# IMPACT OF THE 1997-1998 ASIAN FINANCIAL CRISIS ON THE INDONESIAN AND MALAYSIAN PALM OIL AND PALM KERNEL OIL INDUSTRIES

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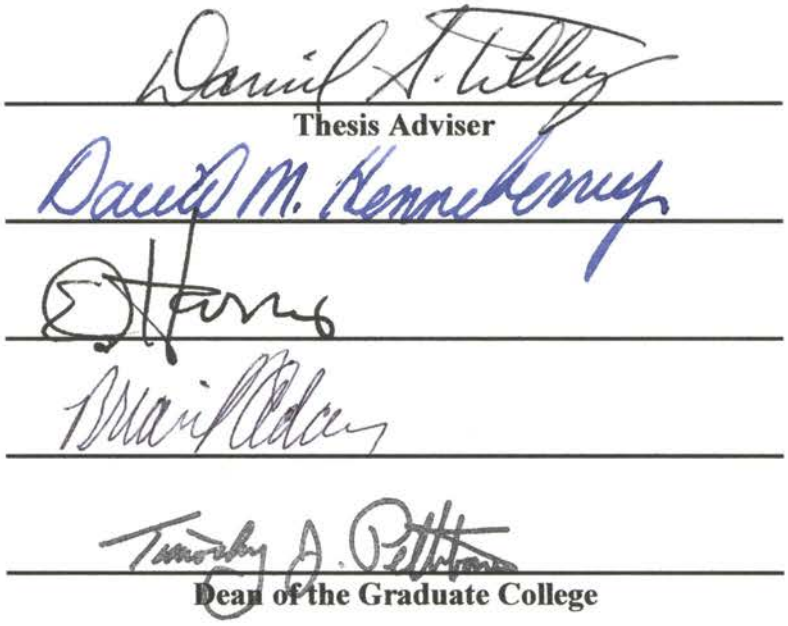

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# NOMENCLATURE

| | |
|---|---|
| ADB | Asian Development Bank |
| BNM | Bank Negara Malaysia |
| BULOG | National Logistic Agency |
| CBS | Currency Board System |
| CPKO | Crude Palm Kernel Oil |
| CPO | Crude Palm Oil |
| FELCRA | Federal Land Consolidation and Rehabilitation Authority |
| FELDA | Federal Land Development Authority |
| FFB | Fresh Fruit Bunches |
| FOB | Freight on Board |
| GDP | Gross Domestic Product |
| GNP | Gross National Product |
| Ha | Hectares |
| IBRA | Indonesian Bank Restructuring Agency |
| IMF | International Monetary Fund |
| INDRA | Indonesian Debt Restructuring Agency |
| JMO | the Joint Marketing Office |
| M$ | Malaysian Ringgit |
| PK | Palm Kernel |

| | |
|---|---|
| PKC | Palm Kernel Cake |
| PFAD | Palm Fatty Acid Distillate |
| PO | Palm Oil |
| PPO | Processed Palm Oil |
| PPKO | Processed Palm Kernel Oil |
| PT | Perusahaan Terbatas |
| PTP | Perseroan Terbatas Perkebunan |
| RBD | Refined Bleached Deodorized |
| RBD Olein | Refined Bleached Deodorized Olein |
| RBD PO | Refined Bleached Deodorized Palm Oil |
| RBD Stearin | Refined Bleached Deodorized Stearin |
| RISDA | Rubber Industry Smallholders Development Authority |
| RM | Malaysian Ringgit |
| Rp | Rupiah |
| US | United States |
| USA | United States of America |

# CHAPTER I

# INTRODUCTION

## 1.1. 1997-1998 Asian Financial Crisis

The Asian financial crisis began on February 5, 1997 in Thailand when Somprasong Land, a property developer in Thailand, declared that it had not made a scheduled US $ 3.1 million interest payment on a US $ 80 billion Eurobond loan. Two weeks later, Finance One, Thailand's biggest financial institution declared bankruptcy. These two shocking announcements caused the Baht (Thailand's currency) to become unstable, and it depreciated greatly against the US dollar.

The Thailand government tried to stabilize the Baht as they had before, but failed to be able to peg the Baht at an exchange rate of around 25 Baht per US dollar. Officially, on July 2, 1997, Bank of Thailand (BOT) on behalf of the Thailand government allowed the Baht to float freely against the US dollar. The Baht decreased 20 percent in one day. As the Baht declined, Thailand's debt bomb exploded. This time the Baht's drop triggered and dispersed quickly as the financial crisis spread to Indonesia, Malaysia, and the Philippines. By October 1997, the crisis hit the Republic of Korea, Hong Kong, and China. The crisis was labeled "The Asian Financial Crisis."

During the crisis time in 1997–1998, countries confronted their first trouble with the loss of the value of their currencies against the US dollar. Many lost 40 percent of the value of their currencies, and nearly 70 percent of the value of their domestic stock markets.

Big exchange rate devaluations occurred throughout the crisis (Table 1.1.). Thailand, Indonesia, and the Republic of Korea (South Korea) were the countries most affected by the 1997-1998 Asian financial crisis. Indonesia's currency, Rupiah, was devaluated from 2,362.9 per US dollar on January 3, 1997 to 14,555 per US dollar on January 23, 1998. The Thai Baht declined from 25.7 per US dollar on January 3, 1997 to 53.2 on January 9, 1998; and the Republic of Korea's Won declined from 841.3 per US dollar on January 3, 1997 to 1,822.7 per US dollar on December 24, 1997 (Figures 1.1.; 1.2.; and 1.3.).

The 1997-1998 Asian financial crisis was Asia's worst economic turn down in the last 30 years. Before the crisis, Southeast Asian countries had enjoyed excellent economic accomplishment. In a short time period in 1997-1998, the Asian financial crisis caused sharp real exchange rate depreciation. The stock market value declined which brought about lower economic growth in Southeast Asian countries (Tables 1.2. and 1.3.). Consequences of the crisis included cuts in demand for imported goods, fewer exports, less private and government spending, the poverty rate increased (Table 1.4.), firms reduced production, and huge layoffs increased unemployment (Table 1.5.). All of these things define a recession.

Table 1.1. Exchanges Rate for Selected Asian Economies, 1997-1998

| Date | Indonesia (Rupiah) | Malaysia (Ringgit) | Philippine (Peso) | Thailand (Baht) | Hong Kong (Dollar) | Japan (Yen) | South Korea (Won) | Singapore (Dollar) |
|---|---|---|---|---|---|---|---|---|
| Jan 3, 97 | 2,362.9 | 2.52 | 26.25 | 25.7 | 7.74 | 116.32 | 841.3 | 1.40 |
| Jan 31, 97 | 2,371.2 | 2.49 | 26.33 | 25.9 | 7.75 | 121.20 | 863.1 | 1.41 |
| Feb 28, 97 | 2,391.4 | 2.48 | 26.31 | 25.8 | 7.74 | 120.82 | 862.1 | 1.42 |
| Mar 27, 97 | 2,396.2 | 2.48 | 26.34 | 26.0 | 7.75 | 123.62 | 892.0 | 1.45 |
| Apr 25, 97 | 2,429.9 | 2.51 | 26.35 | 26.1 | 7.74 | 126.04 | 890.7 | 1.44 |
| May 30, 97 | 2,430.4 | 2.51 | 26.35 | 24.9 | 7.75 | 116.43 | 889.7 | 1.43 |
| Jun 27, 97 | 2,430.9 | 2.52 | 26.35 | 24.0 | 7.75 | 114.72 | 885.9 | 1.43 |
| Jul 4, 97 | 2,432.3 | 2.52 | 26.40 | 28.4 | 7.74 | 113.85 | 887.2 | 1.44 |
| Jul 11, 97 | 2,439.3 | 2.50 | 27.00 | 29.6 | 7.75 | 113.92 | 888.2 | 1.44 |
| Jul 18, 97 | 2,515.0 | 2.64 | 27.99 | 30.2 | 7.75 | 115.39 | 893.0 | 1.47 |
| Jul 25, 97 | 2,603.6 | 2.64 | 28.50 | 31.9 | 7.74 | 116.77 | 890.1 | 1.47 |
| Aug 1, 97 | 2,620.9 | 2.64 | 28.90 | 32.1 | 7.74 | 118.40 | 887.6 | 1.48 |
| Aug 8, 97 | 2,604.3 | 2.69 | 28.30 | 30.9 | 7.74 | 114.91 | 892.7 | 1.48 |
| Aug 15, 97 | 2,850.1 | 2.78 | 29.60 | 31.8 | 7.74 | 117.72 | 893.0 | 1.52 |
| Aug 22, 97 | 2,678.0 | 2.77 | 29.60 | 33.5 | 7.74 | 117.01 | 898.1 | 1.49 |
| Aug 29, 97 | 2,943.6 | 2.92 | 30.10 | 34.0 | 7.75 | 120.74 | 899.9 | 1.51 |
| Sep 5, 97 | 2,916.5 | 2.94 | 31.79 | 34.8 | 7.75 | 120.93 | 904.0 | 1.52 |
| Sep 12, 97 | 2,925.9 | 2.97 | 32.00 | 35.3 | 7.74 | 121.05 | 907.0 | 1.51 |
| Sep 19, 97 | 2,960.7 | 3.03 | 33.19 | 35.7 | 7.74 | 122.04 | 912.1 | 1.52 |
| Sep 26, 97 | 3,085.7 | 3.14 | 33.31 | 34.7 | 7.74 | 120.74 | 912.7 | 1.52 |
| Oct 3, 97 | 3,716.8 | 3.37 | 34.60 | 35.4 | 7.74 | 121.91 | 911.9 | 1.54 |
| Oct 10, 97 | 3,392.8 | 3.11 | 32.89 | 35.7 | 7.74 | 119.93 | 912.8 | 1.54 |
| Oct 17, 97 | 3,561.8 | 3.24 | 33.50 | 37.1 | 7.74 | 120.20 | 913.0 | 1.55 |
| Oct 24, 97 | 3,534.7 | 3.39 | 35.00 | 38.7 | 7.73 | 121.96 | 927.1 | 1.55 |
| Oct 31, 97 | 3,579.4 | 3.34 | 35.00 | 40.0 | 7.73 | 120.34 | 960.0 | 1.57 |
| Nov 7, 97 | 3,283.9 | 3.30 | 34.60 | 38.3 | 7.73 | 124.18 | 974.7 | 1.57 |
| Nov 14, 97 | 3,432.4 | 3.31 | 33.60 | 38.3 | 7.73 | 126.91 | 982.3 | 1.58 |
| Nov 21, 97 | 3,541.7 | 3.42 | 34.00 | 38.7 | 7.73 | 125.82 | 1,051.0 | 1.58 |
| Nov 28, 97 | 3,645.9 | 3.50 | 34.65 | 40.6 | 7.73 | 127.62 | 1,169.0 | 1.60 |
| Dec 5, 97 | 4,012.0 | 3.75 | 34.90 | 41.4 | 7.74 | 130.16 | 1,228.0 | 1.62 |
| Dec 12, 97 | 4,972.4 | 3.81 | 37.71 | 45.0 | 7.75 | 130.46 | 1,704.8 | 1.65 |
| Dec 19, 97 | 4,987.5 | 3.82 | 39.00 | 44.7 | 7.75 | 129.00 | 1,576.5 | 1.67 |
| Dec 24, 97 | 5,611.6 | 3.82 | 39.70 | 45.2 | 7.75 | 129.88 | 1,822.7 | 1.67 |
| Jan 2, 98 | 5,985.0 | 3.95 | 40.80 | 48.0 | 7.75 | 132.44 | 1,695.5 | 1.69 |
| Jan 9, 98 | 8,643.9 | 4.60 | 43.90 | 53.2 | 7.75 | 131.59 | 1,811.5 | 1.77 |
| Jan 16, 98 | 8,502.9 | 4.18 | 41.21 | 51.7 | 7.74 | 129.16 | 1,608.7 | 1.73 |
| Jan 23, 98 | 14,555.0 | 4.55 | 43.61 | 53.7 | 7.75 | 126.00 | 1,764.6 | 1.77 |
| Jan 30, 98 | 10,398.0 | 4.16 | 42.49 | 52.7 | 7.74 | 126.97 | 1,514.6 | 1.71 |
| Feb 5, 98 | 9,599.0 | 3.93 | 40.34 | 48.5 | 7.74 | 123.63 | 1,597.4 | 1.66 |

Source: Congressional Research Service

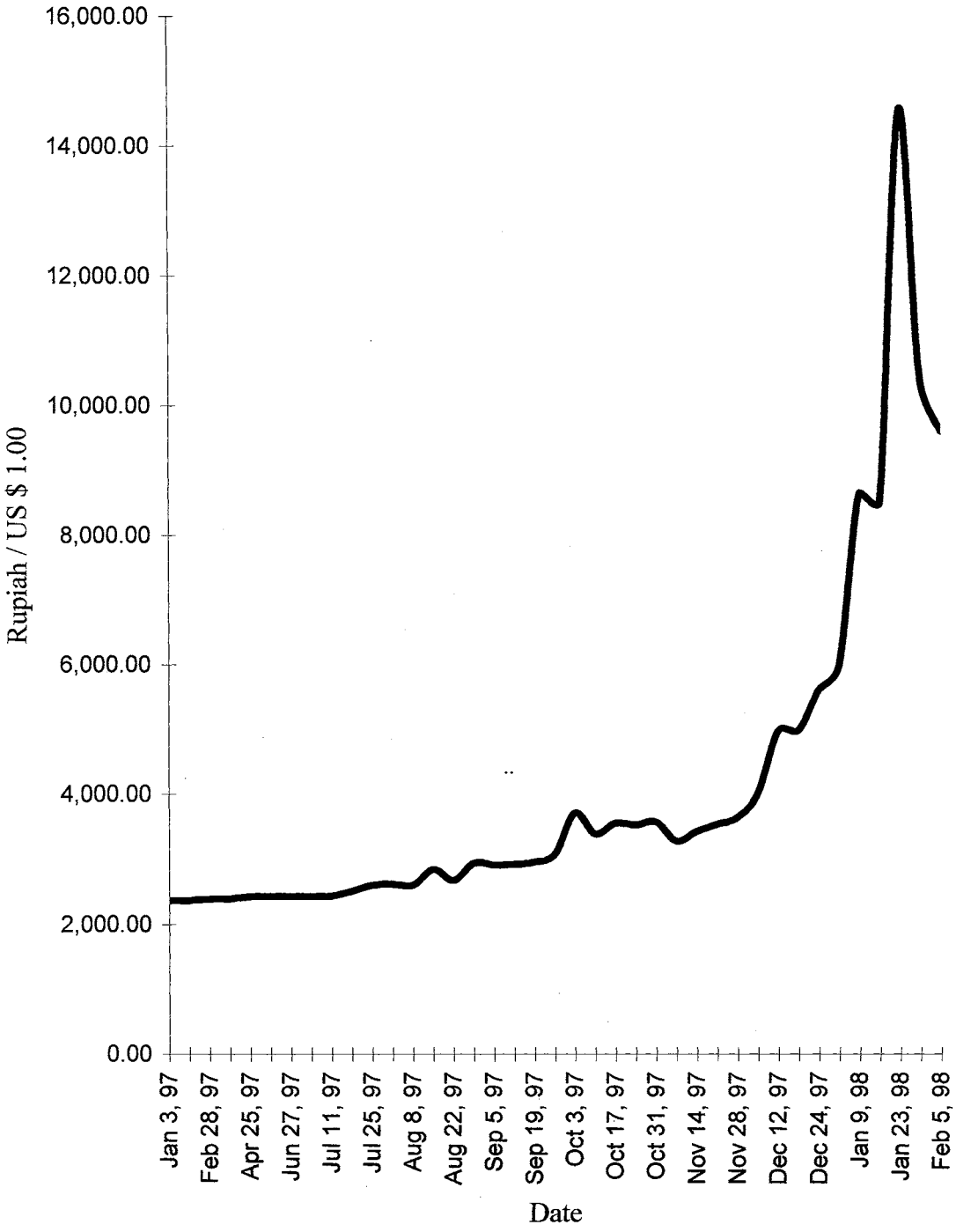


Figure 1.1. Indonesian Exchange Rate in Rupiah per US Dollar from January 3, 1997 to February 5, 1998

Source : Congressional Research Service

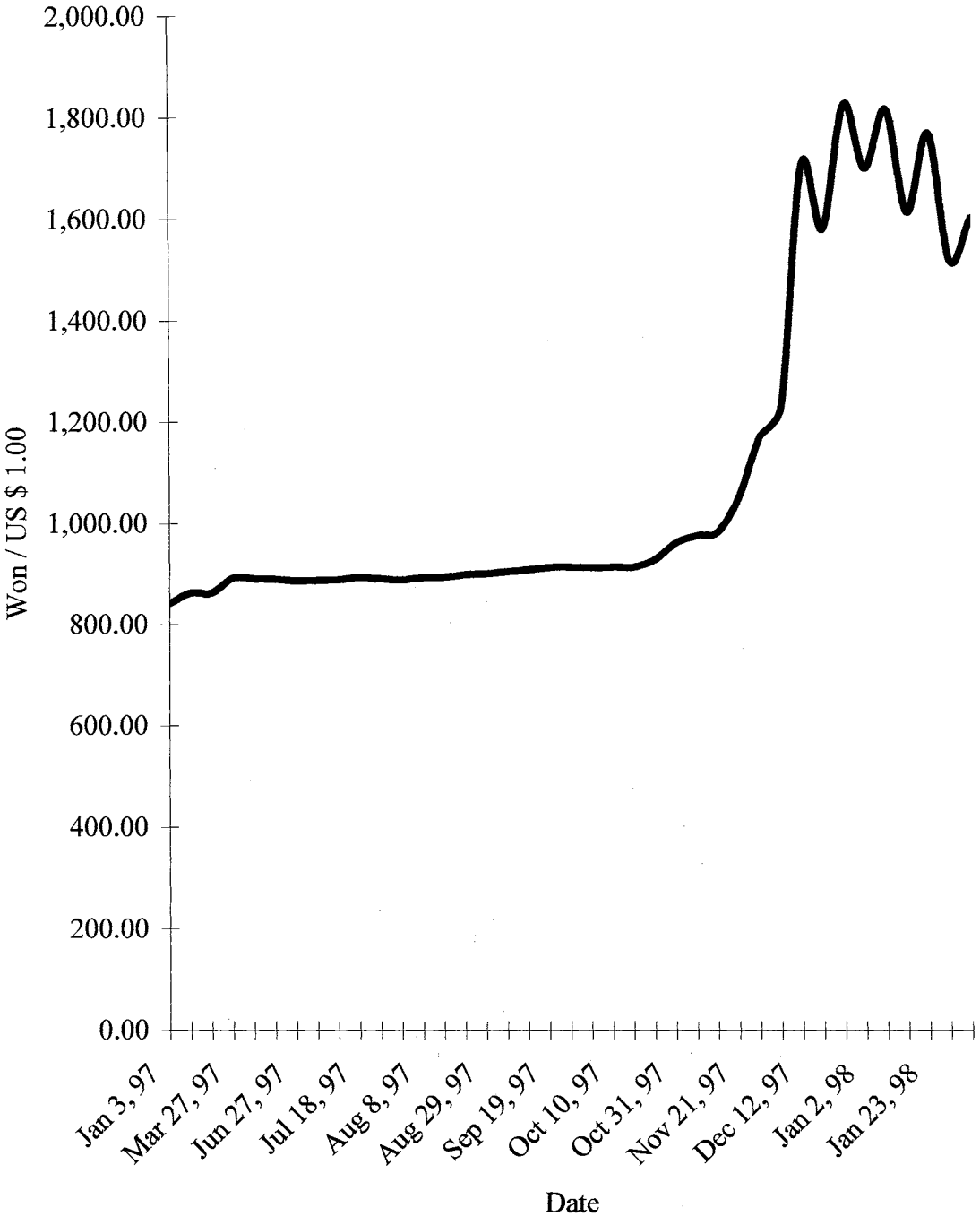


Figure 1.2. South Korean Exchange Rate in Won per US Dollar from January 3, 1997 to February 5, 1998

