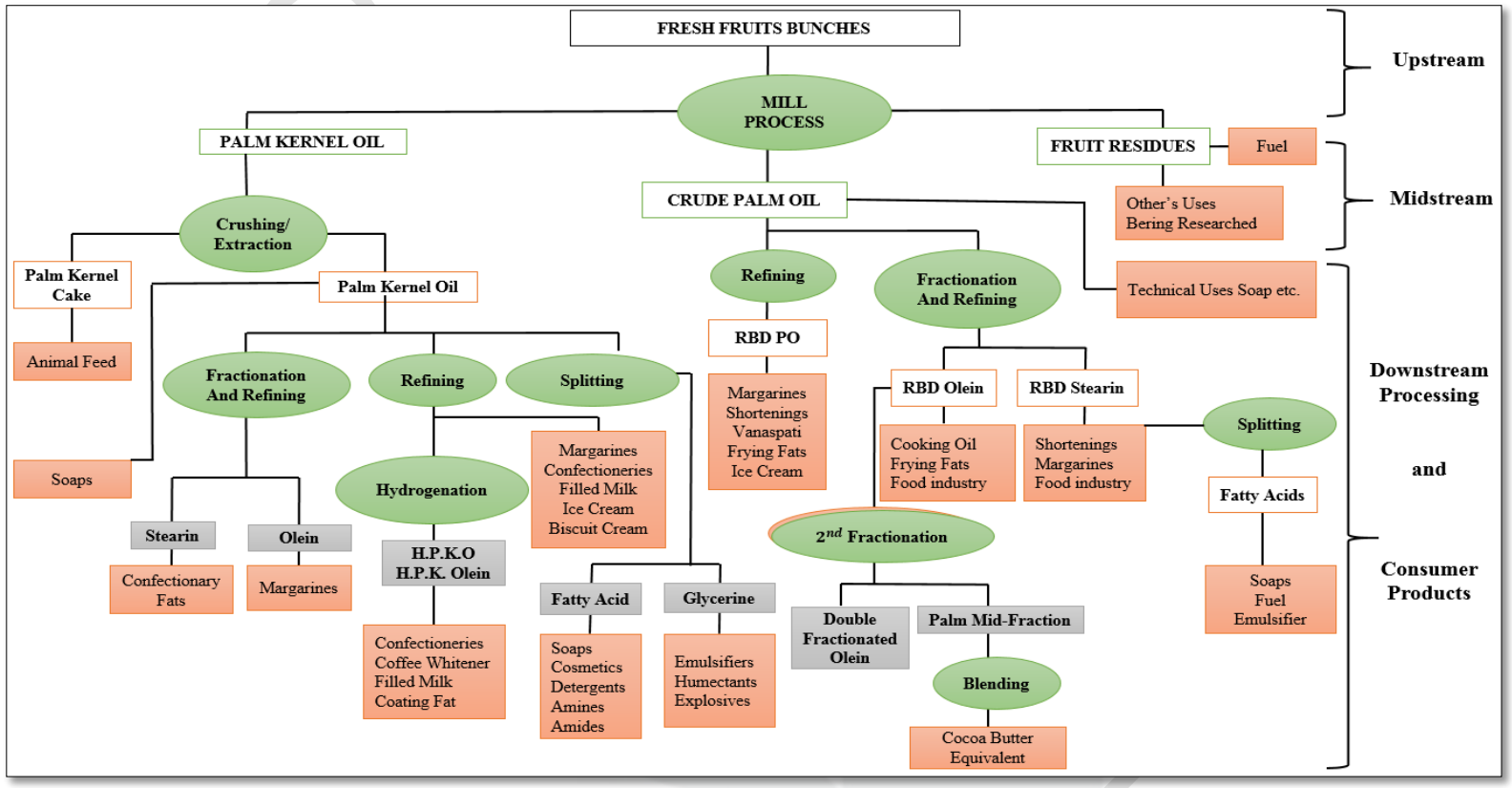

Figure 1.9: The Process of Palm Oil Value Chain and Application
(Source: Seng, 2014)

1.4 Issues in Palm Oil Industry Malaysia Related to Efficiency and Economic Value Added

The palm oil industry has been the backbone of Malaysia's agricultural economic sector since the 1960s (Basiron, 2007). Palm oil's contribution to the Malaysian economic is well recognized and the country has a competitive advantage since it has 100 years of experience in this industry. In 2018, as reported by the Malaysian Palm Oil Board (MPOB), Malaysia has accounted for 39 percent of the world's palm oil production and 44 percent of the world's export, making Malaysia the second-largest producer exporter of palm oil in the world after Indonesia. However, Malaysia was the largest palm oil producer and exporter in the world in 1960s until 2005, before being surpassed by Indonesia in 2006.