Source: Congressional Research Service

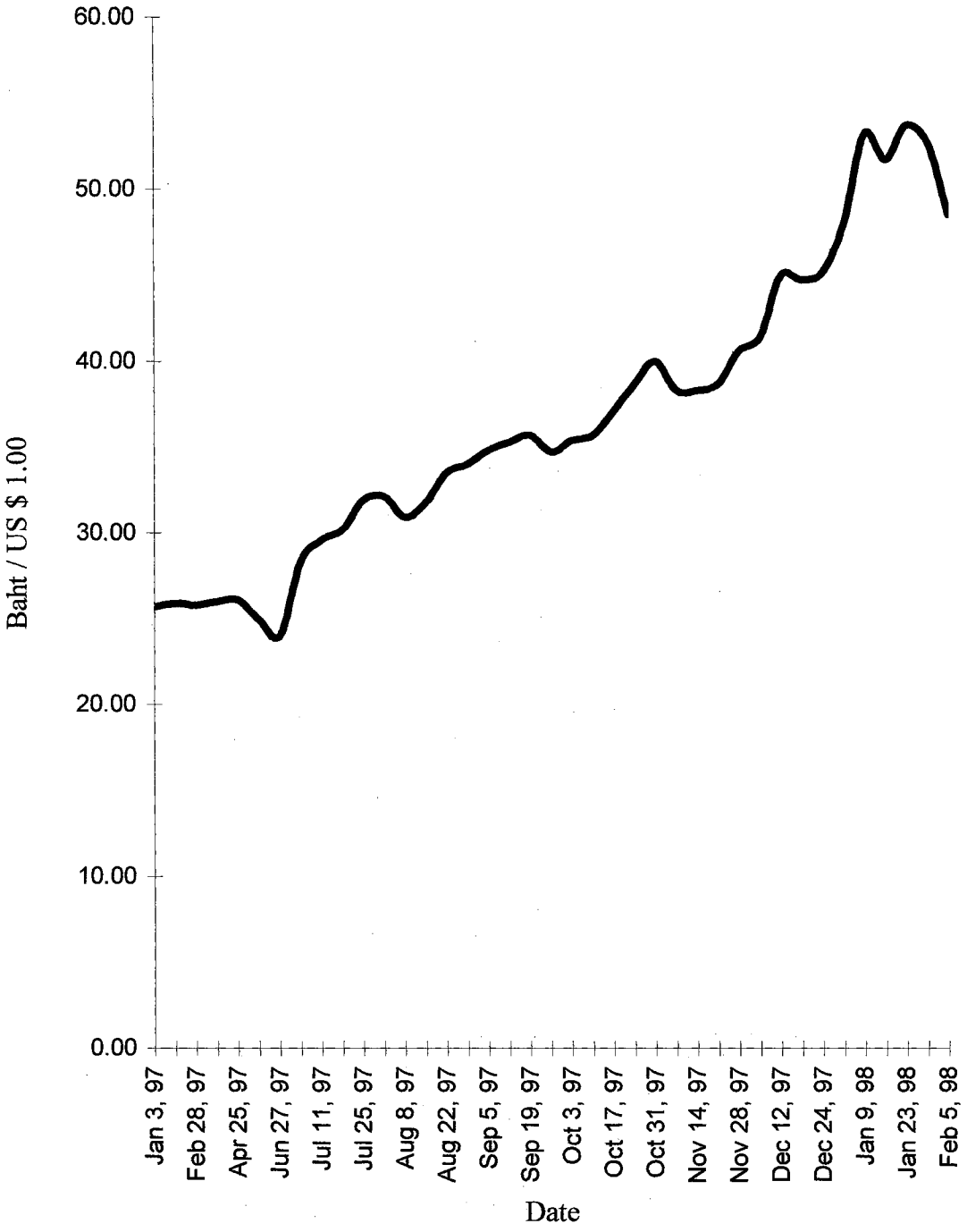


Figure 1.3. Thailand Exchange Rate in Baht per US Dollar from January 3, 1997 to February 5, 1998

Source: Congressional Research Service

Table 1.2. Annual Growth of Key Economies of Asian Countries, 1995-1999

| Country, Key Economies | 1995 | 1996 | 1997 | 1998* | 1999* |
|---|---|---|---|---|---|
| | | | ..... Percent ..... | | |
| Indonesia | | | | | |
| GDP | 8.2** | 8.0** | 2.2** | -13.0 | 0.3 |
| GNP Per capita | | | | -17.8 | 0.4 |
| Export | na | 9.7*** | 7.3*** | 11.2 | -31.6 |
| Agriculture | | | | -0.7 | 2.1 |
| Industry | | | | -14.0 | 1.2 |
| Services | | | | -16.4 | -1.4 |
| Private Consumption | | | | -6.3 | 3.7 |
| Gov. Consumption | | | | -15.4 | 0.7 |
| Gross Domestic Inv. | | | | -34.6 | -20.0 |
| Imports | | | | -5.3 | -40.7 |
| Domestic Consumer Prices | | | | 58.5 | 20.5 |
| Implicit GDP Deflator | | | | 81.2 | 12.8 |
| South Korea | | | | | |
| GDP | 9.0** | 7.1** | 5.5** | -6.7 | 10.7 |
| GNP Per capita | | | | -8.4 | 10.1 |
| Export | na | 3.7*** | 5.0*** | 13.2 | 16.3 |
| Agriculture | | | | -6.6 | 4.7 |
| Industry | | | | -7.5 | 13.0 |
| Services | | | | -6.0 | 9.4 |
| Private Consumption | | | | -11.3 | 9.4 |
| Gov. Consumption | | | | -0.4 | -0.6 |
| Gross Domestic Inv. | | | | -38.4 | 30.4 |
| Imports | | | | -22.4 | 28.9 |
| Domestic Consumer Prices | | | | 7.5 | 0.8 |
| Implicit GDP Deflator | | | | 5.1 | -1.6 |

Table 1.2. Continued

| Country, Key Economies | 1995 | 1996 | 1997 | 1998* | 1999* |
|---|---|---|---|---|---|
| | | | ..... Percent ..... | | |
| Malaysia | | | | | |
| GDP | 9.4** | 8.6** | 7.7** | -7.4 | 5.8 |
| GNP Per capita | | | | -7.4 | 1.6 |
| Export | na | 5.8*** | 0.7*** | 0.5 | 13.4 |
| Agriculture | | | | -3.3 | 3.3 |
| Industry | | | | -10.9 | 8.0 |
| Services | | | | -4.7 | 4.3 |
| Private Consumption | | | | -10.8 | 3.1 |
| Gov. Consumption | | | | -6.6 | 16.3 |
| Gross Domestic Inv. | | | | -43.0 | -5.1 |
| Imports | | | | -18.8 | 10.8 |
| Domestic Consumer Prices | | | | 5.3 | 2.8 |
| Implicit GDP Deflator | | | | 9.0 | -0.2 |
| Philippines | | | | | |
| GDP | na | na | na | -0.8 | 3.2 |
| GNP Per capita | | | | -2.0 | 1.3 |
| Export | na | 16.7*** | 22.9*** | -21.0 | 3.6 |
| Agriculture | | | | -7.3 | 6.2 |
| Industry | | | | -2.1 | 0.3 |
| Services | | | | 3.5 | 4.1 |
| Private Consumption | | | | 6.9 | 0.4 |
| Gov. Consumption | | | | -1.9 | 5.3 |
| Gross Domestic Inv. | | | | -16.3 | -2.9 |
| Imports | | | | -14.7 | -2.8 |
| Domestic Consumer Prices | | | | 9.8 | 6.6 |
| Implicit GDP Deflator | | | | 11.3 | 8.2 |

Table 1.2. Continued

| Country, Key Economies | 1995 | 1996 | 1997 | 1998* | 1999* |
|---|---|---|---|---|---|
| | | | .....Percent..... | | |
| Thailand | | | | | |
| GDP | 9.3** | 6.4** | -0.5** | -10.2 | 4.2 |
| GNP Per capita | | | | -11.6 | 4.1 |
| Export | na | -1.3*** | 3.3*** | 6.7 | 8.9 |
| Agriculture | | | | -1.4 | 2.6 |
| Industry | | | | -13.2 | 7.8 |
| Services | | | | -9.5 | 1.5 |
| Private Consumption | | | | -12.3 | 2.9 |
| Gov. Consumption | | | | 1.9 | 2.8 |
| Gross Domestic Inv. | | | | -49.3 | 12.6 |
| Imports | | | | -22.3 | 19.6 |
| Domestic Consumer Prices | | | | 8.1 | 0.3 |
| Implicit GDP Deflator | | | | 9.2 | -2.6 |

Note: na = not available

Source:

* = The World Bank Group
** = Haggard, 2000
*** = Woo, Sachs, Schwab, 2000

Table 1.3. The Effect of the 1997-1998 Asian Financial Crisis in Gross National Product (GNP) on Southeast Asian Countries

| Country | Gross National Product (GNP) | |
|---|---|---|
| | June 1997 | July 1998 |
| | ..... US $ Billion ..... | |
| Thailand | 170 | 102 |
| Indonesia | 205 | 34 |
| Philippines | 75 | 47 |
| Malaysia | 90 | 55 |
| South Korea | 430 | 283 |

Source: Jackson, 1999

Table 1.4. Increased Poverty Due to the 1997-1998 Asian Financial Crisis in Indonesia, Thailand, and South Korea (1998 Forecast)

| Country | 1998 Forecast | | | | | |
|---|---|---|---|---|---|---|
| | Increase in the Number of Poor | | Due to Unemployment | | Due to Inflation | |
| | (Millions) | % of Population | (Millions) | % of Total Increase | (Millions) | % of Total Increase |
| Indonesia | 39.9 | 20.0 | 12.3 | 30.8 | 27.6 | 69.2 |
| South Korea | 5.5 | 12.0 | 4.7 | 85.5 | 0.8 | 14.5 |
| Thailand | 6.7 | 12.0 | 5.4 | 80.6 | 1.3 | 19.4 |

Source: Lee, 1998

Table 1.5. Number of Unemployment before and after the 1997-1998 Asian Financial Crisis in Indonesia, Thailand, Malaysia, and Hong Kong

| Country | Pre Crisis 1997 | | Post Crisis (Estimate and Forecast) | | |
|---|---|---|---|---|---|
| | Unemployment (000) | Unemployment Rate (%) | Unemployment (000) | Absolute Increases (000) | Unemployment Rate (%) |
| Indonesia | 4,300 | 4.9 | 9,300 to 13,700 | 5,000 to 9,400 | 7.2 to 14.8 |
| Thailand | 698 | 2.2 | 1,987 | 1,289 | 6.0 |
| Malaysia | 224 | 2.6 | 405 | 181 | 5.2 |
| Hong Kong | 77 | 2.4 | 152 | 75 | 4.6 |

Source: Lee, 1998

Many analysts have studied the root cause of the 1997-1998 Asian financial crisis. Lee (1998) suggested the origins of the crisis included crony capitalism and corruption, subversion of democracy, subversion of the law, social injustice and the failure of the Asian model to follow principles of free market economics. Give away privatizations to relatives and cronies of the political leadership were common. Artificial monopoly rights were granted. Government directed credit toward political allies, which resulted in misallocations of capital and a lower return on capital. Corruption, lack of transparency in economic management, and excess interventionism are common in the government.

Jackson (1999) suggested that the excessive borrowing from abroad, especially by the private sector, is the hallmark of the crisis. Five years before the crisis, the borrowings of banks and non-banks had grown rapidly. Total external indebtedness reached US $ 43.74 billion in Thailand, and US $ 34.71 billion in Indonesia (Table 1.6.). Other possible causes of the crisis were fixed exchange rates that were used across the region by governments to minimize the foreign exchange rate variation for domestic borrowers and foreign investors which resulted in overvalued currencies. Inadequate supervisory institutions, poor investment decisions, weak banks, real estate speculation, and political uncertainty are other factors contributing to the crisis.

To stabilize its financial systems, Indonesia, South Korea, and Thailand have received funding from the International Monetary Fund (IMF). Thailand asked for US $ 17.2 billion from International Monetary Fund (IMF) in August 1997. In October 1997, Indonesia requested US $ 40 billion from IMF. The IMF requested some reforms from the Indonesian government to eliminate subsidies and tax breaks to monopolies. In November 1997, South Korea requested IMF aid of US $ 57 billion (Table 1.7.). The

Table 1.6. The Short Term Debt of the Asian Countries (US $ Billions)

| Year | Thailand | Indonesia | South Korea | Malaysia | Philippines | Singapore | Hong Kong | China |
|---|---|---|---|---|---|---|---|---|
| | | | ..... US $ Billions ..... | | | | | |
| 1995 | 60.56 | 25.97 | 47.63 | 7.27 | 5.28 | 1.22 | 7.85 | 34.40 |
| 1996 | 58.33 | 32.23 | 54.66 | 11.07 | 7.97 | 2.00 | 14.26 | 38.09 |
| 1997 | 43.74 | 34.71 | 59.65* | 10.21 | 8.45* | 2.00* | 15.02* | 43.81* |
| 1998** | 33.68 | 30.19 | 28.19 | 9.75 | 7.95 | 2.00 | 14.84 | 48.63 |
| 1999** | 34.92 | 31.39 | 23.02 | 10.10 | 8.25 | 2.10 | 14.79 | 54.46 |

Note: * = estimate
** = forecast

Source: Lee, 1998

International Monetary Fund (IMF) asked the South Korea government to apply free market reforms including opening its market for foreign investment and ownership.

## 1.2. Problems

Social disruptions and unrest, decreases in output, decreases in income, massive job losses (due to further bankruptcies and cutbacks in production), and increased inflation became even more alarming as the crisis progressed (Lee, 1998). Increasing food prices became major issues in South Asian countries, as shown in Table 1.2., which Indonesia's annual domestic growth in consumer prices in 1998 was 58.5 percent while it was 5.3 percent for Malaysia.

Palm oil is one of the nine essential commodities in Indonesia. It is an important source for cooking oil in Indonesia and Malaysia. Palm oil became an important policy focus, as its prices increased 80 percent to 134 percent between July 1997 and April 1998 in Indonesia (Table 1.8. and Figure 1.4.). In some of Indonesia's regions during the crisis, the cooking oil price increased from 1,678 Rupiah per kilogram to 7,655 Rupiah per kilogram. In Indonesia, the increasing price of cooking oil, rice and other essential commodities caused social turmoil and unrest. To calm the social situation in Indonesia, the Indonesian government intervened in the domestic cooking oil industry. The government set policies in the palm oil and palm kernel oil industry to decrease and control the cooking oil price, and to make sure the quantity of cooking oil needed was available in the market. During the crisis, a range of export tariff rates, and export controls in palm oil and palm kernel oil industry were applied. A key issue is whether

Table 1.7. The International Monetary Fund (IMF) Financial Support Packages

| | Thailand | Indonesia | South Korea |
|---|---|---|---|
| | | .....US $ Billion..... | |
| Total Pledged | 17.2 | 40.0 | 57.0 |
| IMF | 3.9 | 10.1 | 21.0 |
| US | 0.0 | 3.0 | 5.0 |
| World Bank | 1.5 | 4.5 | 10.0 |
| Asian Dev. | 1.2 | 3.5 | 4.0 |
| Bank Japan | 4.0 | 5.0 | 10.0 |
| Others | 6.6 | 26.0 | 7.0 |
| Change in Exchange Rate (7/11/97 – 1/22/98) | -38% | -81% | -50% |
| Change in Stock Market (7/1/97 – 1/19/98) | -26% | -40% | -30% |

Source: Congressional Research Service

Table 1.8. Price Increase of the Nine Essential Commodities in Indonesia, July 1997 – April 1998

| Commodity | Java Island | Non Java Island |
|---|---|---|
| | ..... Percent ..... | |
| Rice | 50 | 37 |
| Salted Fish | 56 | 42 |
| Palm Oil | 134 | 80 |
| Granulated sugar | 36 | 31 |
| Salt | 66 | 32 |
| Kerosene | 8 | 6 |
| Washing soap | 77 | 72 |
| Textiles | 38 | 39 |
| Batiks | 25 | 30 |
| General | 51 | 39 |

Source: Country Commercial Guides

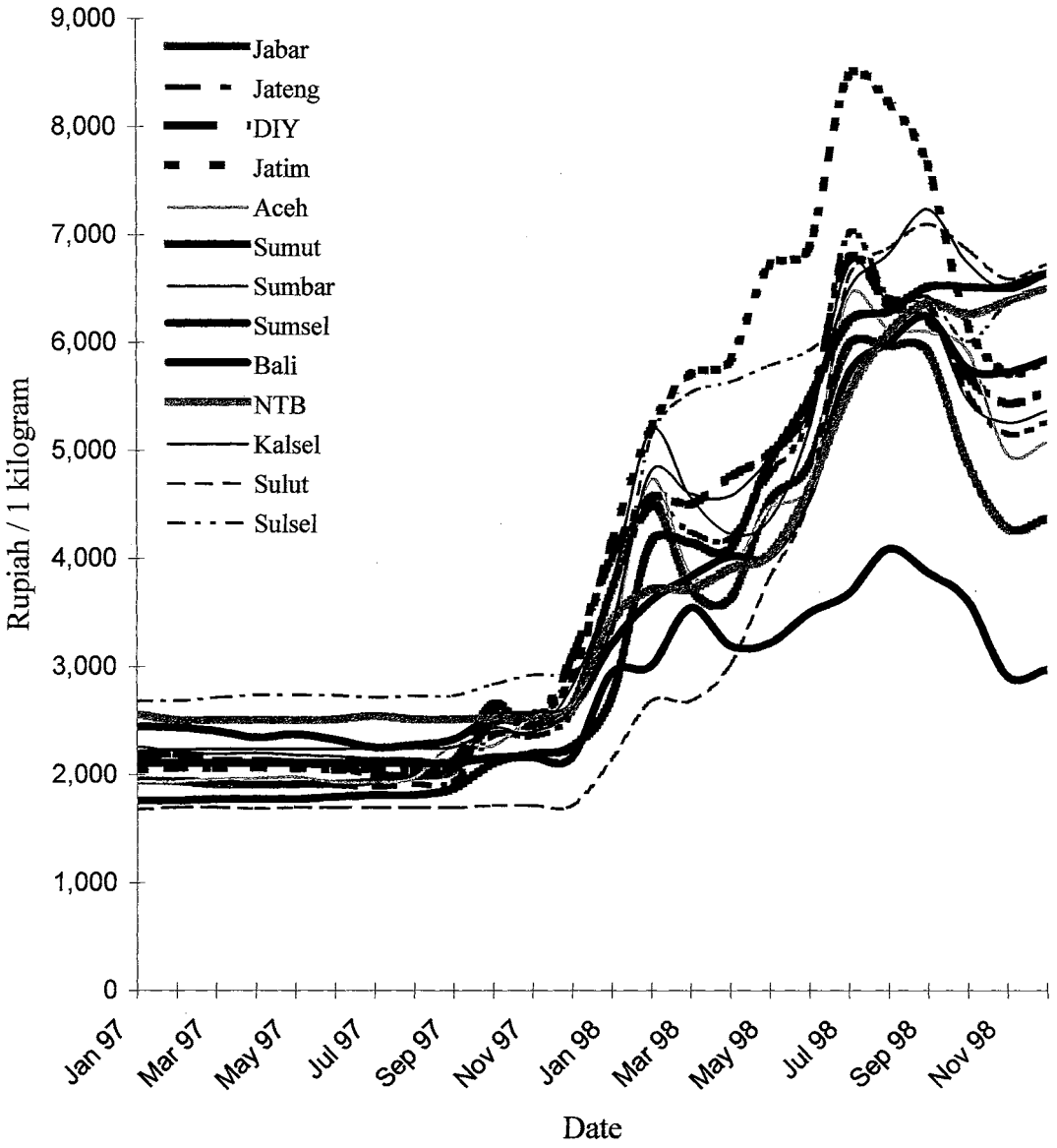


Figure 1.4. Cooking Oil Prices in Indonesian Provinces, 1997-1998

Source: Deptan

the policies helped control prices of cooking oil in Indonesia. Different from Indonesia, during the crisis, the prices of cooking oil in Malaysia were stable. Because of its stability, the Malaysian government did not intrude its cooking oil, palm oil and palm kernel oil industries.