Formerly, the industry was mainly concentrated on upstream activities such as cultivating palms for production of fruit bunches in plantations and processing fresh fruit bunches (FFB) in mills for CPO and PKO. However, this traditional approach was changed when the Malaysian government introduced the Economic Transformation Program (ETP) in September 2010. The ETP is a comprehensive effort that outlines a 10-year economic roadmap to energize Malaysia toward becoming a high-income nation by 2020. The implementation of the ETP gave the oil palm industry a new focus after it was identified as one of the 12 National Key Economic Areas (NKEA) to drive the nation's economy as shown in Table 1.5. The palm oil sector NKEA is aimed at improving upstream productivity and increasing downstream expansion, while focusing on the sustainable development of the palm oil industry. By year 2020, this industry alone is projected to hit RM 178 billion Malaysian gross national income (GNI).

Table 1.6: Twelve Core National Key Economic Area (NKEA) under the Economic Transformation Program (ETP)

NKEA	SECTOR
NKEA 1	Oil, Gas, and Energy
NKEA 2	**PALM OIL**
NKEA 3	Financial Services
NKEA 4	Tourism
NKEA 5	Business Services
NKEA 6	Electronics and Electrical
NKEA 7	Wholesale and Retail
NKEA 8	Education
NKEA 9	Healthcare
NKEA 10	Communications Content and Infrastructure
NKEA 11	Agriculture
NKEA 12	Greater Kuala Lumpur/ Klang Valley

(Source: Economic Transformation Program (ETP): A Roadmap for Malaysia)

As previously mentioned, the Malaysian government launched the ETP in 2010, which identified the palm oil industry as one of the 12 NKEAs. By the year 2020, this industry

alone is projected to hit RM 178 billion Malaysian gross national income (GNI). In order to achieve this GNI target, eight entry point project (EPP) were identified as illustrated in Figure 1.10, spanning across the palm oil value chain. From this policy reform, it is obvious that some of the projects in the palm oil sector will be government-led and funded although it has also elevated the level of private sector involvement.

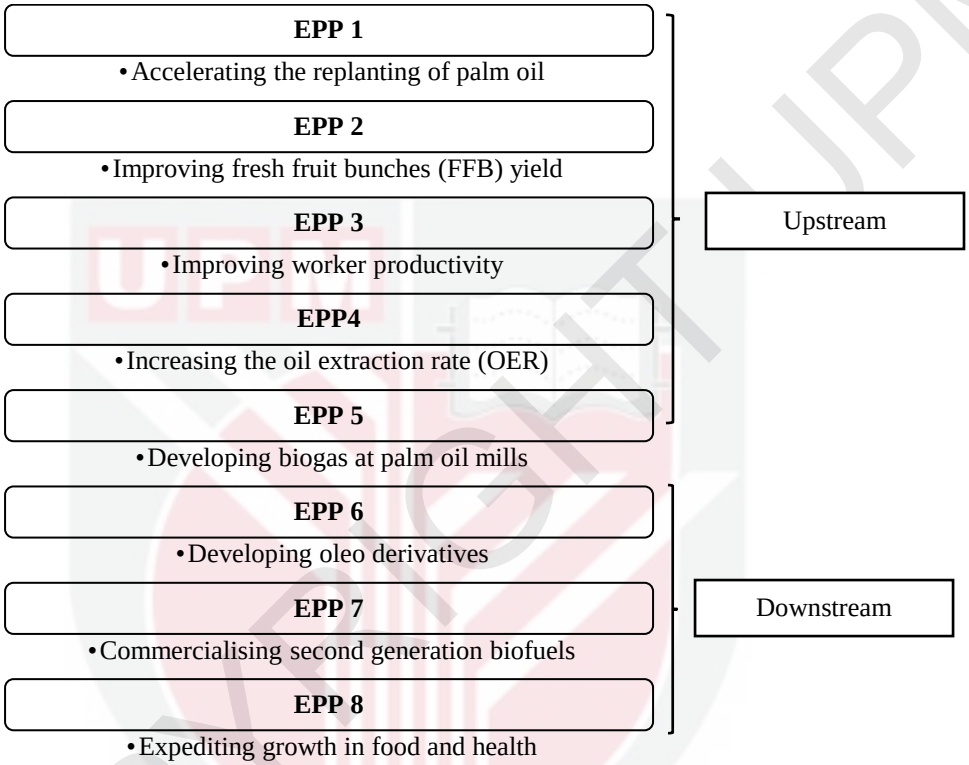

Figure 1.10: Eight Entry Point Project (EPP)
(Source: Economic Transformation Programme (ETP): A Roadmap for Malaysia)

Based on the Figure 1.10, palm oil EPP 1 to EPP 5 are focusing on upstream level where these EPPs aims to improve the upstream productivity of palm oil by improving the productivity in this industry which is from 21 to 26.2 tonnes per hectare per year. Meanwhile, palm oil EPP 6 to EPP 8 are focusing on downstream expansion where these downstream's EPP activities are expected to generate GNI of RM 14.0 billion and this will constitute at least 25 percent of total palm oil income.

Thus, to achieve this mission, the Malaysian government has mobilized the plantation companies to implement this mission since they play an important role to reinforce the core focus of the palm oil NKEA. This is in line with a study by Ramasamy et al. (2005) which stated that the private sector is the main driver for the palm oil growth in Malaysia. In addition to this, Kamalrudin and Abdullah (2014) insisted that the in the palm oil

industry, plantation companies are generally owned by private entities and government linked companies. This shows the importance of plantation companies to drive growth in this industry as well as to contribute to the Malaysian economy. The expansion of oil palm plantation area was inevitable due to the existence of many companies in this industry, which has increased from 0.64 million hectares in 1975 to 5.9 million hectares in 2019. Out of this number, 71.7 percent of the total plantation area in 2019 belongs to plantation companies as shows in Figure 1.13 (MPOB, 2019).

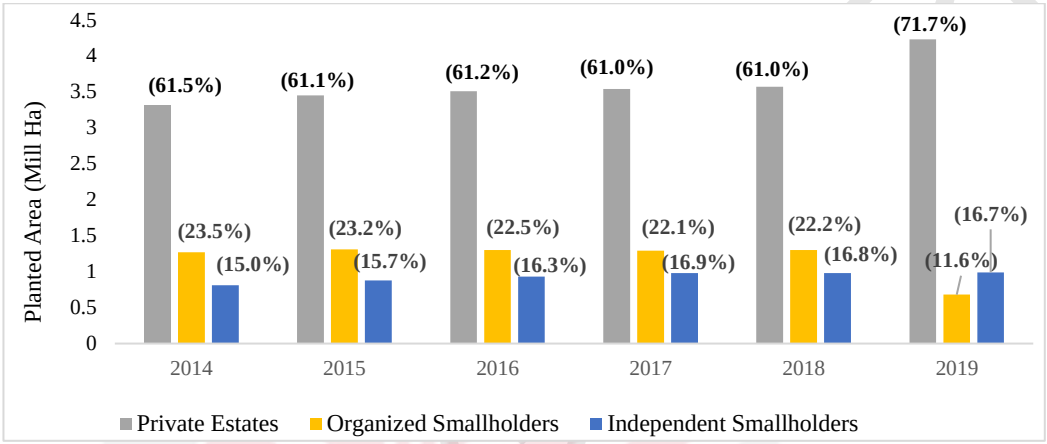

Figure 1.11: Distribution of Oil Palm Planted Area in Malaysia by Category and Share (%) from 2014 to 2019
(Source: Malaysian Oil Palm Statistics, 2020)

Plantation companies in Malaysia are companies that are engaged in the cultivation, planting, and replanting of crops. Processing of agricultural products in factories on farms and plantations is also included when it is not feasible to record this operation separately from crop production (Bursa Malaysia, 2018). In Malaysia, palm oil plantations vary considerably in size from a few hundred hectares to more than 100,000 hectares. As of 2018, the largest plantation companies in Malaysia based on planting area are Felda Global Ventures Holdings Berhad (339,385 hectares), Sime Darby Plantation Berhad (312,578 hectares), Genting Plantations Berhad (247,000 hectares), Batu Kawan Berhad (219,000 hectares), Kuala Lumpur Kepong Berhad (210,000 hectares), IOI Corporation Berhad (175,117 hectares), Sarawak Oil Palms Berhad (119,000 hectares), and TH Plantations Berhad (101,000 hectares. All of these companies are listed in the Bursa Malaysia as well as on foreign stock exchanges.