Indonesia is the world's second largest producer of palm oil and palm kernel oil products following Malaysia. Consequently, Malaysia will take the best actions to expand and maintain its palm oil and palm kernel oil industry, and market its products based on the policies of the Indonesian government did in its palm oil and palm kernel oil industry/market.

## 1.3. Objectives

The objectives of this research are:

1. To describe the world palm oil and palm kernel oil industry from 1997 to 1999 and the condition of palm oil and palm kernel oil industry in Indonesia and Malaysia during, and after the 1997-1998 Asian financial crisis.
2. To describe the political and economic policies that were applied by the Indonesian and Malaysian government to handle the crisis particularly in their palm oil and palm kernel oil industry in 1997 to 1999.
3. To determine the impact of 1997-1998 Asian financial crisis on palm oil and palm kernel oil industry in Indonesia and Malaysia by evaluating the effect of Indonesian palm oil and palm kernel oil policies on palm oil and palm kernel oil prices in Indonesia and Malaysia.

## 1.4. Organization of the Study

The study includes eight chapters. Chapter two depicts the palm oil and palm kernel oil industries in Indonesia and Malaysia. Chapter three describes political and economic policies. Chapter four describes government policies affecting the palm oil and palm kernel oil industry. Chapter five describes theory and previous empirical work. Chapter six explains data, methodology, and empirical results and chapter seven describes summary and conclusions.

# CHAPTER II

## PALM OIL AND PALM KERNEL OIL INDUSTRY

Palm oil and palm kernel oil products are an important nutritional source for human consumption and for industrial use. Palm oil and palm kernel oil are two of the 17 categories of oils and fats. World opening stocks of 17 oils and fats increased from 11,290,000 metric tons in 1994 to 12,960,000 metric tons in 1999 (Table 2.1.), which world average opening stocks in 1999 was 2,854,000 metric tons in palm oil and 240,500 metric tons in palm kernel oil. World palm oil and palm kernel oil production varied, between 14,304,000 and 20,277,000 metric tons of palm oil from 1994 to 1999, and between 1,861,000 to 2,518,000 metric tons for palm kernel oil (Table 2.2.). World's production of palm oil increased an average of 5.5 percent per year; and 7.1 percent per year for palm kernel oil from 1994 to 1999. The world price of palm oil was between US $ 308.8 and US $ 723.8 per metric ton, which the price of palm kernel oil varied from US $ 580.0 to US $ 780.0 per metric ton (Figure 2.1.)

In 1999, world imports were 13,581,000 metric tons of palm oil and 1,260,000 metric tons of palm kernel oil, while in 1994 only 10,614,000 metric tons for palm oil and 896,000 metric tons of palm kernel oil were imported (Table 2.3.). World exports of

Table 2.1. World Opening Stock of 17 Oils and Fats (1,000 Metric Tons), 1994-1999

| Oils/Fats | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|
| | | | ..... 000 Metric Tons ..... | | | |
| Vegetable Oils | | | | | | |
| Palm oil | 2,910 | 2,265 | 2,881 | 3,139 | 3,250 | 2,679 |
| Palm kernel oil | 272 | 193 | 210 | 241 | 263 | 264 |
| Soybean oil | 2,211 | 2,028 | 2,713 | 2,841 | 2,565 | 2,623 |
| Cottonseed oil | 323 | 356 | 407 | 394 | 434 | 386 |
| Groundnut oil | 350 | 366 | 488 | 529 | 495 | 495 |
| Sunflower oil | 989 | 1,091 | 1,187 | 1,343 | 1,244 | 1,204 |
| Rapeseed oil | 719 | 985 | 1,270 | 1,202 | 1,290 | 1,301 |
| Corn oil | 133 | 126 | 182 | 154 | 143 | 154 |
| Coconut oil | 417 | 428 | 461 | 401 | 483 | 584 |
| Olive oil | 829 | 685 | 557 | 651 | 1,074 | 1,227 |
| Castor oil | 68 | 72 | 85 | 88 | 70 | 64 |
| Sesame oil | 45 | 46 | 48 | 45 | 46 | 45 |
| Linseed oil | 75 | 83 | 92 | 96 | 86 | 102 |
| Total | 9,341 | 8,724 | 10,581 | 11,124 | 11,447 | 11,128 |
| Animal oils/fats | | | | | | |
| Butter | 819 | 688 | 663 | 670 | 593 | 600 |
| Tallow | 542 | 555 | 613 | 493 | 576 | 590 |
| Fish oil | 261 | 413 | 310 | 269 | 223 | 177 |
| Lard | 327 | 391 | 453 | 441 | 465 | 465 |
| Total | 1,949 | 2,047 | 2,039 | 1,873 | 1,857 | 1,832 |
| Grand total | 11,290 | 10,771 | 12,620 | 12,997 | 13,300 | 12,960 |

Source: Malaysian Palm Oil Board, 2000

Table 2.2. World Production of 17 Oils and Fats: 1994-1999 (1,000 Metric Tons)

| Oils/Fats | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|
| | | | ..... 000 Metric Tons ..... | | | |
| Vegetable Oils | | | | | | |
| Palm oil | 14,304 | 15,447 | 16,643 | 17,861 | 16,711 | 20,277 |
| Palm kernel oil | 1,861 | 1,948 | 2,086 | 2,223 | 2,163 | 2,518 |
| Soybean oil | 18,684 | 20,426 | 20,324 | 21,034 | 24,006 | 24,755 |
| Cottonseed oil | 3,566 | 3,901 | 4,127 | 4,045 | 4,048 | 3,811 |
| Groundnut oil | 4,309 | 4,397 | 4,497 | 4,446 | 4,546 | 4,705 |
| Sunflower oil | 7,391 | 8,572 | 9,032 | 9,206 | 8,546 | 9,237 |
| Rapeseed oil | 9,970 | 10,952 | 11,486 | 11,841 | 12,220 | 12,936 |
| Corn oil | 1,675 | 1,851 | 1,828 | 1,879 | 1,930 | 1,989 |
| Coconut oil | 3,015 | 3,350 | 2,867 | 3,321 | 3,205 | 2,499 |
| Olive oil | 1,900 | 1,888 | 2,042 | 2,682 | 2,581 | 2,425 |
| Castor oil | 446 | 483 | 479 | 453 | 438 | 433 |
| Sesame oil | 616 | 589 | 642 | 692 | 724 | 689 |
| Linseed oil | 636 | 701 | 662 | 678 | 697 | 721 |
| Total | 68,373 | 74,505 | 76,715 | 80,361 | 81,815 | 86,995 |
| Animal oils/fats | | | | | | |
| Butter | 5,677 | 5,717 | 5,678 | 5,697 | 5,744 | 5,819 |
| Tallow | 7,550 | 7,510 | 7,417 | 7,490 | 7,737 | 8,133 |
| Fish oil | 1,490 | 1,318 | 1,368 | 1,214 | 849 | 1,201 |
| Lard | 5,430 | 5,689 | 5,911 | 6,032 | 6,469 | 6,609 |
| Total | 20,147 | 20,234 | 20,374 | 20,433 | 20,799 | 21,762 |
| Grand total | 88,520 | 94,739 | 97,089 | 100,794 | 102,614 | 108,757 |

Source: Malaysian Palm Oil Board, 2000

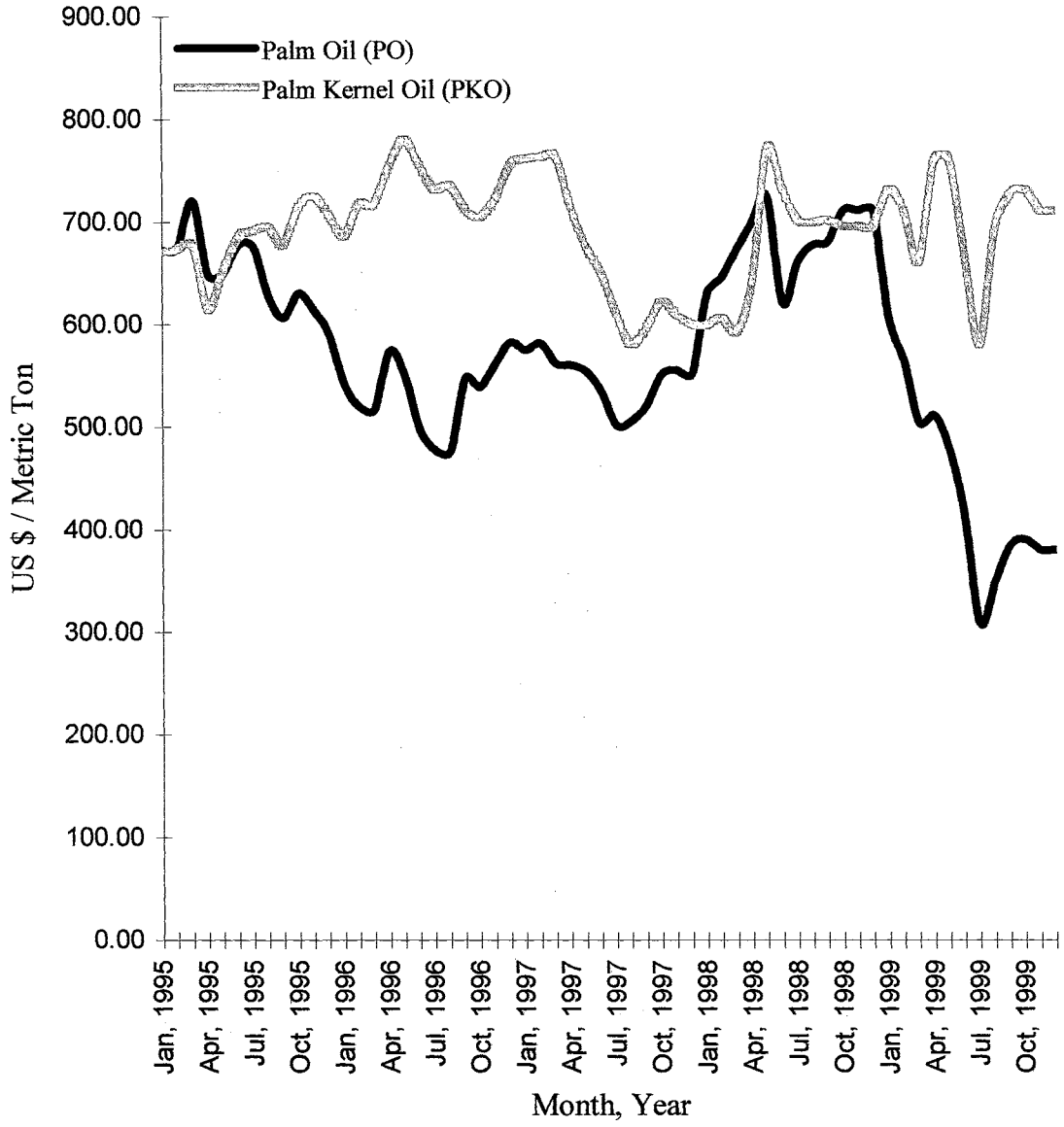


Figure 2.1. World Prices of Palm Oil (PO) and Palm Kernel Oil (PKO)

Source: Badan Pusat Statistik, Database

Table 2.3. World Import of 17 Oils and Fats: 1994-1999 (1,000 Metric Tons)

| Oils/Fats | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|
| | | | ..... 000 Metric Tons ..... | | | |
| Vegetable Oils | | | | | | |
| Palm oil | 10,614 | 10,341 | 10,717 | 12,052 | 11,160 | 13,581 |
| Palm kernel oil | 896 | 796 | 930 | 1,032 | 1,059 | 1,260 |
| Soybean oil | 4,693 | 5,439 | 5,175 | 6,877 | 7,739 | 7,702 |
| Cottonseed oil | 232 | 282 | 236 | 233 | 215 | 166 |
| Groundnut oil | 269 | 262 | 232 | 253 | 252 | 228 |
| Sunflower oil | 2,006 | 2,995 | 2,618 | 3,414 | 2,801 | 2,953 |
| Rapeseed oil | 1,778 | 1,897 | 1,859 | 1,898 | 2,208 | 1,795 |
| Corn oil | 484 | 631 | 613 | 685 | 805 | 689 |
| Coconut oil | 1,571 | 1,653 | 1,406 | 1,832 | 1,955 | 1,174 |
| Olive oil | 443 | 405 | 318 | 506 | 475 | 574 |
| Castor oil | 196 | 296 | 259 | 238 | 243 | 231 |
| Sesame oil | 23 | 22 | 22 | 23 | 21 | 25 |
| Linseed oil | 132 | 191 | 128 | 135 | 116 | 131 |
| Total | 23,337 | 25,210 | 24,513 | 29,178 | 29,049 | 30,509 |
| Animal oils/fats | | | | | | |
| Butter | 629 | 610 | 549 | 629 | 602 | 588 |
| Tallow | 2,254 | 2,570 | 2,176 | 1,990 | 2,340 | 2,318 |
| Fish oil | 789 | 906 | 786 | 716 | 421 | 690 |
| Lard | 170 | 182 | 141 | 152 | 165 | 214 |
| Total | 3,842 | 4,268 | 3,652 | 3,487 | 3,528 | 3,810 |
| Grand total | 27,179 | 29,478 | 28,165 | 32,665 | 32,577 | 34,319 |

Source: Malaysian Palm Oil Board, 2000

palm oil and palm kernel oil increased by 26.5 percent from 1994 to 1999 (Table 2.4.), of which world palm oil export increased from 10,760,000 metric tons to 13,527,000 metric tons, and volume of palm kernel oil increased from 890,000 metric tons to 1,213,000 metric tons.

World palm oil and palm kernel oil disappearance increased from 14,803,000 metric tons of palm oil in 1994 to 19,415,000 metric tons in 1999, and from 1,946,000 metric tons to 2,554,000 metric tons for palm kernel oil (Table 2.5.). The world ending stocks of palm oil was between 2,265,000 and 3,595,000 metric tons while palm kernel oil stocks ranged from 193,000 to 275,000 metric tons (Table 2.6.).

Malaysia and Indonesia are the world's first and second largest producers and exporters of palm oil and palm kernel oil. In 1999, Malaysia produced 10,554,000 metric tons of palm oil, a 46.2 percent increase from production from 1994, while Indonesia produced 6,060,000 metric tons a 51.2 percent increase since 1994 (Table 2.7.). Combined, Indonesia and Malaysia produced 82 percent of the world palm oil in 1999.

In 1999, 8,802,000 metric tons of palm oil was exported by Malaysia (Table 2.8.), which was 83.4 percent of its production, and Indonesia exported 52.5 percent of its production (3,183,000 metric tons). Europe was the major importer of palm oil followed by China and India (Table 2.9.).

## 2.1. Palm Oil Tree

Palm oil trees (*Elaeis Guinnesis)* are a perennial crop and were found first in West Africa. The trees were planted in other parts of Africa, South East Asia, and Latin

Table 2.4. World Export of 17 Oils and Fats: 1994-1999 (1,000 Metric Tons)

| Oils/Fats | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|
| | | | ..... 000 Metric Tons ..... | | | |
| Vegetable Oils | | | | | | |
| Palm oil | 10,760 | 10,173 | 10,715 | 12,117 | 10,812 | 13,527 |
| Palm kernel oil | 890 | 793 | 930 | 1,048 | 1,007 | 1,213 |
| Soybean oil | 4,786 | 5,691 | 4,951 | 6,773 | 7,986 | 7,545 |
| Cottonseed oil | 254 | 272 | 230 | 230 | 227 | 155 |
| Groundnut oil | 253 | 266 | 238 | 251 | 254 | 243 |
| Sunflower oil | 1,996 | 2,962 | 2,651 | 3,380 | 2,781 | 2,981 |
| Rapeseed oil | 1,852 | 1,898 | 1,780 | 1,907 | 2,222 | 1,682 |
| Corn oil | 504 | 598 | 592 | 692 | 799 | 658 |
| Coconut oil | 1,481 | 1,704 | 1,390 | 1,921 | 1,857 | 1,104 |
| Olive oil | 443 | 385 | 305 | 512 | 483 | 568 |
| Castor oil | 188 | 302 | 263 | 230 | 245 | 235 |
| Sesame oil | 23 | 22 | 23 | 23 | 22 | 22 |
| Linseed oil | 122 | 188 | 138 | 130 | 120 | 136 |
| Total | 23,552 | 25,254 | 24,206 | 29,214 | 28,815 | 30,069 |
| Animal oils/fats | | | | | | |
| Butter | 628 | 574 | 549 | 632 | 583 | 593 |
| Tallow | 2,254 | 2,553 | 2,148 | 1,994 | 2,331 | 2,289 |
| Fish oil | 823 | 895 | 771 | 739 | 429 | 685 |
| Lard | 179 | 179 | 146 | 143 | 160 | 208 |
| Total | 3,884 | 4,201 | 3,614 | 3,508 | 3,503 | 3,775 |
| Grand total | 27,436 | 29,455 | 27,820 | 32,722 | 32,318 | 33,844 |

Source: Malaysian Palm Oil Board, 2000

Table 2.5. Disappearance of 17 Oils and Fats from the World Market: 1994-1999 (1,000 Metric Tons)

| Oils/Fats | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|
| | | | ..... 000 Metric Tons ..... | | | |
| Vegetable Oils | | | | | | |
| Palm oil | 14,803 | 14,999 | 16,387 | 17,685 | 17,630 | 19,415 |
| Palm kernel oil | 1,946 | 1,934 | 2,055 | 2,185 | 2,214 | 2,554 |
| Soybean oil | 18,774 | 19,489 | 20,420 | 21,414 | 23,701 | 24,619 |
| Cottonseed oil | 3,511 | 3,860 | 4,146 | 4,008 | 4,084 | 3,820 |
| Groundnut oil | 4,309 | 4,271 | 4,450 | 4,482 | 4,544 | 4,725 |
| Sunflower oil | 7,299 | 8,509 | 8,843 | 9,339 | 8,606 | 9,155 |
| Rapeseed oil | 9,630 | 10,666 | 11,633 | 11,744 | 12,195 | 12,917 |
| Corn oil | 1,662 | 1,828 | 1,877 | 1,883 | 1,925 | 1,988 |
| Coconut oil | 3,094 | 3,266 | 2,943 | 3,150 | 3,202 | 2,804 |
| Olive oil | 2,044 | 2,036 | 1,961 | 2,253 | 2,420 | 2,436 |
| Castor oil | 450 | 464 | 472 | 479 | 442 | 428 |
| Sesame oil | 615 | 587 | 644 | 691 | 724 | 689 |
| Linseed oil | 638 | 695 | 648 | 693 | 677 | 703 |
| Total | 68,775 | 72,604 | 76,479 | 80,006 | 82,364 | 86,253 |
| Animal oils/fats | | | | | | |
| Butter | 5,809 | 5,778 | 5,671 | 5,771 | 5,756 | 5,802 |
| Tallow | 7,537 | 7,469 | 7,565 | 7,403 | 7,732 | 8,188 |
| Fish oil | 1,304 | 1,432 | 1,424 | 1,237 | 887 | 1,159 |
| Lard | 5,357 | 5,630 | 5,918 | 6,017 | 6,474 | 6,637 |
| Total | 20,007 | 20,309 | 20,578 | 20,428 | 20,849 | 21,786 |
| Grand total | 88,782 | 92,913 | 97,057 | 100,434 | 103,213 | 108,039 |