In 2018, there were about 44 plantation Bursa-listed companies in Malaysia that are involved with the palm oil activities along the supply chain process, from planting, mills, refining, oleochemicals or biofuel activities, and producing consumer products as shown in Table 1.7[8].

[8] This is the number of plantation companies that were listed in Bursa Malaysia as of December 2018. However, the number of plantation companies that were used in the study is 40 plantation companies due to the limitations that will be further explained in Chapter 3 in Section 3.2 (Data Sources).

Table 1.7: Listed Plantation Companies in Bursa Malaysia as of 2018 based on Value Chain Activities

Plantation Activity	
1. Astral Asia Berhad	7. Kluang Rubber Company (Malaya) Berhad
2. Dutaland Berhad	8. Matang Berhad
3. Gopeng Berhad	9. PLS Plantations Berhad
4. Hap Seng Plantations Holdings Berhad	10. Riverview Rubber Estates Berhad
5. Inch Kenneth Kajang Rubber Public Ltd Co	11. Sin Heng Chan (Malaya) Berhad
6. Innoprise Plantations Berhad	12. Sungei Bagan Rubber Company (Malaya) Berhad
Plantation and Mills Activity	
1. Boustead Plantations Berhad	11. MHC Plantations Bhd
2. Cepatwawasan Group Berhad	12. Negri Sembilan Oil Palms Berhad
3. Chin Teck Plantations Berhad	13. NPC Resources Berhad
4. Far East Holdings Berhad	14. Pinehilll Pacific Berhad
5. Golden Land Berhad	15. Rimbunan Sawit Berhad
6. Harn Len Corporation Bhd	16. Sarawak Plantation Berhad
7. IJM Plantations Berhad	17. Ta Ann Holdings Berhad
8. Jaya Tiasa Holdings Bhd	18. TDM Berhad
9. Kim Loong Resources Berhad	19. TH Plantations Berhad
10. Malpac Holdings Berhad	20. United Malacca Berhad
Plantation, Mills, and Refineries Activity	
1. BLD Plantation Bhd.	4. TSH Resources Berhad
2. Kretam Holdings Berhad	5. United Plantations Berhad
3. Kwantas Corporation Berhad	
Plantation, Mills, Refineries, and Oleochemicals/ Biodiesel Activity	
1. Batu Kawan Berhad	5. Kuala Lumpur Kepong Berhad
2. FGV Holdings Berhad	6. Sarawak Oil Palms Berhad
3. Genting Plantations Berhad	7. Sime Darby Plantation Berhad
4. IOI Corporation Berhad	

(Source: Bursa Malaysia and Companies Annual Report)

However, as can be seen in Figure 1.12, the Malaysian palm oil industry has yet to capture the full potential of existing downstream opportunities, which in 2018, only 20.8 percent of Malaysia's palm oil output was exported as downstream products (consisting of oleochemicals, biodiesel, finished products, and other oil palm products) as opposed to 79.2 percent exported as upstream products in crude form (crude palm oil, palm kernel oil, and palm kernel cake).

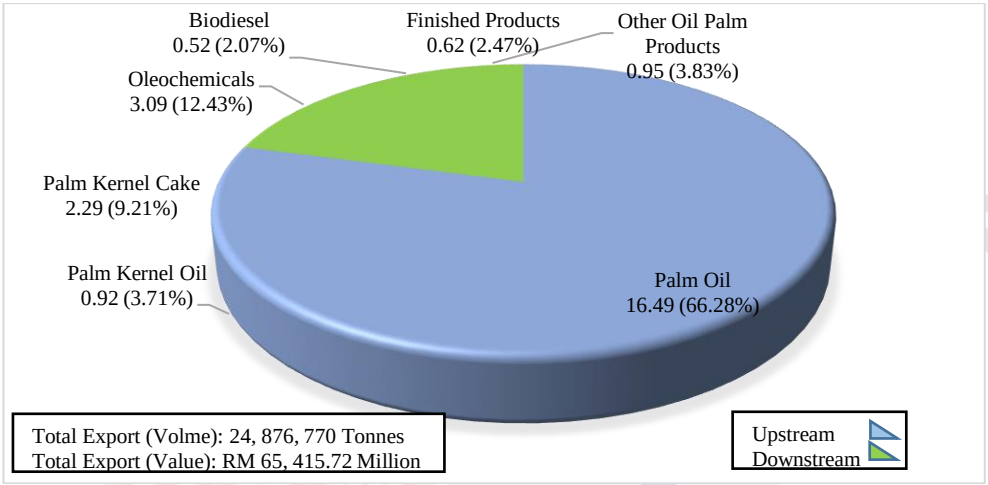

Figure 1.12: Malaysia's Annual Palm Oil Export Volume by Products in 2018
(Source: Malaysian Oil Palm Statistics, 2019)

Historically, the decline in palm oil export revenue has contributed to the industry's declining GDP contribution (MPOB, 2018). As shown in Table 1.8, the contribution of palm oil sharply declined from 4.15 percent in 2015 to 2.77 percent in 2018, which recorded the lowest percentage GDP obtained by the palm oil industry. Lower CPO price fluctuations coupled with lower FFBs production have been recognized as the major obstacles contributing to the problem of the declining palm oil GDP contribution (MPOB, 2018).

Table 1.8: Gross Domestic Product (GDP) and Value of Palm Oil from 2015 to 2018

Palm oil performance	2015	2016	2017	2018
Palm oil GDP (%)	4.15	3.79	3.82	2.77
Palm oil Value (RM billion)	44.13	42.03	44.87	37.67

(Source: Selected Agricultural Indicators, Malaysia, 2016-2019, Department of Statistics Malaysia)

As can see in Figure 1.13, the prices of oil palm products were traded lower as shown in 2018, which is by 19.8 percent, averaging RM 550.50 per tonne to RM 2232.50 per tonne compared to RM 2783.00 per tonne in 2017. The lower CPO price was mainly due to the higher palm oil stocks arising from lower palm oil export demand coupled with weaker prices of other vegetable oil in the world market (MPOB, 2019).

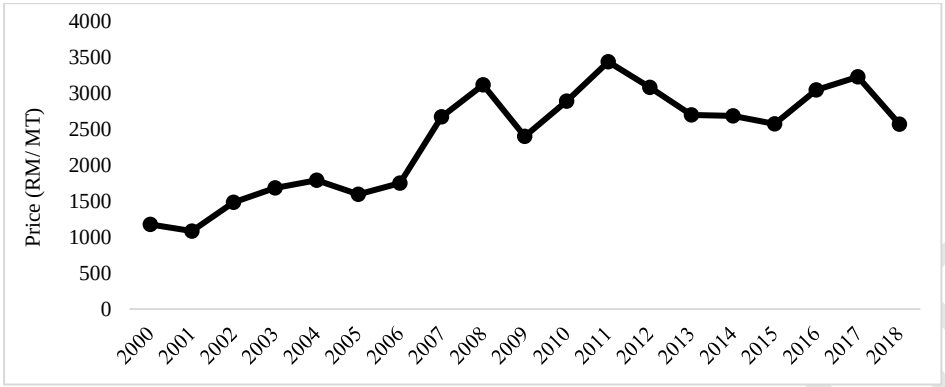

Figure 1.13: Crude Palm Oil Price, 2000 to 2018 (RM/ Million tonnes)
(Source: MPOB)

Other than palm oil price fluctuations, this industry faces another major issue regarding the limited availability of cultivable lands. Mahat (2012) stated that plantation companies have traditionally viewed upstream activities as their core business since they have aggressively increased their planting activities by opening more cropping areas to increase production. (2010) reported that Malaysia's maximum planted area is capped at 6 million hectares However, the shortage of land has created the need to venture into the downstream segment since the plantation companies can no longer rely on upstream production for expansion The ETP with the maximum limit almost reached in 2019 at 5.9 million hectares.