Source: Malaysian Palm Oil Board, 2000

Table 2.6. World Ending Stock of 17 Oils and Fats: 1994-1999 (1,000 Metric Tons)

| Oils/Fats | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|
| | | | ..... 000 Metric Tons ..... | | | |
| Vegetable Oils | | | | | | |
| Palm oil | 2,265 | 2,881 | 3,139 | 3,250 | 2,679 | 3,595 |
| Palm kernel oil | 193 | 210 | 241 | 263 | 264 | 275 |
| Soybean oil | 2,028 | 2,713 | 2,841 | 2,565 | 2,623 | 2,916 |
| Cottonseed oil | 356 | 407 | 394 | 434 | 386 | 388 |
| Groundnut oil | 366 | 488 | 529 | 495 | 495 | 460 |
| Sunflower oil | 1,091 | 1,187 | 1,343 | 1,244 | 1,204 | 1,258 |
| Rapeseed oil | 985 | 1,270 | 1,202 | 1,290 | 1,301 | 1,433 |
| Corn oil | 126 | 182 | 154 | 143 | 154 | 186 |
| Coconut oil | 428 | 461 | 401 | 483 | 584 | 349 |
| Olive oil | 685 | 557 | 651 | 1,074 | 1,227 | 1,222 |
| Castor oil | 72 | 85 | 88 | 70 | 64 | 65 |
| Sesame oil | 46 | 48 | 45 | 46 | 45 | 48 |
| Linseed oil | 83 | 92 | 96 | 86 | 102 | 115 |
| Total | 8,724 | 10,581 | 11,124 | 11,443 | 11,128 | 12,310 |
| Animal oils/fats | | | | | | |
| Butter | 688 | 663 | 670 | 593 | 600 | 612 |
| Tallow | 555 | 613 | 493 | 576 | 590 | 564 |
| Fish oil | 413 | 310 | 269 | 223 | 177 | 224 |
| Lard | 391 | 453 | 441 | 465 | 465 | 443 |
| Total | 2,047 | 2,039 | 1,873 | 1,857 | 1,832 | 1,843 |
| Grand total | 10,771 | 12,620 | 12,997 | 13,300 | 12,960 | 14,153 |

Source: Malaysian Palm Oil Board, 2000

Table 2.7. World's Major Producers of Palm Oil: 1994-1999 (1,000 Metric Tons)

| Country | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|
| | | | ..... 000 Metric Tons ..... | | | |
| Malaysia | 7,221 | 7,811 | 8,386 | 9,069 | 8,320 | 10,554 |
| Indonesia | 4,008 | 4,480 | 4,899 | 5,385 | 5,006 | 6,060 |
| Nigeria | 640 | 660 | 670 | 680 | 690 | 720 |
| Colombia | 353 | 387 | 410 | 441 | 500 | 424 |
| Cote D'Ivoire | 300 | 285 | 280 | 240 | 275 | 282 |
| Thailand | 316 | 354 | 375 | 390 | 355 | 410 |
| Papua New Guinea | 225 | 223 | 272 | 275 | 215 | 270 |
| Equador | 178 | 180 | 188 | 203 | 200 | 220 |
| Costa Rica | 90 | 97 | 109 | 109 | 103 | 105 |
| Honduras | 76 | 76 | 76 | 77 | 74 | 75 |
| Brazil | 71 | 76 | 80 | 80 | 89 | 90 |
| Venezuela | 34 | 44 | 45 | 46 | 48 | 46 |
| Guatemala | 22 | 25 | 36 | 50 | 51 | 53 |
| Others | 770 | 779 | 817 | 816 | 785 | 968 |
| TOTAL | 14,304 | 15,477 | 16,643 | 17,861 | 16,711 | 20,277 |

Source: Malaysian Palm Oil Board, 2000

Table 2.8. World's Major Exporters of Palm Oil: 1994-1999 (1,000 Metric Tons)

| Country | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|
| | | | ..... 000 Metric Tons ..... | | | |
| Malaysia | 6,750 | 6,513 | 7,212 | 7,490 | 7,425 | 8,802 |
| Indonesia | 2,173 | 1,856 | 1,851 | 2,982 | 2,082 | 3,183 |
| Papua New Guinea | 231 | 220 | 267 | 275 | 213 | 264 |
| Cote D'Ivoire | 148 | 120 | 99 | 73 | 83 | 75 |
| Colombia | 20 | 21 | 29 | 61 | 67 | 101 |
| Singapore* | 328 | 399 | 289 | 298 | 241 | 270 |
| Hong Kong* | 234 | 275 | 305 | 173 | 103 | 94 |
| Others* | 876 | 769 | 663 | 765 | 598 | 738 |
| TOTAL | 10,760 | 10,173 | 10,715 | 12,117 | 10,812 | 13,527 |

Note: * = Includes Re-exporting Countries

Source: Malaysian Palm Oil Board, 2000

Table 2.9. World's Major Importers of Palm Oil: 1994-1999 (1,000 Metric Tons)

| Country | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|
| | | | ..... 000 Metric Tons ..... | | | |
| China, P.R. | 1,863 | 1,595 | 1,370 | 1,860 | 1,373 | 1,347 |
| Europe | 1,842 | 1,738 | 1,867 | 2,045 | 2,086 | 2,092 |
| Pakistan | 1,230 | 1,122 | 1,104 | 1,144 | 1,114 | 1,052 |
| Egypt | 390 | 353 | 381 | 372 | 408 | 511 |
| India | 408 | 863 | 1,254 | 1,469 | 1,672 | 3,248 |
| Japan | 349 | 351 | 361 | 370 | 357 | 365 |
| Malaysia | 205 | 38 | 15 | 35 | 92 | 192 |
| Turkey | 201 | 201 | 171 | 240 | 174 | 188 |
| South Korea | 201 | 156 | 184 | 197 | 151 | 172 |
| Myanmar | 185 | 305 | 235 | 280 | 248 | 261 |
| USA | 160 | 102 | 125 | 135 | 116 | 131 |
| Bangladesh | 124 | 53 | 109 | 177 | 93 | 34 |
| Indonesia | 128 | 55 | 109 | 93 | 25 | 40 |
| South Africa | 160 | 128 | 147 | 160 | 140 | 163 |
| Saudi Arabia | 156 | 169 | 168 | 184 | 178 | 182 |
| Kenya | 196 | 177 | 171 | 208 | 187 | 175 |
| Ex USSR | 47 | 57 | 49 | 124 | 103 | 93 |
| Other Countries | 2,769 | 2,878 | 2,897 | 2,959 | 2,643 | 3,335 |
| TOTAL | 10,614 | 10,341 | 10,717 | 12,052 | 11,160 | 13,581 |

Source: Malaysian Palm Oil Board, 2000

America in the middle of the 15th century (Malaysian Palm Oil Promotion Council, 2000). Planting densities are from 136 to 160 trees per hectare. Palm fruit grow in large bunches that have 1,000 to 2,000 singular fruits per bunch. Each tree yields an average of twelve bunches per year and each bunch weighs 20 to 30 kg.

Palm oil trees are most productive from sea level to about 300 meters; in a region with a rainfall of 2,000 mm; with a mean maximum temperature of about $85^0$F to $90^0$F and a mean minimum temperature of about $72^0$F to $75^0$F; constant sunshine amounting to at least 5 hours per day in all months of the year (Hartley, 1977). Indonesia and Malaysia are the best regions for growing palm oil trees.

Palm oil tree's mature in 3 to 5 years after planting in the field, where average yields could be 3.2 tons palm oil and 0.46 ton palm kernel oil per hectare per year. Palm oil trees can be in economic production for 25 years (Khera, 1976).

Palm oil is extracted from the heavy mesocarp of palm fruit, which is 45 to 55 percent oil, and palm kernel oil is the oil that is extracted from the palm fruit's kernel (Figure 2.2.). Gunstone's (1978) diagram of the processes from palm oil bunches to be palm oil and palm kernel oil is shown in Figure 2.3. The fresh fruit bunches (FFB) from the field are carried by trucks to the sterilized cage by bunch loading ramps. In the sterilizer, fresh fruit bunches (FFB) are subjected to steam pressure to a) prevent the formation of free fatty acid, b) make machine stripping easier, c) condition the fruit pericarp for subsequent processing, d) precondition the nuts, e) deactivate hydrolytic enzymes that breakdown oil to free fatty acids, and f) release the fruits from the bunches (Palm Oil Research Institute of Malaysia, 2000). Fruit fresh bunches (FFB) are

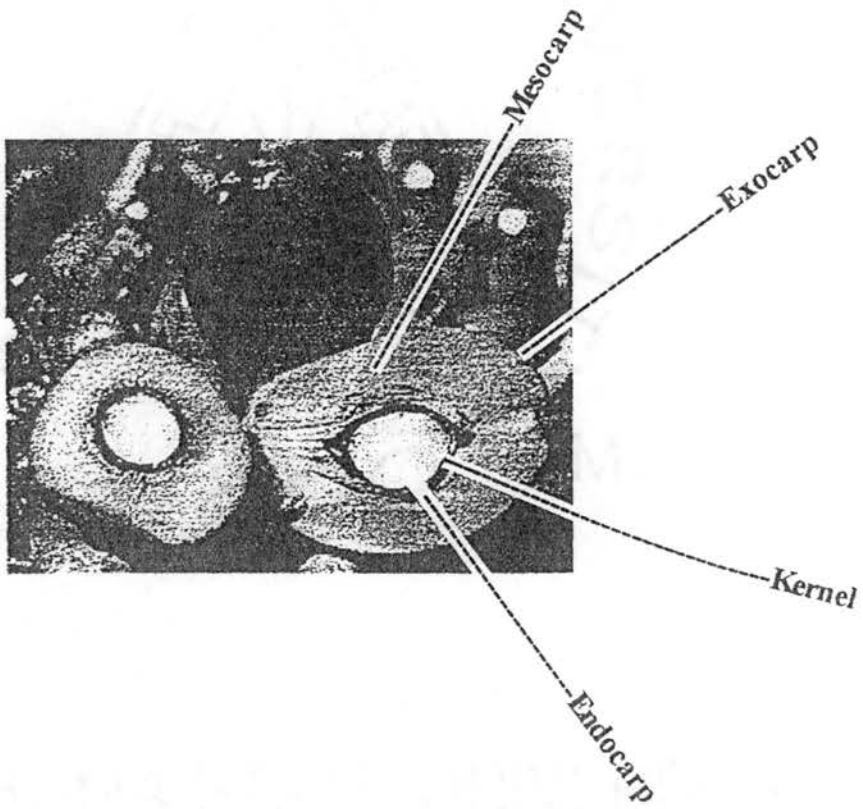


Figure 2.2. Cross-section of Palm Oil Fruit

Source: Moll, 1987;

Palm Oil Research Institute of Malaysia, 2000

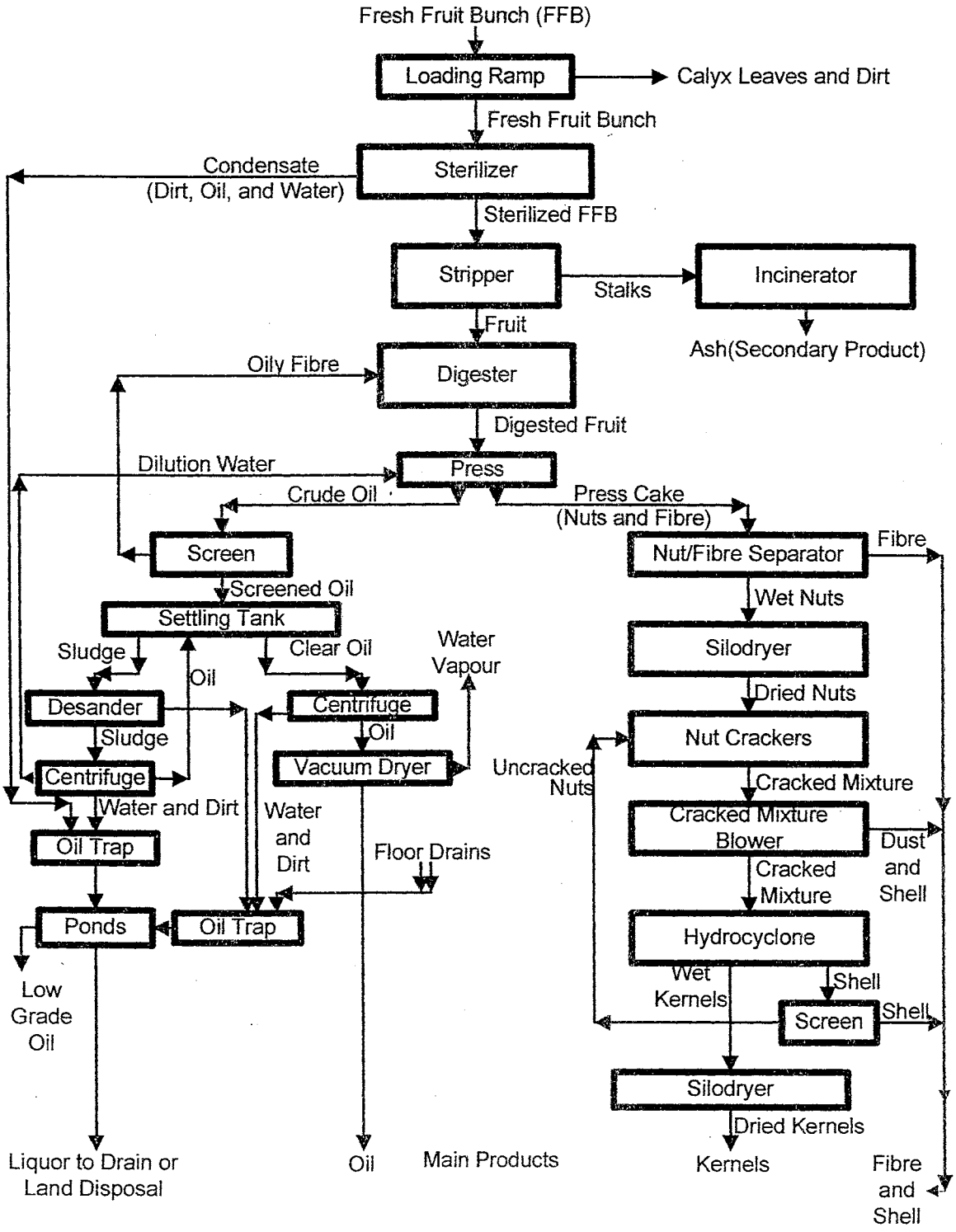


Figure 2.3. Material Flowchart for Palm Oil Processing

Source: Gunstone, 1987

sterilized by steam at $140^0$ C for 75-90 minutes. Next the sterilized fresh fruit bunches go to the stripper. The stripper separates the sterilized fruits from the leaves and stalks, and expels sterilized fruit and emptied bunch stalks. Next, the sterilized fruit goes to the digester. Inside the digester the fruit is reheated by steam and the pericarp is loosened. Next, the digested fruit goes to screw press machines where crude palm oil (CPO), nuts, and fiber are produced. Next crude palm oil is clarified and purified by screening, centrifuge, and vacuum dryer steps.

## 2.2. Palm Oil

Palm oil contains 53 percent saturated fatty acids and 47 percent unsaturated fatty acids (Table 2.10.). More palm oil than palm kernel oil is produced. A better quality palm oil and advanced technology in the manufacture of margarine and cooking fat have allowed an increased use of palm oil in edible products. The quality of palm oil is defined by its free fatty acid content, contamination, and bleach ability. Poor quality palm oil has high free fatty acid, is contaminated with water or other impurities, and/or has poor bleach ability.

Palm oil has two major products; crude palm oil (CPO) and processed palm oil (PPO). Refining and fractionation crude palm oil (CPO) yields processed palm oil (PPO). The four big products in the processed palm oil (PPO) category, as explained in Figure 2.4., are: 1) refined bleached deodorized palm oil (RBD Palm Oil); 2) refined bleached deodorized palm stearin (RBD Palm Stearin); 3) refined bleached deodorized palm olein (RBD Palm Olein); and 4) palm fatty acid distillate (PFAD). Other processed palm oil (PPO) products are listed in Appendix Table A-1.

Table 2.10. Composition of Palm Oil

| | Range in Share of Weight (%) |
|---|---|
| Saturated Fatty Acids | |
| Myristic | 1 – 6 |
| Palmitic | 32 – 47 |
| Stearic | 1 – 6 |
| Total | about 53 |
| Unsaturated Fatty Acids | |
| Linoleic | 5 – 7 |
| Oleic | 40 – 52 |
| Total | about 47 |
| Carotenes | 250 – 2600 ppm |

Source: Moll, 1987

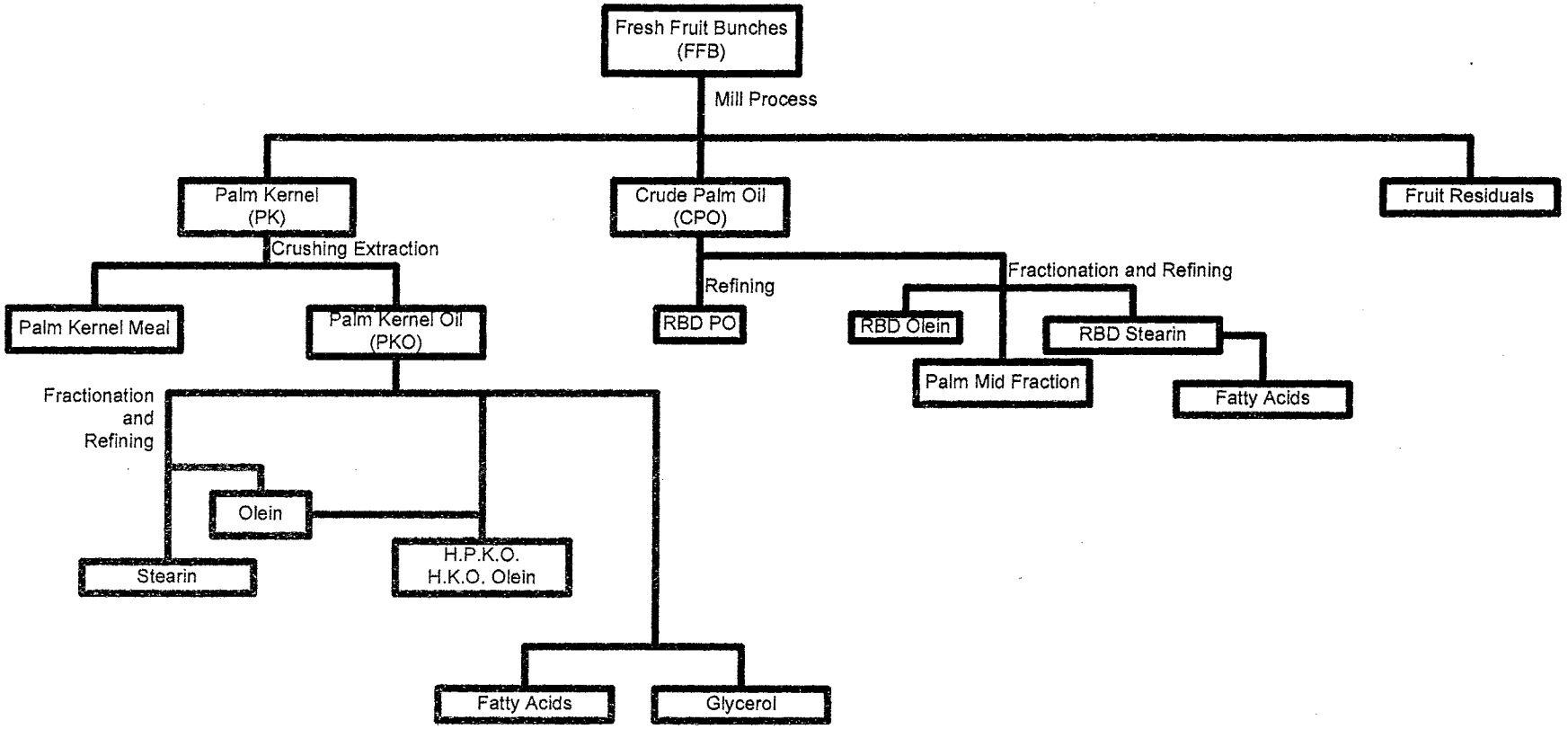


Figure 2.4. Chart Showing the Utilization of Palm Oil and Palm Kernel Oil

Source: Malaysian Palm Oil Promotion Council, 2000

## 2.3. Palm Kernel Oil

Palm kernel oil is distinguished from palm oil by its physical and chemical properties. Palm kernel oil contains 82 percent saturated fatty acids and 18 percent unsaturated fatty acids (Table 2.11.). The quality of palm kernel oil is established by free fatty acid content, color, and bleach ability. High quality palm kernel oil has low fatty acid content, a light yellow color, and it is easily bleached. Palm kernel oil has three categories of products. They are crude palm kernel oil (CPKO), processed palm kernel oil (PPKO), and palm kernel cake (PKC) (Figure 2.4.). The products that are put in to processed palm kernel oil (PPKO) category are stated in Appendix Table A-2.