These obstacles faced by the palm oil industry have affected the plantation companies' profits, which is a cause for concern since the plantation companies plays a major role in accelerating the economic growth in Malaysia. Wee and Talib (2009) stated that the profits earned by the plantation companies are based on the total export of palm oil, since the main activity of plantation companies is exports. As shows in Figure 1.13, the overall profits generated by the plantation companies showed a sharp decline to 3.4 percent in 2018, as compared to 7.0 percent in 2017.

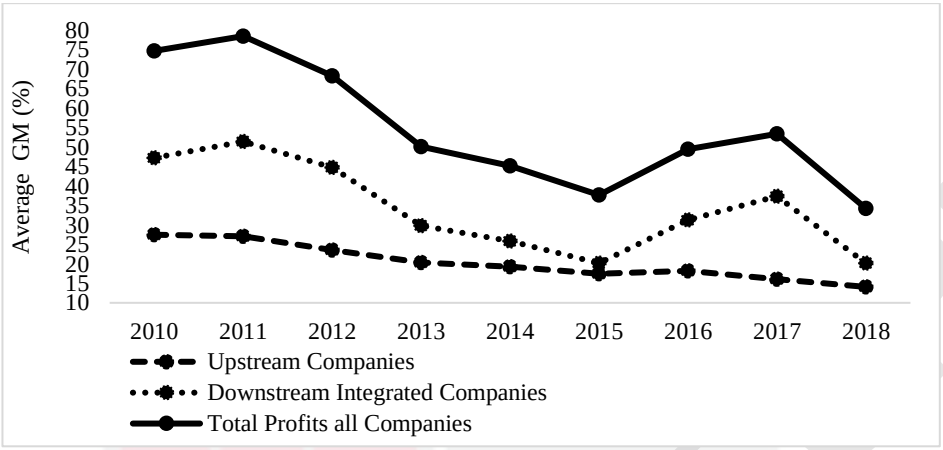

Figure 1.14: Average Profit of Plantation Companies based on Categories (Pure Upstream and Downstream Integrated Plantation Companies), 2010-2018
(Source: Financial Statement Companies Annual Report)

With this situation, the question here is how the efficiency of plantation companies affects the palm oil industry because the efficiency will reflect the industry's performance. Hence, it is important to measure how effectively plantation companies can earn higher profits. Besides, other than to maximize the profits, creating wealth for their shareholders is the goal of most companies. However, profits alone are not enough to determine the exact wealth of the shareholders. According to (Wainaina, 2001), investors and corporate managers have been seeking a reliable measurement of shareholders' wealth. Due to this, the economic value added (EVA) model is the most reliable and accurate model to explain the shareholders' wealth. It is important to measure the wealth of shareholders in the companies since they have a fundamental role in the companies. Every firm has an implicit required rate of return to its shareholders and debt holders. This required rate of return represents the opportunity cost which is adjusted for risk that investors bear when they invest in a particular company. By knowing the return that is earn by the shareholders, it will assist them to make a decision as to remain in or disinvest from a company. It can also guide a new investor to decide which plantation companies to invest.

Therefore, the plantation companies need to focus on internal efficiencies by engaging with all value chain activities, from the upstream to downstream activities, since they have no power in determining the commodity price. The value chain is vital to improving the margins, where it can increase plantation companies' efficiency and increase the economic value added. According to Mahat (2012), the plantation sectors can generate more profit, expand their margin, increase profitability, and earn the excess return if they get into the value added parts of the value chain activities such as processed food production, health foods, oleochemicals, and biodiesel.

In Malaysia, the palm oil industry is considered to have a highly vertical integration of upstream and downstream value chain activities and also as the most highly organized sector in the agriculture system. However, Malaysian palm oil companies have yet to

capture the full potential of existing downstream opportunities as the development of this industry is still heavily skewed towards upstream activities that are focused on the production of FFBs in plantations, processing of FFBs in mills and palm kernel crushing activities (Economic Transformation Program, 2010). The involvement in downstream activities is much needed due to the limitation of land area.

As can be seen in Table 1.7, in 2018, from the total of 44 plantation companies, 32 plantation companies were mainly concentrated on upstream activities (plantation and mills activities), five plantation companies on midstream activities (refineries activities), and seven plantation companies were engaging with full value chain activities that involve upstream to downstream activities (from plantation to oleochemicals/ biodiesel activities). Besides, Kumar et al. (2011) stated that the low participation in downstream integrated activities is believed to be due to a lack of interrelated activities by the companies while a successful coordination in the value chain can have a significant impact on cost reduction and giving the positive income towards planters. As stated in Astral Asia Berhad Annual Report (2018), the decrease of their company's profit and revenue was mainly due to the lower contribution from the plantation segment. This suggests that the plantation companies can only become more efficient and economic value added if they are engaged with more downstream integrated activities. Referring to Figure 1.13, it can be seen that the downstream integrated plantation companies (consisting of plantation companies that are engaged with plantation, mills, refineries, and oleochemicals/biodiesel activities) generate higher profits as compared to pure upstream plantation companies (consisting of plantation companies that are engaged with only plantation and mills activities).

1.5 Problem Statement

Palm oil in Malaysia is the main driver of Malaysia's agricultural sector due to the significant contribution of this industry towards the Malaysian economy (MPOB, 2018). High demand and attractive earnings of palm oil have attracted high participation in this industry. However, lower palm oil prices have affected the performance of the industry, where, in 2018, the total export revenue of this industry declined sharply by 13.3 percent to RM67.49 billion as compared to the RM77.81 billion in 2017 due to lower global palm oil prices (refer Figure 1.3). The decline in palm oil export revenue is reflected in decreasing profits of plantation companies since they are mainly export-oriented (Wee and Talib, 2009), with the total profits of 44 plantation companies declining from 53.43 percent in 2017 to 34.25 percent in 2018 (refer Figure 1.13)

According to Azneal Azam, Sime Darby Plantation's Manager for Corporate Affairs, plantation companies' performance generally follows the CPO price trend, thus higher CPO prices have been beneficial for plantation companies to increase profits (The Malaysian reserve, 3 April 2017). However, it is difficult for plantation companies to increase their profits since they have no power to determine the price of CPO. This is a wake-up call to the Malaysian plantation companies to strengthen their competency and competitiveness so that they can survive in the long term. Thus, plantation companies cannot only depend on high CPO prices to increase their profits. Therefore, it is important to determine how the efficiency of plantation companies can affect the oil palm industry.

Besides, it is important to measure how effectively the plantation companies can create value for themselves.

Due to the above arguments, plantation companies need to focus on internal factors that can increase their profits. According to Wahab, Ismail, and Muhayiddin (2019), the success of a company is determined by its internal factors. The efficiency of this industry highly depends on the coordination and performance of all its value chain sectors.

At its early stages, the palm oil industry was mainly concentrated on upstream activities, but the Malaysian government has encouraged the plantation companies to integrate all value chain activities from upstream activities to more downstream activities since the planted area in Malaysia has already reached the limit of available land area (The Star, 2021). Moreover, extending the value chain activity will help the plantation companies to achieve higher margins. This means that plantation companies that are engaged with upstream activities such as plantation and mills activities will obtain less profit than plantation companies that are engaged with downstream integrated value chain activities from plantation to mills, refineries and oleochemicals/biodiesel activities. In 2018, the average gross margin earned by the upstream plantation companies was 14.10 percent less than the average gross margin that was earned by downstream integrated plantation companies, which was 20.15 percent (refer to Figure 1.13).

The value chain approach helps palm oil producers to identify each part of its production process and to make improvements to deliver the most value for the least possible cost. Operating in a highly competitive market, the producers compete to sustain themselves and to ensure a top market position. Also, in such a market, supernormal profits are nearly impossible, and companies have to be content with small margins that are getting thinner. In such a manner, this study aims to address this gap by examining palm oil companies with different value chain activities in order to understand whether extending the value chain from pure upstream to the more downstream integrated activities will increase profitability.

1.6 Research Questions

Based on the research objective of this study, the following research questions are as follow:

i) What is the profit efficiency scores of plantation companies in Malaysia based on their value chain activities?
ii) What are the inefficiency factors that contribute to the profit efficiency of plantation companies'?
iii) What is the plantation companies' economic value added, and which value chain activities contribute to higher economic value added?