## 2.4. Palm Oil and Palm Kernel Oil Industries

Production of palm oil and palm kernel oil in the world have been increasing every year. Causes for the dynamic growth in oil palm production include (Gunstone, 1987):

1) Policy of diversification.

   This policy was proposed to reduce Indonesia's dependence on petroleum as a source of foreign exchange earnings. Based on the information that petroleum export would decrease in the future, the alternative income from expanded palm oil and palm kernel oil industries would be desirable.

2) An improvement in palm oil tree varieties, cultivation, and processing technology.

   New palm varieties that yield products early and have higher yields per hectare have been developed.

Table 2.11. Composition of Palm Kernel Oil

| | Range in Share of Weight (%) |
|---|---|
| Saturated Fatty Acids | |
| Myristic | 14 – 17 |
| Palmitic | 6 – 9 |
| Stearic | 1 – 2.5 |
| Caprylic | 3 – 4 |
| Capric | 3 – 7 |
| Lauric | 46 – 52 |
| Total | 82 |
| Unsaturated Fatty Acids | |
| Linoleic | 13 – 19 |
| Oleic | 0.5 – 2 |
| Total | 18 |

Source: Moll, 1987

3) High profitability of palm oil growing relative to competing products.

   A West Malaysian study revealed that with palm oil prices of M$ 700 to M$ 850 per metric ton, freight on board (FOB) mill and 18.5 ton fresh fruit bunch yield, the profit per hectare was M$ 1,100 to M$ 1,695 contrasted with M$ 340 to M$ 860 for rubber at price M cents 200 to 265 per kilogram;

4) Ample availability land suitable for oil palm growing such as in Indonesia;

5) The firmness of the US dollar.

   The firmness of the US dollar could slow the world's consumption of other oilseeds from the US (soybean oil), and cause substitution of palm oil. Importing countries that are counting on imports of soybean oil and/or its products face home currency price increases when their currency depreciates relative to the US dollar. World soybean oil consumption would be expected to decrease which may cause world soybean production to decrease. Consequently, palm oil and palm kernel oil products may substitute for soybean oil.

## 2.5. Advantages and Disadvantages of Palm Oil Product

Advantages of palm oil include: 1) Natural coloring materials in palm oil can provide a colorant (for margarine and yellow fat); 2) A high solid glyceride content in palm oil gives consistency without hydrogenation; 3) Low linoleic and linoleic acid content in palm oil give good heat stability and provide excellent resistance to rancidity which in term means palm oil is an excellent deep frying medium; 4) A low level of triglycerides in palm oil minimizes the development of off-flavor from microbial action; 5) Palm oil has some industrial application for food uses (shortening, margarine,

frying fats, ice cream, cookies, dough fat, biscuits, non dairy creamer, instant noodles, icing, cake mixes, and crackers).

Other advantages of oil palm products include (Malaysian Palm Oil Promotion Council, 2000):

1) Palm oil is a natural source of the antioxidants vitamin E, tocopherol, and tocotrienols;
2) Palm oil is a very rich source of beta-carotene, which is an important source of vitamin A;
3) Palm oil contains a much higher proportion of palmitic acids. Higher palmitic acids are needed by the cake and baking industries for aeration of the fat/sugar mixture process; and
4) Palm oil is cholesterol free.

However, palm oil has some disadvantages too such as:

1) Palm oil has a high carotenoid level, which makes it difficult and costly to produce a low colored oil;
2) Palm oil has a wide plastic rage and gives relatively poor melting in the mouth; and
3) Palm oil's free fatty acid content increases rapidly in overripe or damaged fruit, which could cause problems for storage and increase refining costs.

## 2.6. Palm Oil and Palm Kernel Oil Industry of Indonesia

Larson (1996) reported that, in Indonesia, palm oil trees were cultivated and first utilized for soap production in mid-nineteenth century in Central Java. Palm oil plantations were producing edible oil by 1911. In 1938 the area of palm oil tree was

90,000 ha (Moll, 1987). From 1968 to 1988, palm oil production increased partially because of the government investment in Perseroan Terbatas Perkebunan Nusantara (PTP Nusantara) and the government's rural development projects for smallholders. PTP Nusantara is the government estate company. Smallholders expanded between 1970 and 1988 when 2 to 4 hectare areas were opened for smallholders and planted near PTP Nusantara. Smallholders produce, collect and deliver the fresh fruit bunch (FFB) to PTP Nusantara.

From 1988 to 1994, the most growth occurred in palm oil and palm kernel oil industries, through a cooperative Indonesian government and private sector arrangement called Pir-trans. In Pir-trans, the government is accountable for infrastructure and guaranteeing property rights. Private investors were given a credit for estate development and crop planting, and crushing facilities. Since 1994, the Indonesian government continued to encourage private, state-owned, and foreign companies to plant and expand palm oil and palm kernel oil industries in order to secure enough supply of palm oil and palm kernel oil products for the domestic market and to increase foreign exchange earnings from exports. In 1999 there were 693 palm oil plantations while in 1995 there were only 519 (Figure 2.5.).

In Indonesia, palm oil is a significant source of vegetable oil and cooking oil in the domestic market. Palm oil is the leading cooking oil domestically consumed, and palm oil is believed to be a crucial commodity for food security. Palm oil accounts for 80 percent of the domestic vegetable oil consumption while coconut oil represents 11 percent, palm kernel oil represents 7 percent, soybean oil is 0.7 percent, and peanut oil is 0.2 percent of the total market. Palm oil dominance of the domestic market could be

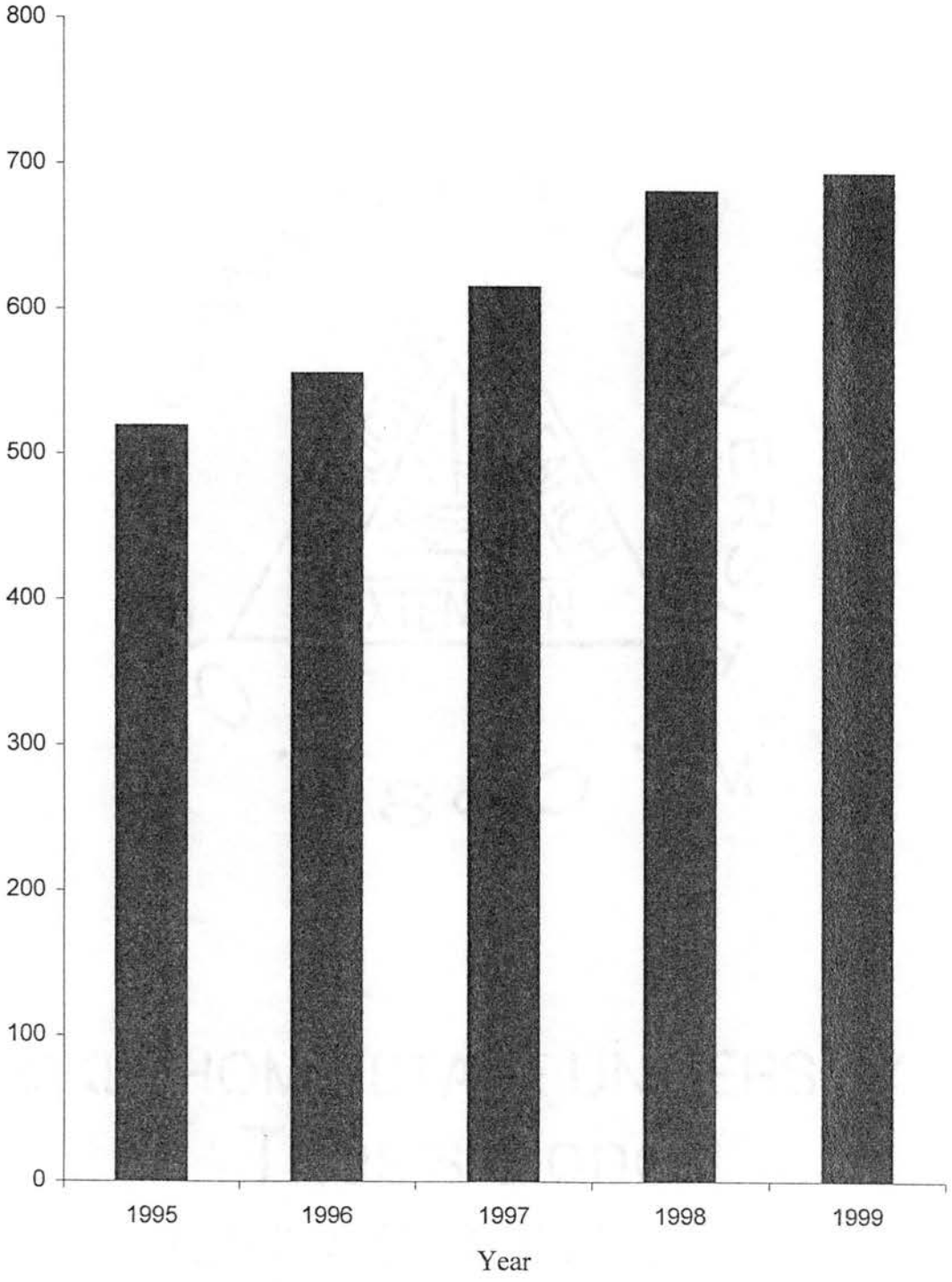


Figure 2.5. Total Number of Palm Oil Plantations, 1995-1999

Source: Badan Pusat Statistik, Database

related to the fact that the price of domestic palm oil is lower than the domestic price of coconut oil (Tables 2.12. and 2.13.).

Palm oil plantings and production have been increasing dramatically in Indonesia. Area planted in palm oil trees increased from 728,662 hectares in 1987 to 2,416,449 hectares in 1997, while palm oil production increased from 1,506,055 metric tons to 5,356,541 metric tons (Tables 2.14. and 2.15.). Almost two-thirds of palm production came from private companies in 1997. Private companies controlled 46.4 percent of the production area followed by government estates at 18.9 percent. Palm oil plantings can be found from West Indonesia to East Indonesia, from Sumatra to Irian Jaya. Sumatra is the largest palm oil plantation area harvested, with 87.8 percentage share of production in 1999, followed by Kalimantan, Sulawesi, Irian Jaya, and Java (Figure 2.6. and Table 2.16.). As the area and palm oil production increased, the number of large estate companies showed the notable increases from 289 large estate companies in 1991 to 352 in 1995 (Table 2.17.).

Palm oil and palm kernel oil generate foreign and domestic exchange revenue for Indonesia. In 1999 palm oil exports was 3,298,986.3 metric tons, 2.6 times more than export in 1995. The value of palm oil exports in 1999 was US $ 1,114,242.6 while in 1995 it was only US $ 747,413.8. Volume and value export of palm kernel oil were less compared to palm oil; 597,842.4 metric tons of palm kernel oil were exported with a value of US $ 347,974.6 in 1999, almost double the volume and value of exports in 1995 (Table 2.18.). Palm oil export prices were between US $ 275.9 to US $ 635.7 per metric ton (Figure 2.7.).

Table 2.12. Average Monthly Wholesale Prices for Crude Palm Oil (CPO) in the Jakarta Market, Indonesia, (Rupiah / 17 kg Containers) in 1996 and 1997

| | Year | |
|---|---|---|
| Month | 1996 | 1997 |
| | .....Rupiah / 17 Kg Containers..... | |
| January | 19,720 | 17,850 |
| February | 17,680 | 17,850 |
| March | 19,465 | 17,850 |
| April | 20,400 | 17,850 |
| May | 20,230 | 20,145 |
| June | 18,360 | 19,975 |
| July | 20,230 | 19,720 |
| August | 20,060 | 19,295 |
| September | 20,400 | 19,465 |
| October | 18,955 | 23,035 |
| November | 19,380 | 45,390 |
| December | 20,400 | 51,850 |

Source: Foreign Agricultural Service, USDA

Table 2.13. Average Monthly Wholesale Prices for Coconut Oil in the Jakarta Market, Indonesia, (Rupiah / 17 kg Containers) in 1996 and 1997

| | Year | |
|---|---|---|
| Month | 1996 | 1997 |
| | .....Rupiah / 17 Kg Containers..... | |
| January | 28,050 | 28,900 |
| February | 29,750 | 28,475 |
| March | 30,600 | 28,050 |
| April | 30,600 | 27,200 |
| May | 30,600 | 25,500 |
| June | 30,600 | 23,800 |
| July | 30,600 | 24,650 |
| August | 30,600 | 25,500 |
| September | 28,900 | 23,800 |
| October | 28,900 | 25,500 |
| November | 30,600 | 28,900 |
| December | 29,750 | 32,300 |

Source: Foreign Agricultural Service, USDA

Table 2.14. Indonesian Palm Oil Area in 1987-1997 (Hectares)

| Year | Government Estates | Smallholders | Private Companies | Total |
|---|---|---|---|---|
| | | .....Hectares..... | | |
| 1987 | 365,575 | 203,047 | 160,040 | 728,662 |
| 1988 | 373,409 | 196,279 | 293,171 | 862,859 |
| 1989 | 366,028 | 223,832 | 383,668 | 973,528 |
| 1990 | 372,246 | 291,338 | 463,093 | 1,126,677 |
| 1991 | 395,183 | 384,594 | 531,219 | 1,310,996 |
| 1992 | 389,761 | 439,468 | 638,241 | 1,467,470 |
| 1993 | 380,746 | 502,332 | 730,109 | 1,613,187 |
| 1994 | 386,309 | 572,544 | 845,296 | 1,804,149 |
| 1995 | 404,732 | 658,536 | 961,718 | 2,024,986 |
| 1996 | 441,158 | 757,316 | 1,028,363 | 2,226,837 |
| 1997 | 457,494 | 836,573 | 1,122,382 | 2,416,449 |

Source: Direktorat Jenderal Perkebunan, 1997

Table 2.15. Indonesian Palm Oil Production (Metric Tons) in 1987 – 1997

| Year | Smallholders | Government Estates | Private Companies | Total |
|---|---|---|---|---|
| | | .....Metric Tons..... | | |
| 1987 | 165,162 | 988,480 | 352,413 | 1,506,055 |
| 1988 | 156,148 | 1,102,692 | 454,495 | 1,713,335 |
| 1989 | 183,689 | 1,184,226 | 597,039 | 1,964,954 |
| 1990 | 376,950 | 1,247,156 | 788,506 | 2,412,612 |
| 1991 | 413,319 | 1,360,363 | 883,918 | 2,657,600 |
| 1992 | 699,605 | 1,489,745 | 1,076,900 | 3,266,250 |
| 1993 | 582,021 | 1,469,156 | 1,370,272 | 3,421,449 |
| 1994 | 839,334 | 1,571,501 | 1,597,227 | 4,008,062 |
| 1995 | 1,001,443 | 1,613,848 | 1,864,379 | 4,479,670 |
| 1996 | 1,097,230 | 1,751,484 | 2,111,045 | 4,959,759 |
| 1997 | 1,246,735 | 1,830,960 | 2,278,846 | 5,356,541 |

Source: Direktorat Jenderal Perkebunan, 1997


Figure 2.6. Map of Indonesia

Source: The World Factbook 2000

Table 2.16. Geographic Distribution of Indonesian Palm Oil Production from 1998 to 1999

| Island/ Province | Area Harvested (Ha) | Production (Metric Tons) | % Share of Production |
|---|---|---|---|
| 1998 | | | |
| Sumatra | 2,139,832 | 4,400,492 | 87.91 |
| Java | 21,502 | 28,938 | 0.58 |
| Kalimantan | 492,651 | 426,751 | 8.52 |
| Sulawesi | 101,220 | 106,462 | 2.13 |
| Irian Jaya | 24,677 | 43,260 | 0.86 |
| Total | 2,779,882 | 5,005,903 | 100.00 |
| 1999 | | | |
| Sumatra | 2,240,495 | 4,969,312 | 87.81 |
| Java | 21,502 | 32,054 | 0.57 |
| Kalimantan | 562,751 | 513,869 | 9.08 |
| Sulawesi | 101,251 | 97,685 | 1.73 |
| Irian Jaya | 31,080 | 46,090 | 0.81 |
| Total | 2,957,079 | 5,659,010 | 100.00 |

Source: Foreign Agricultural Service, USDA

Table 2.17. Number of Large Estates by Type of Crop in Indonesia, 1991-1995

| Crops | Year | | | | |
|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 |
| Perennial Crops | | | | | |
| Rubber | 490 | 490 | 485 | 480 | 480 |
| Coconut | 251 | 251 | 240 | 335 | 335 |
| Oil Palm | 289 | 289 | 330 | 352 | 352 |
| Coffee | 174 | 174 | 171 | 164 | 167 |
| Cocoa | 280 | 280 | 274 | 273 | 275 |
| Tea | 126 | 124 | 125 | 127 | 127 |
| Clove | 152 | 152 | 130 | 114 | 100 |
| Kapok | 30 | 30 | 27 | 26 | 25 |
| Cinchona | 8 | 8 | 7 | 7 | 7 |
| Annual Crops | | | | | |
| Sugar Cane | 73 | 70 | 69 | 70 | 72 |
| Tobacco | 23 | 23 | 23 | 22 | 22 |
| Rosella | 12 | 12 | 13 | 13 | 12 |

Source: Badan Pusat Statistik, 1997

# Table 2.18. Exports of Indonesian Palm Oil (PO) and Palm Kernel Oil (PKO) 1995-1999

| | Palm Oil | | Palm Kernel Oil | |
|---|---|---|---|---|
| Month, Year | Volume (Metric Tons) | Value (FOB US $ 000) | Volume (Metric Tons) | Value (FOB US $ 000) |
| 1995 | | | | |
| Jan, | 73,779.9 | 43,947.8 | 16,697.4 | 9,584.6 |
| Feb, | 73,708.4 | 46,857.1 | 21,371.8 | 14,667.6 |
| Mar, | 107,138.1 | 67,549.1 | 19,391.5 | 9,574.9 |
| Apr, | 81,018.5 | 51,223.9 | 33,389.8 | 20,215.5 |
| May, | 95,090.8 | 59,164.8 | 28,005.5 | 16,956.6 |
| Jun, | 88,369.6 | 51,291.1 | 32,510.3 | 17,654.0 |
| Jul, | 90,717.7 | 52,309.6 | 16,898.3 | 8,370.8 |
| Aug, | 65,014.4 | 36,810.5 | 21,229.2 | 14,018.4 |
| Sep, | 131,724.1 | 76,457.9 | 20,283.8 | 13,080.8 |
| Oct, | 167,682.2 | 96,169.4 | 36,156.1 | 24,710.0 |
| Nov, | 136,467.9 | 78,902.8 | 40,807.6 | 24,847.7 |
| Dec, | 154,312.6 | 86,729.8 | 24,657.6 | 13,586.4 |
| TOTAL | 1,265,024.2 | 747,413.8 | 311,398.9 | 187,267.3 |
| 1996 | | | | |
| Jan, | 822,264.9 | 44,273.9 | 15,235.1 | 9,707.9 |
| Feb, | 160,791.4 | 81,211.0 | 20,599.9 | 13,502.2 |
| Mar, | 158,701.8 | 80,539.2 | 27,147.3 | 17,483.4 |
| Apr, | 99,433.6 | 50,682.4 | 26,240.0 | 18,221.0 |
| May, | 139,040.3 | 68,775.2 | 34,007.0 | 23,543.8 |
| Jun, | 98,752.8 | 48,215.1 | 26,132.8 | 18,956.8 |
| Jul, | 141,041.1 | 71,611.4 | 26,698.7 | 18,574.3 |
| Aug, | 211,660.7 | 100,970.3 | 27,003.8 | 18,124.2 |
| Sep, | 154,806.4 | 68,925.4 | 47,730.7 | 33,347.8 |
| Oct, | 142,314.6 | 68,502.9 | 28,759.0 | 20,088.1 |
| Nov, | 154,945.0 | 75,191.3 | 31,328.1 | 22,132.7 |
| Dec, | 128,203.8 | 66,516.8 | 30,440.5 | 21,485.8 |
| TOTAL | 1,671,956.4 | 825,414.9 | 341,322.9 | 235,168.0 |
| 1997 | | | | |
| Jan, | 76,290.0 | 37,524.7 | 23,974.3 | 14,166.1 |
| Feb, | 177,298.2 | 94,457.8 | 48,558.8 | 32,861.9 |
| Mar, | 106,176.3 | 55,382.2 | 19,115.0 | 13,653.4 |
| Apr, | 186,595.0 | 98,308.4 | 33,772.0 | 22,458.5 |
| May, | 148,304.6 | 77,298.4 | 38,448.6 | 25,697.5 |
| Jun, | 224,223.5 | 110,363.7 | 41,420.0 | 27,599.7 |
| Jul, | 345,938.4 | 173,214.5 | 40,613.1 | 27,092.6 |
| Aug, | 331,852.1 | 160,648.1 | 53,755.0 | 27,159.2 |
| Sep, | 378,792.0 | 179,481.6 | 45,226.7 | 21,567.7 |
| Oct, | 314,718.5 | 142,753.3 | 43,834.3 | 20,675.6 |
| Nov, | 471,600.5 | 219,142.7 | 64,795.3 | 30,279.3 |
| Dec, | 205,810.1 | 97,524.7 | 49,465.4 | 31,043.8 |
| TOTAL | 2,967,599.2 | 1446,100.1 | 502,978.5 | 294,255.3 |

Table 2.18. Continued

| Month, Year | Palm Oil | | Palm Kernel Oil | |
|---|---|---|---|---|
| | Volume (Metric Tons) | Value (FOB US $ 000) | Volume (Metric Tons) | Value (FOB US $ 000) |
| 1998 | | | | |
| Jan, | 13,011.2 | 5,092.6 | 16,990.0 | 10,141.3 |
| Feb, | 25,056.5 | 11,238.9 | 34,583.5 | 19,391.0 |
| Mar, | 104,088.0 | 49,143.2 | 90,819.2 | 51,207.9 |
| Apr, | 38,845.4 | 17,873.6 | 32,183.0 | 17,711.0 |
| May, | 138,071.7 | 78,563.5 | 33,592.7 | 14,349.0 |
| Jun, | 91,951.1 | 45,563.2 | 23,389.0 | 13,669.6 |
| Jul, | 184,030.9 | 97,848.1 | 33,047.6 | 18,419.8 |
| Aug, | 123,713.6 | 53,432.8 | 6,789.5 | 4,177.9 |
| Sep, | 110,690.7 | 51,026.1 | 12,599.8 | 7,877.9 |
| Oct, | 143,883.2 | 75,963.8 | 4,240.0 | 2,519.9 |
| Nov, | 321,364.2 | 158,204.7 | 42,305.0 | 25,307.4 |
| Dec, | 184,571.7 | 101,327.3 | 16,469.0 | 10,574.2 |
| TOTAL | 1,479,278.2 | 745,277.8 | 347,008.3 | 195,346.9 |
| 1999 | | | | |
| Jan, | 84,456.4 | 42,950.1 | 12,664.0 | 7,192.0 |
| Feb, | 197,436.9 | 101,668.5 | 47,344.0 | 29,200.7 |
| Mar, | 217,044.9 | 97,244.4 | 42,675.4 | 25,763.8 |
| Apr, | 158,417.9 | 69,778.1 | 30,452.9 | 16,947.2 |
| May, | 190,305.3 | 79,066.0 | 77,402.1 | 44,902.1 |
| Jun, | 165,340.5 | 55,147.2 | 65,211.0 | 36,517.5 |
| Jul, | 332,410.6 | 106,148.2 | 54,485.5 | 31,388.4 |
| Aug, | 529,463.9 | 146,087.3 | 48,423.7 | 25,809.5 |
| Sep, | 532,869.4 | 151,322.0 | 72,067.7 | 40,887.2 |
| Oct, | 370,302.0 | 103,166.6 | 44,599.3 | 25,129.3 |
| Nov, | 246,154.2 | 71,220.6 | 47,632.6 | 28,264.4 |
| Dec, | 274,784.3 | 90,443.6 | 54,884.2 | 35,972.5 |
| TOTAL | 3,298,986.3 | 1,114,242.6 | 597,842.4 | 347,974.6 |

Source: Badan Pusat Statistik, Database

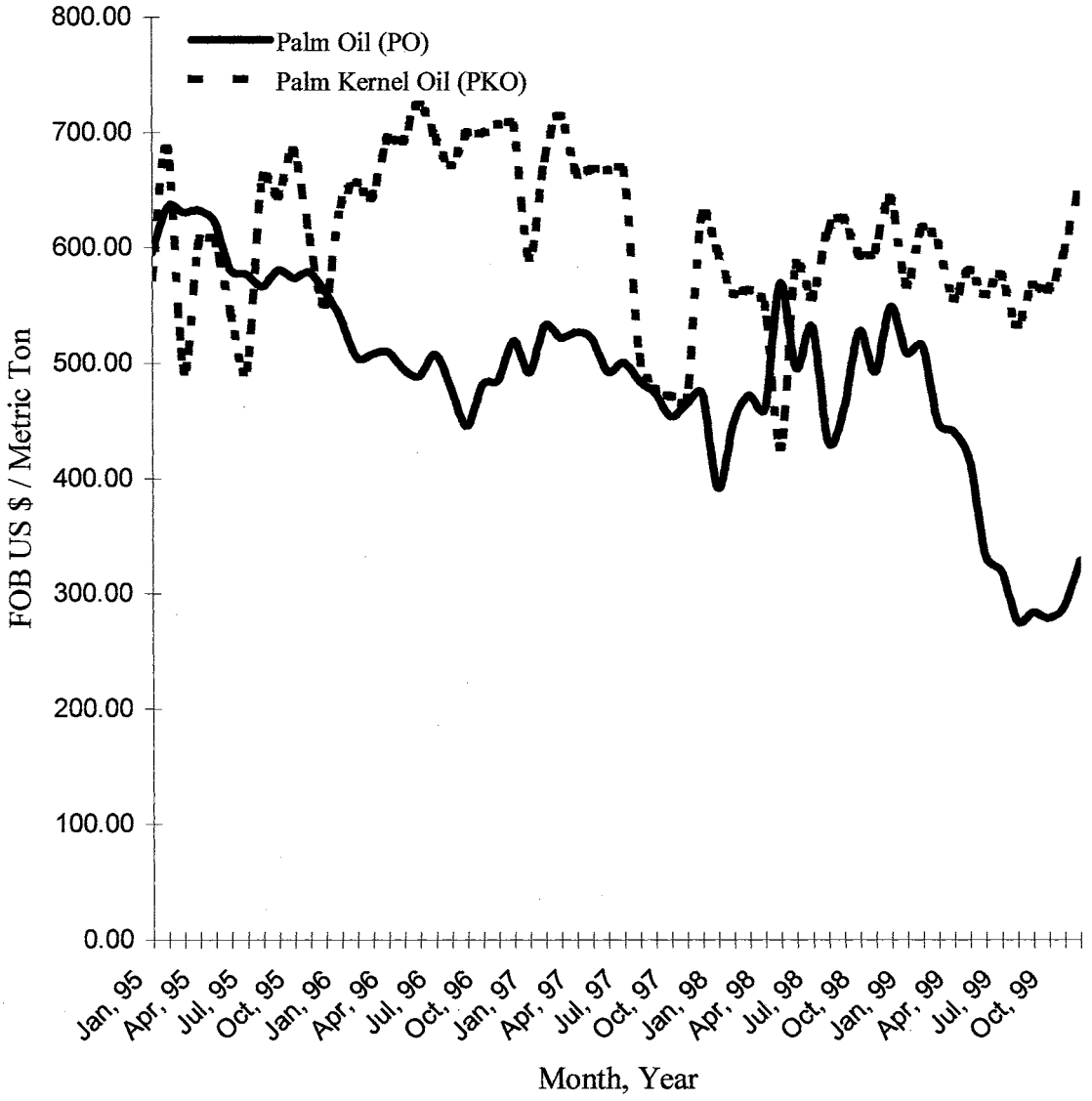


Figure 2.7. Indonesia's Export Prices of Palm Oil (PO) and Palm Kernel Oil (PKO), 1995-1999

Source: Badan Pusat Statistik, Database

## 2.7. Palm Oil and Palm Kernel Oil Industry of Malaysia

Malaysia began palm oil and palm kernel oil production in early 1917. In the 1950s the Malaysian government promoted an immense policy of agricultural diversification that included diversification from rubber and coffee plantations to palm oil plantations (Mahmud, 1982).

In Malaysia, palm oil trees are located in the Peninsular Malaysia, Sabah, and Sarawak (Figure 2.8. and Table 2.19.). Malaysian planted area of palm oil trees increased from 290,967 hectares in 1970 to 3,313,393 hectares in 1999 (Table 2.19.). In 1999, 58.6 percent of palm oil area was operated and managed by private estate companies; 25.6 percent by government organizations such as Federal Land Development Authority (FELDA), Federal Land Consolidation and Rehabilitation Authority (FELCRA), and Rubber Industry Smallholders Development Authority (RISDA); 8.7 percent by smallholders; and 7.1 percent by state schemes (Table 2.20.). FELDA (Federal Land Development Authority) is a government agency with the authority to open untouched land and forestry to be used for smallholder projects, FELDA was created in 1962. FELCRA is the Federal Land Consolidation and Rehabilitation Authority, with the duty to rehabilitate and expand the basic land, unused land, and the land developed earlier in a low cost state scheme. RISDA, the Rubber Industry Smallholders Development Authority, has a duty to replant rubber areas to be palm oil plantation (Moll, 1987).

Malaysian crude palm oil (CPO), palm kernel (PK), crude palm kernel oil (CPKO), and palm kernel cake (PKC) productions increased since 1979 (Figure 2.9.). In 1999, 10,553,918 metric tons of crude palm oil (CPO) was produced; 3,025,690 metric


Figure 2.8. Map of Malaysia

Source: The World Factbook 2000

Table 2.19. Malaysia's Palm Oil Planted Area (Hectares), 1970-1999

| Year | P. M'sia | Sabah | Sarawak | Total |
|---|---|---|---|---|
| | | .....Hectares..... | | |
| 1970 | 260,903 | 28,947 | 1,117 | 290,967 |
| 1980 | 906,590 | 93,967 | 22,749 | 1,023,306 |
| 1990 | 1,698,498 | 276,171 | 54,795 | 2,029,464 |
| 1991 | 1,744,615 | 289,054 | 60,359 | 2,094,028 |
| 1992 | 1,775,633 | 344,885 | 77,142 | 2,197,660 |
| 1993 | 1,831,776 | 387,122 | 87,027 | 2,305,925 |
| 1994 | 1,857,626 | 452,485 | 101,888 | 2,411,999 |
| 1995 | 1,903,171 | 518,133 | 118,783 | 2,540,087 |
| 1996 | 1,925,483 | 556,260 | 133,526 | 2,615,269 |
| 1997 | 1,956,573 | 715,736 | 147,007 | 2,819,316 |
| 1998 | 1,987,190 | 842,496 | 248,430 | 3,078,116 |
| 1999 | 2,051,595 | 941,322 | 320,476 | 3,313,393 |

Note: P.M'sia = Peninsular Malaysia

Source: Arabis, 2000

Malaysian Palm Oil Board, 2000

Table 2.20. Distribution of Palm Oil Planted Area in Malaysia 1997-1999

| Category | 1997 | | 1998 | | 1999 | |
|---|---|---|---|---|---|---|
| | Hectares | % | Hectares | % | Hectares | % |
| Private Estates | 1,498,481 | 53.15 | 1,751,371 | 56.90 | 1,942,452 | 58.62 |
| Government Schemes | 681,482 | 24.17 | 672,142 | 21.84 | 674,948 | 20.37 |
| FELDA | 117,735 | 4.18 | 130,651 | 4.24 | 132,354 | 4.00 |
| FELCRA | 37,063 | 1.32 | 37,862 | 1.23 | 41,561 | 1.25 |
| RISDA | | | | | | |
| State Schemes | 224,515 | 7.96 | 221,729 | 7.20 | 235,565 | 7.11 |
| Smallholders | 260,040 | 9.22 | 264,361 | 8.59 | 286,513 | 8.65 |
| TOTAL | 2,819,316 | 100.00 | 3,078,116 | 100.00 | 3,313,393 | 100.00 |

Source: Palm Oil Registration and Licensing Authority, 1998

Malaysian Palm Oil Board, 2000

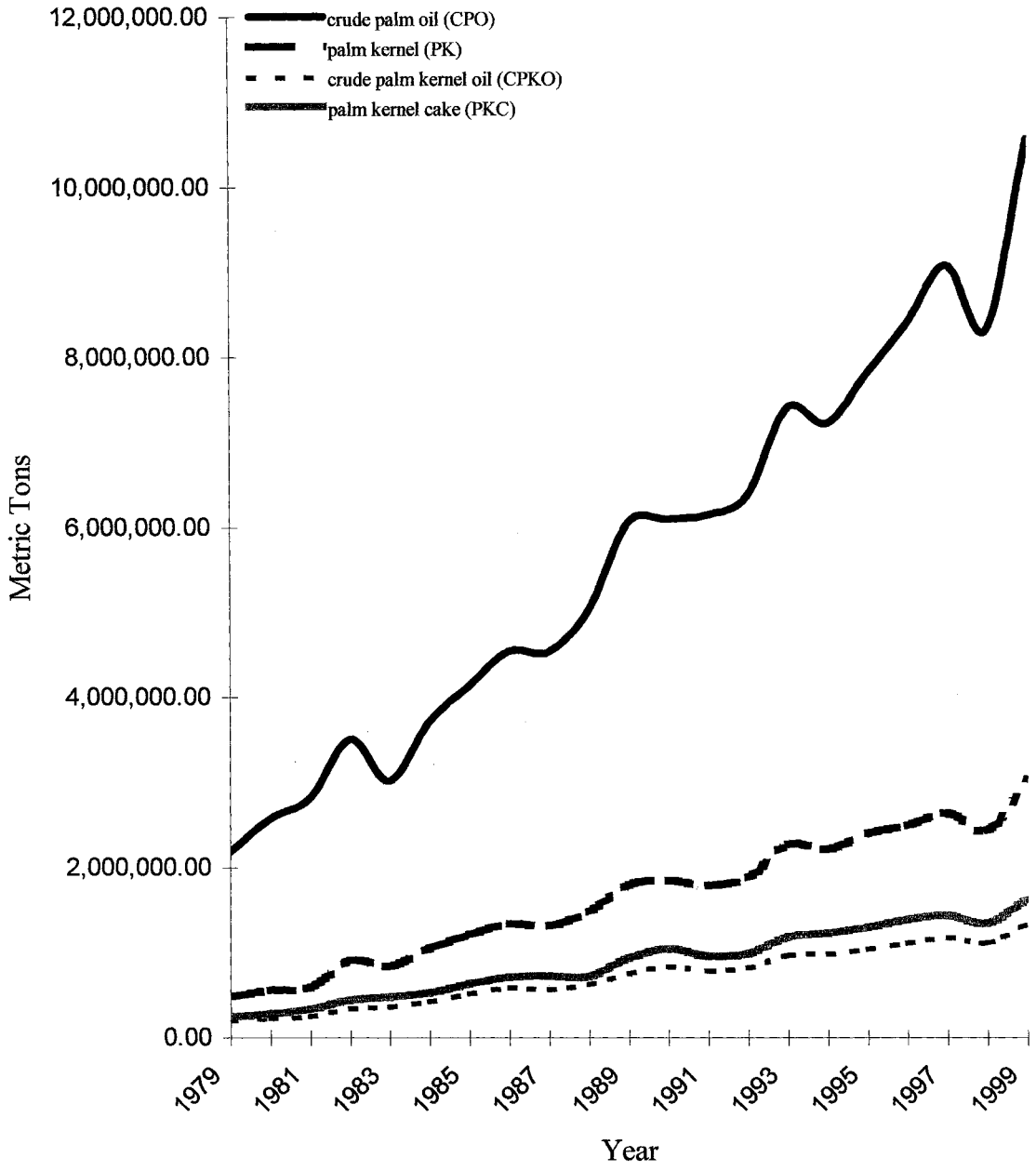


Figure 2.9. Annual Production of Crude Palm Oil (CPO), Palm Kernel (PK), Crude Palm Kernel Oil (CPKO), and Palm Kernel Cake (PKC) in Malaysia, 1979-1999

Source: Malaysian Palm Oil Board, 2000
Palm Oil Registration and Licensing Authority, 1999

tons were palm kernel (PK); 1,338,905 metric tons were crude palm kernel oil (CPKO); and 1,624,134 metric tons of palm kernel cake (PKC) were produced. Palm oil [crude palm oil (CPO) plus processed palm oil (PPO)] was the major export product followed by palm kernel cake (PKC) and palm kernel oil (PKO) [crude palm kernel oil (CPKO) plus processed palm kernel oil (PPKO)] (Figure 2.10.). Palm oil (PO) exports, especially processed palm oil (PPO), increased while crude palm oil (CPO) exports declined (Figure 2.11). Since 1991, palm kernel oil (PKO) exports has decreased (Figure 2.12.) while volume of exports of processed palm kernel oil (PPKO) was bigger than crude palm kernel oil (CPKO).

In 1999, Malaysia exported 261,123 metric tons of crude palm oil (CPO); 8,651,385 metric tons was processed palm oil (PPO); 84,170 metric tons was crude palm kernel oil (CPKO); 465,722 metric tons was processed palm kernel oil (PPKO); and 1,245,493 metric tons was palm kernel cake (PKC). Malaysian palm oil (PO), palm kernel oil (PKO), and palm kernel cake (PKC) products are exported, which palm oil (PO) is dominant.

The export value of Malaysian palm oil (PO) and palm kernel oil (PKO) products increased from US $ 10,973.80 in 1995 to US $ 16,142.90 in 1999 (Table 2.21.). Processed palm oil (PPO) made the biggest contribution to foreign exchange earning from palm oil industry in Malaysia. West Asian Countries such as India and Pakistan were the major importers of Malaysian palm oil (PO) while European countries such as Netherlands and the USA were the most important importers of Malaysian palm kernel oil (PKO), while the Netherlands and Germany were the biggest market for Malaysian palm kernel cake (PKC) in 1998-1999 (Appendix Tables A-3.; A-4.; and A-5).