1.7 Research Objectives

The study's general objective is to examine the effect of different value chain activities on plantation companies' performance in terms of profit efficiency and economic value added. Three specific objectives have been highlighted to accomplish the main objective as follows:

i) To assess the profit efficiency of plantation companies involved in different value chain activities.
ii) To investigate inefficiency factors that influence the profit efficiency of plantation companies involved in different value chain activities.
iii) To examine the economic value added and the factors that influence the economic value added of plantation companies involved in different value chain activities

1.8 Significance of the Study

The findings of this study will contribute significantly to the current knowledge on the efficiency and economic value added of the plantation companies. Although there have been extensive studies in the literature investigating the efficiency and economic value added on plantation companies in Malaysia, there is no published study that covers both efficiency and economic value added in previous studies.

The Malaysian palm oil industry is a significant contributor to the Malaysian economy. This success has made the Malaysian palm oil industry into one of the key contributors to Malaysia's GDP, foreign exchange earnings, and employment opportunities, and has become an essential product that has changed the agricultural scenario in Malaysia. At this moment, Malaysia has yet to capture the full potential of existing downstream opportunities (ETP, 2010). As Malaysian palm oil producers have no power to determine the palm oil price, the plantation companies need to focus on their internal factors, which are the value chain activities in order to gain more profits, become more efficient and create value to the companies.

This study is beneficial because it seeks to identify which value chain activities that contribute to plantation companies' efficiency and economic value added. By identifying the most profitable activity, plantation companies can focus on that activity in order to become more efficient and achieve economic value added. In addition, this study can also guide new investors in deciding which plantation companies that they will invest in, based on the economic value added gained by the companies.

From the standpoint of an investor, EVA provides a better predictor of a company's market value or, in other words, helps the investor to choose a company based on their performance. From the perspective of managerial significance, the findings will facilitate plantation companies to focus on the greatest opportunities for increasing their profit efficiency to improve their economic value added since the chosen performance

measurement in this study allows the firms to recognise the internal and external factors affect the firm's growth.

Furthermore, the empirical evidence from this study is essential to the Malaysian Palm Oil Board (MPOB) as they can have new information regarding the plantation companies' performance and take appropriate steps in dealing with the problems that occur in this industry. Moreover, from the perspective of the Malaysian government, it can contribute to solving this industry's problems by formulating and implementing appropriate policies.

1.9 Scope of the Study

The scope of the study is to evaluate the profit efficiency of plantation companies involved in different value chain activities, investigate the inefficiency factors that influence the profit efficiency of plantation companies involved in different value chain activities, and to examine the economic value added and factors that affect the economic value added of plantation companies involved in different value chain activities.

For this study, the first and second objective adopted the same method and theory, whereas the third objective had separated the method and theory. For objective one and objective two, the levels of profit efficiency of plantation companies were measured using the stochastic frontier analysis (SFA). Plantation companies' profit (gross margin) was the output. This study uses SFA to describe the other factors that influence the profit efficiency of the company. Once the profit efficiency is identified for each company, the profit efficiency will be regressed in order to get the average profit efficiency. The average profit efficiency then was used as a dependent variable to identify the inefficiency factors affecting plantation companies profit efficiency.

For objective three, in order to evaluate the economic value added (EVA) and factors that determine the EVA of the plantation companies, the EVA of each plantation companies must first be calculated. The value of EVA then will then serve as the dependent variable in order to determine the factors that influence the plantation companies' EVA. It is important to seek the EVA of the companies so that the investors can have an information about the companies' performance and will guide the new and existing investors in deciding whether to invest, stay, or withdraw from those companies.

This study consists of 40 Malaysian plantation companies that are listed in Bursa Malaysia. For the first and second objectives, the time frame is from 2000 to 2018, while the time frame for third objective is from 2010 to 2018. Secondary data of each company was obtained from DataStream subscribed by the UPM library, Company Annual Reports, and the Bursa Malaysia website. Other sources used in this study were the Bank Negara Malaysia Monthly Statistical Bulletin, Malaysian Oil Palm Statistics (book), and the Malaysian Palm Oil Board (MPOB) website. This study applied unbalanced panel data (time series and cross-sectional) since not all companies have a long history due to emergence, transformation, consolidation, and demergers.

1.10 Organisation of the Study

In order to meet the stated objectives, this study is divided into five chapters; chapter one presents the introduction; chapter two provides the literature review of studies related to profit efficiency and economic value added as well elaborates on the methodology applied in related studies to this study; chapter three highlights the conceptual framework and methodology used to achieve the stated objectives; chapter four reveals the research findings and discussion; and finally chapter five presents the conclusion and recommendations.

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