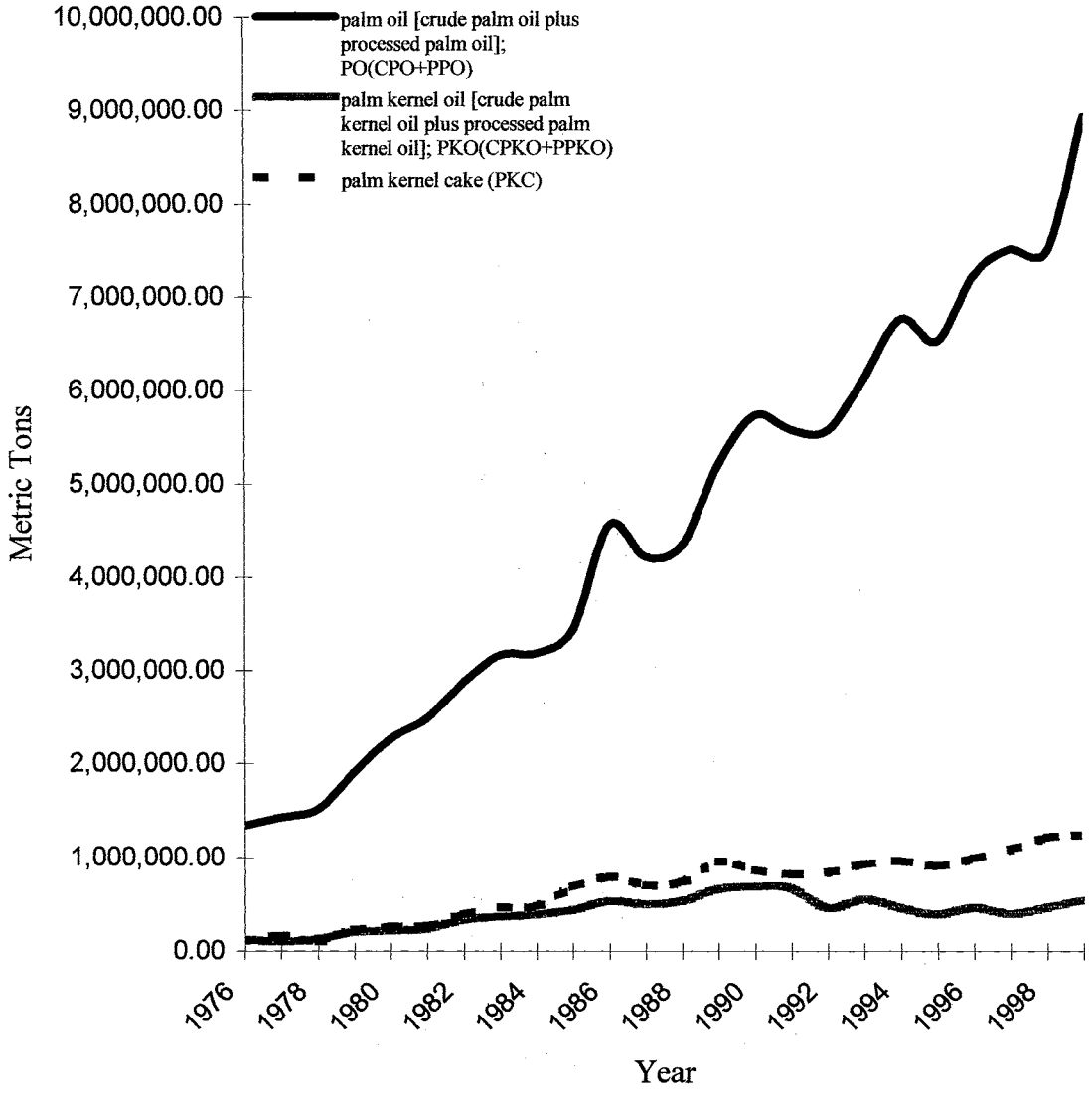


Figure 2.10. Annual Exports of Palm Oil (PO), Palm Kernel Oil (PKO), and Palm Kernel Cake (PKC) Products in Malaysia, 1976-1999

Source: Palm Oil Registration and Licensing Authority, 1999
Malaysian Palm Oil Board, 2000

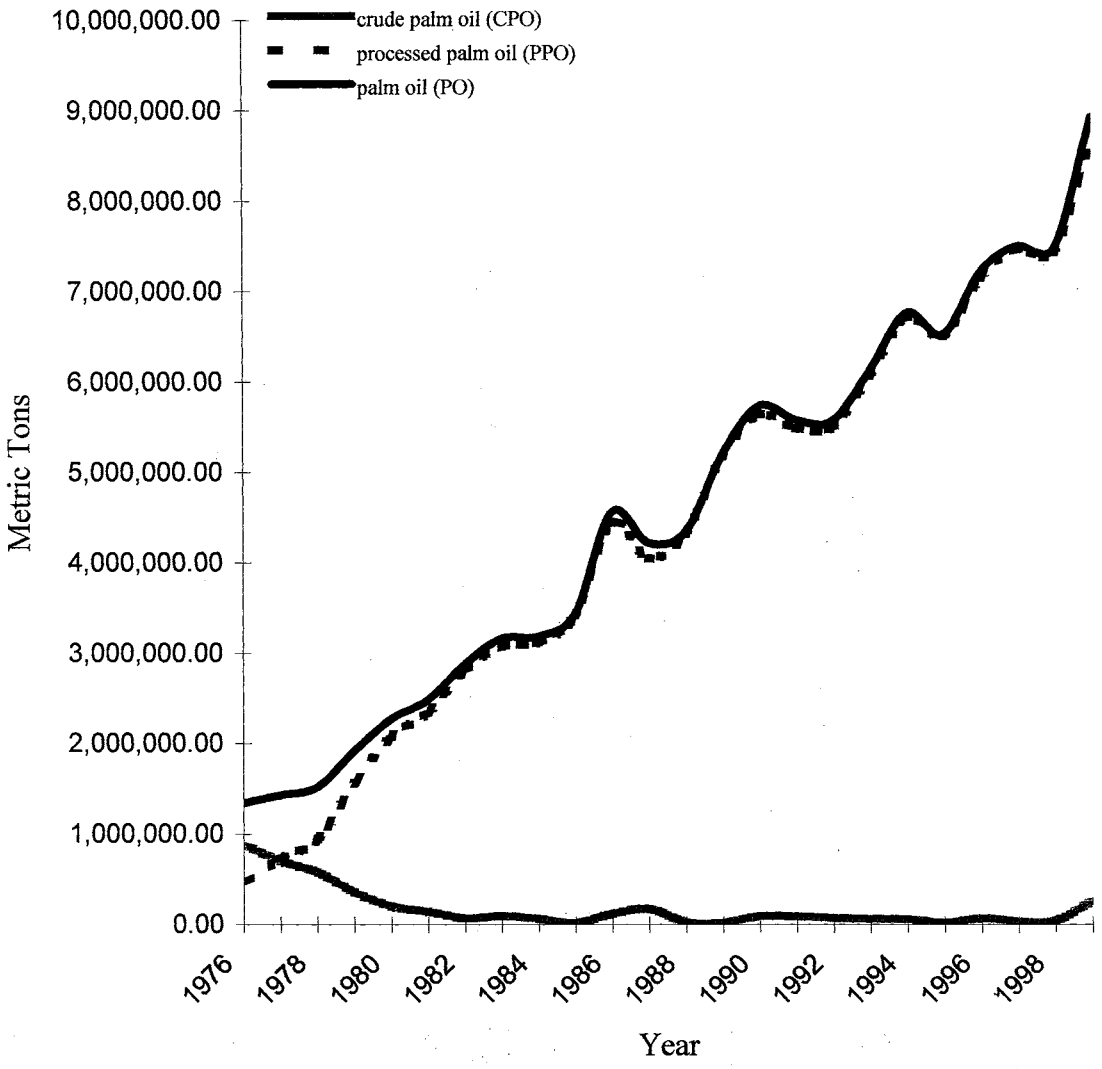


Figure 2.11. Annual Export of Palm Oil (PO) Including Crude Palm Oil (CPO) and Processed Palm Oil (PPO) in Malaysia, 1976-1999

Source: Palm Oil Registration and Licensing Authority, 1999
Malaysian Palm Oil Board, 2000

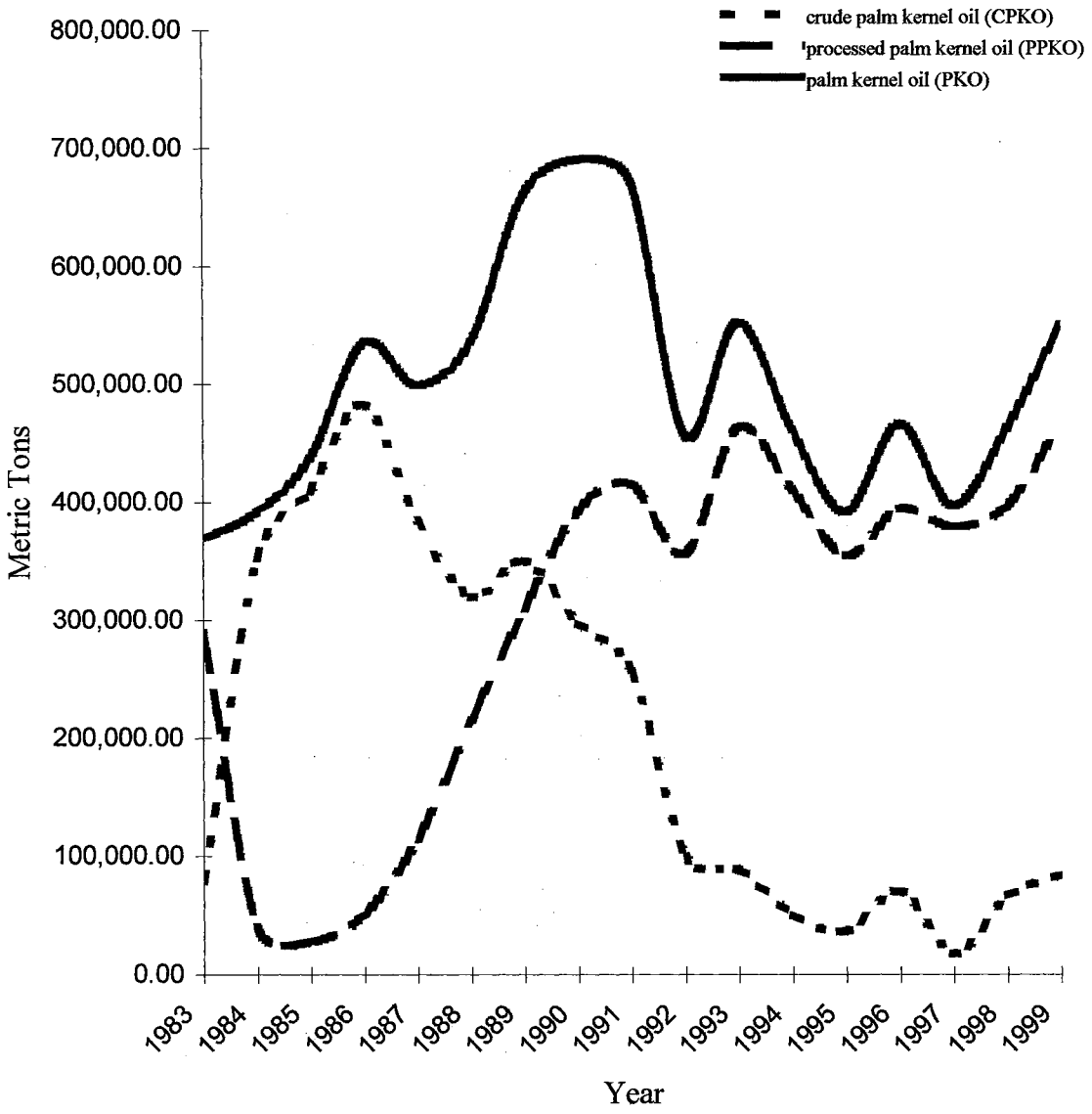


Figure 2.12. Annual Export of Palm Kernel Oil (PKO) Including Crude Palm Kernel Oil (CPKO) and Processed Palm Kernel Oil (PPKO) in Malaysia, 1983-1999

Source: Palm Oil Registration and Licensing Authority, 1999
Malaysian Palm Oil Board, 2000

Table 2.21. Export Value of Malaysian Palm Oil Products, 1995-1999

| Product | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|
| | | | .....RM Million..... | | |
| Palm Oil (PO) | 10,073.7 | 9,232.1 | 10,581.0 | 17,650.7 | 14,418.1 |
| Palm Kernel Oil (PKO) | 710.7 | 862.5 | 759.6 | 1,269.8 | 1,494.1 |
| Palm Kernel Cake (PKC) | 189.4 | 255.1 | 207.2 | 218.2 | 230.7 |
| TOTAL | 10,973.8 | 10,349.7 | 11,547.8 | 19,138.7 | 16,142.9 |

Source: Palm Oil Registration and Licensing Authority, 1995
Palm Oil Registration and Licensing Authority, 1996
Palm Oil Registration and Licensing Authority, 1997
Malaysian Palm Oil Board, 2000

Annual average prices of palm oil and palm kernel oil products in Malaysia are informed in Table 2.22. In 1995-1999, crude palm oil (CPO) local prices were between RM 1,191.50 to RM 2,377.50 per metric ton; palm kernel (PK) prices were RM 323.00 to RM 1,115.50 per metric ton; and crude palm kernel oil (CPKO) had range price between RM 578.00 to RM 2,525.50 per metric ton.

Table 2.22. Annual Average Prices of Palm Oil Products in Malaysia, 1980-1999

| Year | Crude Palm Oil (CPO) (LocalDelivered) | Palm Kernel (PK) (Ex-Mill) | Crude Palm Kernel Oil (CPKO) (Local Delivered) |
|---|---|---|---|
| | | ..... US Dollar / Metric Ton..... | |
| 1981 | 429.72 | 238.04 | 502.38 |
| 1982 | 357.56 | 183.96 | 383.87 |
| 1983 | 423.74 | 289.90 | 610.81 |
| 1984 | 580.10 | 378.35 | 869.02 |
| 1985 | 433.19 | 221.26 | 478.35 |
| 1986 | 222.37 | 124.16 | 222.18 |
| 1987 | 310.25 | 185.63 | 364.64 |
| 1988 | 379.35 | 228.94 | 446.27 |
| 1989 | 304.56 | 203.78 | 401.45 |
| 1990 | 259.64 | 146.22 | 282.80 |
| 1991 | 307.14 | 187.63 | 357.81 |
| 1992 | 351.62 | 252.25 | 508.15 |
| 1993 | 329.51 | 171.23 | 354.87 |
| 1994 | 501.80 | 280.12 | 599.34 |
| 1995 | 579.61 | 290.10 | 623.11 |
| 1996 | 471.34 | 319.04 | 667.15 |
| 1997 | 349.25 | 194.56 | 442.61 |
| 1998 | 625.66 | 293.55 | 664.61 |
| 1999 | 381.45 | 281.45 | 641.84 |

Source: Malaysian Palm Oil Board, 2000

# CHAPTER III

# POLITICAL AND ECONOMIC POLICIES

## 3.1. Chronology of the 1997-1998 Asian Financial Crisis in Indonesia

Before 1997, the Indonesian economy had a real gross domestic product (GDP) growth rate of over 7 percent per year. Gross domestic product (GDP) per capita was over US $ 1,000.00, inflation was 5 percent, and the current account deficit from its gross domestic product (GDP) was about 4 percent (Garran, 1998; Country Commercial Guides).

During and after the crisis of 1997-1998, the Indonesian government approximated that its real GDP shrank by 19 percent, while economic growth was 5 percent in 1997 and –13 percent in 1998 (Appendix Table A-6), inflation was 5.25 percent in 1997 and 56.25 percent in 1998 (Appendix Tables A-7 and A-8). Gross domestic product (GDP) per capita dropped drastically to US $ 450.00, and the exchange rate moved from Rp 2,383.00 per US dollar in December 1996 to Rp 7,100.00 per US dollar in December 1999 (Appendix Table A-9). The crisis caused higher unemployment. Unemployment rose from 4,197,306 people in 1997 to 5,062,783 people in 1998 (Appendix Table A-10).

The chronology of the crisis of 1997-1998 in Indonesia is stated below:

January 1997 through July 1997, Indonesian exchange rate in Rupiah per US dollar gradually increased from 2,396.00 to 2,599.00. Indonesia's foreign debt was US $ 109.3 billion in March 1997.

July 7, 1997 : The average exchange rate was Rp 2,599.00 per US dollar. Although the Rupiah started on a speculative confrontation after Thai's Baht had been floated, it began to deteriorate. Thailand went to a floating exchange rate scheme on July 2, 1997. The Indonesian government responded to the Thailand crisis by widening its exchange rate intervention band from 8 percent to 12 percent (Jackson, 1999; Saxena). Intervention band is the range points of upper and lower intervention which the country's bank central should intervene its market exchange rate.

August 14, 1997 : The average exchange rate was Rp 3,035.00 per US dollar. The Bank Indonesia (central bank of Indonesia) stated that it abandoned its intervention band allowing Rupiah to float freely against US dollar. Thus the Rupiah value was no longer restrained by the government (Jackson, 1999). Bank Indonesia had abolished its managed exchange rate system. A high interest rate (70 %) was set by Bank Indonesia. The Rupiah instantaneously depreciated by 6 percent after the announcement of the 70 % interest rate policy change.

September 16, 1997: The average exchange rate was Rp 3,275.00 per US dollar. The Indonesian government made an effort to reduce budget outlays by announcing that some US $ 13 billion in infrastructure projects would be either called off, delayed, or reconsidered (Jackson, 1999). A Rp. 38.92 trillion project would be postponed, and other Rp. 62.6 trillion project would be reviewed. The other major projects that were postponed were 14 power generators, 2 oil refineries, and 29 toll roads. In addition, nine power plants and 19 toll roads were being reviewed. Major projects that were canceled included bridges between Java and Madura island, Java and Sumatra island, and Sumatra and Malaysia.

October 1, 1997 : The average exchange rate was Rupiah 3,670.00 per US dollar. Again to handle the crisis, the Indonesian government tried harder to delay the projects. Hence, additional seventy five projects (their worth was US $ 62 billion) were postponed. The Indonesian government asked for help from International Monetary Fund (IMF) (Jackson, 1999). The help from International Monetary Fund (IMF) was needed to strengthen the Indonesian financial sector.

October 8, 1997 : The International Monetary Fund (IMF) announced support and help for Indonesia after the Indonesian government requested aid.

October 22, 1997 : US $ 40 billion would be given to Indonesia by the International Monetary Fund (IMF), some of Indonesia's neighbors, the

World Bank, and the Asian Development Bank.

October 31, 1997 : The Indonesian government signed its first Letter of Intent to the International Monetary Fund (IMF). The letter called for a three-year economic recovery program supported by loans from the International Monetary Fund) (IMF), the World Bank, the Asian Development Bank, and bilateral donors (Country Commercial Guides).

November 5, 1997 : The average exchange rate was Rp 3,648.00 per US dollar. The International Monetary Fund (IMF) endorsed a US $ 10 billion as a component of an international package. As a result US $ 3 billion was released for disbursement with a note that the International Monetary Fund (IMF) would require the Indonesian government to: 1) adopt fiscal measures to maintain a surplus; 2) tighten the monetary policy; 3) close down the unviable banks; 4) liberalize foreign trade and investment; 5) dismantle domestic monopolies, break up the government monopolies, and reduce the interest of ruling families and its cronies (Saxena); 6) allow private sector participation in infrastructure; and 7) increase the transparency of public sector activities to enhance the quality of governance. Following the International Monetary Fund (IMF) packages, 16 banks were shut down by the Indonesian government (Woo, Sachs, and Schwab, 2000). Other banks experienced rush and panic.

November 8, 1997 : The projects that were cancelled, postponed, and reviewed on September 16, 1997 were reinstalled.

December 8, 1997 : The average exchange rate was Rp 4,650.00 per US dollar. It was announced that President Soeharto had health problems which led to the cancellation of two overseas meetings including a meeting of the association of Southeast Asian Nations (ASEAN) summit meeting in Kuala Lumpur Malaysia. Four directors from the central bank of Indonesia were dismissed. Monetary instability in Indonesia increased. Four state banks (Bank Dagang Negara, Bank Bumi Daya, Bank Ekspor Import Indonesia, and Bapindo) were merged by the government in order to cope with the crisis.

December 24, 1997: The Indonesian debt was rated as "Ba1" (junk rating) by Moody's Investor Service. As a result, international banks were very reluctant to give business loans in Indonesia.

January 4, 1998 : The minimum wage was deliberated to be increased by the government.

January 6, 1998 : The average exchange rate was Rp 10,375.00 per US dollar. The Indonesian government publicized Rp. 133.5 trillion as the 1998-1999 state budget. The businessman and investors in Indonesia refused the budget after the announcement, they disputed that 1998-1999 budget was unrealistic and over optimistic. The budget was based on an assumed exchange rate of Rp 4,000 per US dollar; a real growth rate of 4 percent; inflation rate of

9 percent; and oil price of US $ 17 per barrel. The Rupiah dropped further from Rp 7,000 to Rp 10,000 per US dollar. People hurried to traditional markets, stores, and supermarkets to buy and stock food in the expectation of higher prices and vanishing commodities. The Rupiah got "junk bond status" grade from rating agency Standard & Poor. Again, the Indonesian government applied that the projects on the statement on September 16, 1997 to be reviewed, postponed, and canceled.

January 15, 1998 : Indonesia's agreement with International Monetary Fund (IMF) was revised for the first time. Accordingly, President Soeharto signed a new reform package called Memorandum of Economic and Financial Policies. The memorandum specified:

1) Financial sector restructuring. Including closing unviable institutions, merging state banks, and establishing a timetable for dealing with remaining weak institutions;
2) Structural reforms to enhance economic efficiency and transparency. Which included liberalization of foreign trade and investment. Dismantling of domestic monopolies such as sugar, wheat, and cloves. They also wanted to expand the privatization program. Eliminating the cement, paper, and plywood cartels. Abolishing all services that government gives to the national car project,

and airplane project Industri Pesawat Terbang Nasional (IPTN). The national car project was given to PT Timor Putra Nasional (PT TPN) company that was operated by Mr. Hutomo Mandala Putra (he is son of Mr. Soeharto the president of Indonesia). For the project, PT Timor Putra Nasional imported cars in completely built up from KIA Motor Corp. South Korea without tax of luxury selling and import tax. PT Industri Pesawat Terbang Nasional (PT IPTN) was established in 1976 with helped from Mr. B.J. Habibie as the president director. PT Industri Pesawat Terbang Nasional (PT IPTN) was the industry that needed huge input capital, at least US $ 650 million from Indonesia budget was given without giving back the income from its business;

3) Stabilizing the Rupiah via the retention of a tight monetary policy and a flexible exchange rate policy;
4) Implementing fiscal policy to about one percent of gross domestic product (GDP) in 1997/98, and two percent in 1998/99 to yield a public sector surplus of one percent of GDP in both periods and to facilitate external adjustment and provide resources to pay for financial restructuring. The fiscal policies included cutting low priority expenditures, including postponing or rescheduling major

state enterprise infrastructure projects, removing government subsidies, adjusting administered prices including the prices of electricity and petroleum products.

To attempt with the memorandum, the Indonesian government:

a) reduced the 1998/99 budget;

b) cancelled of 12 infrastructure projects and the revoking of discontinuation of privileges for the PT Industri Pesawat Terbang Nusantara's airplane projects (PT IPTN) and the National Car project;

c) further restructuring in the bank and corporate sectors. The establishment of the Indonesian Bank Restructuring Agency (IBRA) to manage reorganization process. Provided a government guarantee on bank deposits and credits;

d) limited the monopoly of the national marketing board (BULOG) to rice. Deregulated domestic trade in agriculture produce. Eliminated restrictive market of good;

e) took policy to alleviate the suffering caused by drought before 1997. Ensured that adequate food supplies are available at reasonable prices (IMF);

f) dismantled the monopoly on cloves, and fuel (Garran, 1998).

January 19, 1998 : The Rupiah was 12,000 against US dollar. There was news that corporations should pay dollar debts in Rupiah. Consequently, the Indonesian government announced that fuel subsidies would

be cut.

January 21, 1998 : President Soeharto verified that he would attempt to be the next president.

January 22, 1998 The exchange rate was Rp. 17,000 per US dollar. The Rupiah continued to weaken due to:

1) the apparent lack of a solution to Indonesia's huge private sector short term dollar denominated debts;

2) questions about Indonesia's commitment to the reform package by International Monetary Fund (IMF);

3) the International Money Fund (IMF) aid package seemed could not solve Indonesian crisis since the International Monetary Fund (IMF) had given the aided US $ 10 billion two months ago;

4) and the succession issue that Indonesia's research and technology minister Mr. B.J. Habibie being preferred as a candidate for the vice president (IMF). The foreign balance due by private and government business now can be paid by using Rupiah.

January 24, 1998 : The Indonesian government corrected the 1998-1999 state budget, from Rp. 133.5 trillion to 147.2 trillion using International Monetary Fund (IMF) assumptions of:

1) zero economic growth for upcoming fiscal year;

2) an annual inflation rate of 20 percent;

3) an exchange rate was Rp. 5,000 per US dollar (IMF).

January 27, 1998 : The Indonesian government announced new reforms in banking that would guarantee commercial bank obligations, and allow overseas investment in local banks. The debt servicing that was given by the Indonesia government for private business was momentarily stopped.

February 6, 1998 : The Currency Board System (CBS) was planned to be applied by the Indonesia government, which would peg the Rupiah to US dollar.

February 14, 1998 : There was a riot in West Java province because of a hike in the price of commodities such as rice and palm oil.

February 17, 1998 : The average exchange rate was Rp 8,750.00 per US dollar. Mr. B. J. Habibie was confirmed as vice president of Indonesia. The Governor of the Bank Indonesia was fired by president Soeharto since he was opposing the Currency Board System (CBS) that was to be approved by the government. The International Monetary Fund (IMF) and the World Bank gave statements that they refused to apply the Currency Board System (CBS) in Indonesia since Indonesian banks had the banking problems and Indonesia did not have enough backup of gross foreign assets and government incomes. With the banking problems and not enough government income, the implementation of the Currency Board System (CBS) could cause:

1) monetary policy does not work since the Currency Board System (CBS) does not allow it;

2) to increase the interest rate and capital out from the country when government income backup is not enough.

The Indonesian government and the International Monetary Fund (IMF) would reach a deal of US $ 23 billion aid package with the economic reform in exchange. As a result, 54 ineffective banks (4 state owned banks, 11 regional development banks, and 39 private banks) were turned over to the Indonesian Bank Restructuring Agency (IBRA) for restructuring/closure (Goldstein, 1998).

February 22, 1998 : The Indonesian government eliminated the polemical the Currency Board System (CBS) since it can make situation worse.

March 1, 1998 : The general assembly for the president of Indonesia 1998-2003 has begun from March 1, 1998 to March 11, 1998. In Indonesia, the people do not vote directly for their president but from 500 parliamentarians (Indonesia's highest legislative body) that they chose through the election then the parliamentarians choose the president. The Indonesia's highest legislative body not only chooses the president but the vice president too. There were two parties (Partai Persatuan Pembanguan or the United Development Party, and Partai Demokrasi Indonesia or the Indonesian Democracy Party) and one functional group (Golongan Karya or

GOLKAR) that were running for parliamentarian seats. The average exchange rate was Rupiah 8,325.00 per US dollar. The Indonesian government attempted to implement the Currency Board System (CBS), which was an unconfirmed in the agreement by the International Monetary Fund (IMF). Later, the International Monetary Fund (IMF), the Asian Development Bank, and the World Bank postponed the second US $ 3 billion aid to Indonesia when the Indonesian government was ready to use the Currency Board System (CBS). The International Monetary Fund (IMF) found that the Indonesian government did not put into action the points of economic reform from the Letter of Intent that was endorsed in January 1998. President Soeharto started his 4th decade as the president, and Mr. B.J. Habibie as the vice president. The seventh development cabinet was sworn in by president Soeharto. Finally, the Indonesian government announced that they would not put the Currency Board System (CBS) into operation.

March 14, 1998 : The IMF and world leaders announced that they were dissatisfied that president Soeharto chose his eldest daughter (Mrs. Siti Hardiyanti Rukmana) and his golfing partner (Mr. Bob Hasan) as part of his new 36 member cabinet.

April 10, 1998 : The average exchange rate was Rp 7,970.00 per US dollar.

Indonesia's agreement with the International Monetary Fund (IMF) was revised for the second time. The International Monetary Fund requested that the Indonesian government:

1) eliminates the paper cartel;

2) eliminates the plywood cartel;

3) eliminates the clove monopoly;

4) reforms its wood sector by introduction of a resource rent tax on forestry products, and reduction of export taxes on logs and timber, including dismantlement of joint marketing boards of wood products, and reforms of forestry concession ownership rules;

5) embarks upon a program to privatize state enterprises;

6) eliminates many distortions in the agricultural and food marketing sectors including a dramatic downsizing of the National Logistic Agency (BULOG);

7) prepares procedures for bank mergers;

8) enacts a government regulation in lieu of amendment of bankruptcy law;

9) establishes a special commercial court;

10) addresses the private-debt settlement issues;

11) establishes social safety net;

12) does gradual phase out of subsidies for essential commodities;

13) submits a draft law on competition policy.

As feedback to the International Monetary Fund (IMF) reform package, the Indonesian government released the first supplementary memorandum called the Supplementary Memorandum of Economic and Financial Policies. Some statements of the first supplement were:

1) a strong monetary policy to ensure stabilization of the Rupiah;
2) accelerated bank restructuring and the elimination of existing foreign ownership restrictions on bank, and the issuance of a new bankruptcy law;
3) a comprehensive agenda of structural reforms to increase competition and efficiency in the economy; further privatization of six major state enterprise and the identification of seven new enterprise for privatization in 1998/99;
4) strengthening the social safety net through the support for small and medium sized enterprises and through public works program of International Monetary Fund. Seven banks were closed by the government.

May 4, 1998 : The average exchange rate was Rp 10,525.00 per US dollar. The Indonesian government increased fuel prices up by 71 percent followed by demonstration and riot in Jakarta.

May 9, 1998 : President Soeharto left for Egypt to attend G-15 meeting.

May 12, 1998 : The Indonesian army shot six students of Universitas Trisakti

near their campus Universitas Trisakti, Grogol, Jakarta. Other 16 students were injured. It happened when the students of Universitas Trisakti had long march to the building of people's consultative assembly Jakarta demanded political and economic reforms. Shops and supermarkets in some areas in Indonesia were robbed and burned by people (Garran, 1998) targeting the Chinese business in Indonesia. President Soeharto was requested by the Indonesian Muslim leaders and the oppositions to step down.

May 14, 1998 : Riot dispersed in capital city, Jakarta, with an estimated 1,180 deaths and numerous others injured.

May 15, 1998 : President Soeharto returned from Egypt earlier than expected. Foreign companies and embassies evacuated staff and family out of Indonesia.

May 16, 1998 : President Soeharto proposed a reshuffling of his cabinet members to solve the current situation.

May 18, 1998 : Mr. Harmoko, the Speaker of the House of Representatives, called on president Soeharto to step down. People called to eliminate collusion, corruption, and nepotism.

May 20, 1998 : The Indonesian parliament building in Jakarta was occupied by thousands of students demanding that president Soeharto resigned. Fourteen ministers of president Soeharto's cabinet announced their resignation.

May 21, 1998 : President Soeharto announced his resignation as president of the Republic of Indonesia (Garran, 1998). The resignation of president Soeharto came after the worst situation when demonstrating students were shot, also the country was engulfed in riots and looting which led to an increase in fuel prices. President Soeharto was replaced by the vice president B.J. Habibie. With this change, political and economic reforms were being applied by the Indonesian government.

May 22, 1998 : President B.J. Habibie swore in his cabinet members.

May 29, 1998 : The Indonesian government announced the next election in 1999.

June 2, 1998 : Former president Soeharto was investigated by the Indonesian government with regard to his wealth.

June 24, 1998 : The average exchange rate was Rp 14,900 per US dollar. The Indonesia's agreement with the International Monetary Fund (IMF) was revised for the third time. The Indonesian government again delivered the Second Supplementary Memorandum of Economic and Financial Policies. Its most important points were:

1) increasing social expenditure to a level equivalent to 7.5 percent of Gross Domestic Product (GDP);
2) rehabilitating and strengthening the distribution system following the disruption caused by social disturbances;
3) restructuring the banking system, moving swiftly to recapitulate, merge, and close the weak banks.

July 29, 1998 : The average exchange rate was Rp 13,000.00 per US dollar. Indonesia's agreement with the IMF was revised for the fourth time. The Indonesian government issued a Letter of Intent and Memorandum of Economic and Financial Policies. The letter:

1) described the progress in restructuring the banking system;

2) officially launched the Indonesian Debt Restructuring Agency (INDRA); and

3) discussed the distribution system and the social safety net. The Rupiah reached 15,000.00 against a US dollar when there was chaos of regional instability in Irian Jaya and East Timor.

August, 1998 : The average exchange rate was Rp 11,075.00 per US dollar. The International Monetary Fund (IMF) endorsed the disbursement of US $ 460 million. The World Bank delivered a warning that the World Bank would stop a loan if the Indonesian government did not solve the Bank Bali scandal appropriately, as this scandal had depleted investor's confidence. The bank Bali scandal spotlighted on the Rupiah 546 billion (US $ 78 million) to PT Era Giat Prima (PT EGP) that is managed by a former deputy treasurer of president B.J. Habibie's ruling Golongan Karya (GOLKAR) party. Rupiah 546 billion (US $ 78 million) was a fee for letting the Indonesian Bank Restructuring Agency (IBRA) to pay bank Bali Rupiah 904 billion (US $ 146 million) owed by a bank that was taken by the Indonesian Bank Restructuring

Agency (IBRA). The Indonesian Bank Restructuring Agency (IBRA) stated that the repayment of interbank claims on closed-down banks did not need the services of any third party as the claims were insured by the agency.

September 11, 1998: The average exchange rate was Rp 10,700.00 per US dollar. Another Letter of Intent and Supplementary Memorandum of Economic and Financial Policies was issued. The main points of the letter were:

1) measures to improve the food situation in terms of both availability and price were being implemented. The program for providing subsidized rice to at least 7.5 million poor families was extended. BULOG's monopoly on a number of food commodities was eliminated;
2) framework designed to promote voluntary restructuring of corporate debt was established;
3) and the efficiency and transparency of the newly established special commercial court was enhanced.

The International Monetary Fund (IMF) threatened to stop financial aid to Indonesia if it did not control the violence in East Timor. East Timor had become a place of bloodshed and terror, in an attempt to gain independence from Indonesia. Further more, the United Nations peacekeeping forces were going to East Timor to control the situation in East Timor. The International

Monetary Fund (IMF) further stated that it was upset with the approach Indonesian government took to solve the Bank Bali scandal. As a result, a US $ 120 million loan would be discontinued by the Asian Development Bank (ADB) if Indonesian government does not resolve Bank Bali scandal in October 1998.

October 19, 1998 : The average exchange rate was Rp 7,550.00 per US dollar. Another Letter of Intent and Supplementary Memorandum of Economic and Financial Policies was issued. The letter described further banking reforms.

October 29, 1998 : The Indonesian government started a bank recapitalization scheme.

November 13, 1998: The average exchange rate was Rp 7,300.00 per US dollar. Another Letter of Intent and Supplementary Memorandum of Economic and Financial Policies were issued by the Indonesian government. The letter described further enhancement of the social safety net. The Indonesian government announced liquidation of 16 private sector banks. The announcement caused panic in depositors, which initiated the liquidity crisis that developed into banking crisis. The liquidity crisis that happened was the banks lacked sufficient cash to expand the inventory which caused banking crisis such as a case that bank does not have enough public funding.

December 16, 1998: The average exchange rate was Rp 8,025.00 per US dollar. US $ 1 billion was disbursed by the International Monetary Fund (IMF).

## 3.2. Chronology of the 1997-1998 Asian Financial Crisis in Malaysia

Bilateral and multilateral programs such as International Monetary Fund aid package Indonesia adopted were not implemented by the Malaysian government to handle the crisis. Instead the Malaysian government applied the International Monetary Fund (IMF) approaches such as: a) reducing the current account deficit; b) keeping fiscal regulation; and c) maintaining a steady banking system.

Before the crisis, Malaysia had a good economic performance. Malaysian average real Gross Domestic Products (GDP) growth was 8.0 percent per year in the decade before 1997, unemployment rate averaged 2.7 percent, and the average inflation rate of 2.8 percent per year.

However, the Asian financial crisis caused economic and political problems in Malaysia too. In the 1997 and 1998, the average Malaysian economic growth real Gross Domestic Product (GDP) was 7.5 percent and –6.5 percent respectively (Appendix Table A-11). The inflation rate was 2.50 percent in 1997 and 5.50 percent in 1998 (Appendix Table A-12), and the Malaysian Ringgit depreciated from RM 2.4868 per US dollar to be RM 4.2200 per US dollar from 1997 to 1998 (Appendix Table A-13.). A real political problem arose when the Malaysian government dismissed Mr. Anwar Ibrahim as the deputy prime minister and finance minister. The chronology of the crisis and the Malaysian government policies to cope with the crisis are stated below:

April, 1997 : The Malaysian Ringgit (RM) per US dollar increased from 2.4868 to 2.5110. The Central Bank of Malaysia (Bank Negara Malaysia or BNM) announced that bank lending for property and purchase of stock were limited. The Central Bank of Malaysia called this a reform package, where loans to property were decreased from 40 percent to 20 percent.

May, 1997 : The average exchange rate was RM 2.5140 per US dollar

June, 1997 : The average exchange rate was RM 2.5235 per US dollar. Ringgit, the Malaysian currency had lost confidence from investors.

July 2, 1997 : The average exchange rate was RM 2.6360 per US dollar. An amount RM 10 billion was pumped by the Central Bank of Malaysia, which was the foreign reserve to support Malaysian Ringgit in speculation that the country might have a crisis (Kaplan and Ke).

July 8, 1997 : The Central Bank of Malaysia intruded to protect the Malaysian Ringgit by inducting US $ 4 billion, and it also increased the domestic interest rate.

July 14, 1997 : The Central Bank of Malaysia was left with no option to allow the Malaysian Ringgit to float without restraint.

July 24, 1997 : The Malaysian Ringgit was melted down, with more depreciation. The Malaysian Prime Minister Dr. Mahathir Mohamad blamed mischievous speculators as the cause for the depreciation of

Malaysian Ringgit (The United Kingdom Executive Council for Malaysian Students).

July 26, 1997 : Mr. George Soros (the international hedge fund and speculator manager) was alleged as the culprit for the depreciation of the Malaysian Ringgit by the Prime Minister Dr. Mahathir Mohamad (The United Kingdom Executive Council for Malaysian Students).

August 20, 1997 : The average exchange rate was RM 2.9620 per US dollar. Standard & Poor's downgraded Malaysia's sovereign rating from "positive" to "stable" (Wong).

August 23, 1997 : Again, the Malaysian Prime Minister Dr. Mahathir Mohammad blamed Mr. George Soros for leading the attack not only on Malaysian Ringgit but also on other East Asian currencies (The United Kingdom Executive Council for Malaysian Students).

August 28, 1997 : Rents in the capital have already started to fall. In trying to support the real estate prices, the Malaysian government eliminated a levy on foreigners' purchases of property (Wong).

August 29, 1997 : The short selling of shares was effectively banned by the Kuala Lumpur Stock Exchange (KLSE).

September 4, 1997 : The average exchange rate was RM 3.1975 per US dollar. To handle the crisis, the Malaysian government tried to reduce government spending. As a result, a number of multi-million dollar construction projects were held up by Prime Minister Dr.

Mahathir Mohamad (The United Kingdom Executive Council for Malaysian Students). Again, RM 60 billion endowment was set by the Malaysian government to prop up the national stock market that was already on a downward plunge and to put up a defense against alleged racist foreign speculators (Wong).

September 5, 1997 : The ban on short selling of shares was reversed by Prime Minister Dr. Mahathir Mohamad, and he announced that again the Malaysian government should delay several large projects including the Bakun Dam project (Kaplan and Ke).

September 22, 1997: At the annual meeting of the International Monetary Fund (IMF) and the World Bank in Hong Kong, the Malaysian Prime Minister Dr. Mahathir Mohamad was still blaming Mr.George Soros for the financial crisis in Malaysia and its consequences. Meanwhile, the Deputy Prime Minister and finance minister, Mr. Anwar Ibrahim tried to consolidate the Malaysian financial problem by using economic management which included putting off several large infrastructure projects of Malaysia, reducing Malaysia's current account deficit, and cutting the Malaysian government public spending by 2 percent.

October 1, 1997 : The average exchange rate was RM 3.4370 per US dollar. The Malaysian Prime Minister Dr. Mahathir Mohamad called for tighter regulation or a total ban on foreign exchange trading, and he suggested that currencies should be linked to the economic

indices of the country concerned (The United Kingdom Executive Council for Malaysian Students).

October 7, 1997 : There was a rumor that Dr. Mahathir Mohamad would resign, but Dr. Mahathir Mohamad announced that the rumor was wrong. He criticized foreigners for allegedly trying to oust him by sowing discord between him and his deputy minister Mr. Anwar Ibrahim (Kaplan and Ke).

October 17, 1997 : Again the Malaysian government announced a belt-tightening budget to try to stop the economy sliding into recession (The United Kingdom Executive Council for Malaysian Students). In the budget, the Malaysian government projected to have 7 percent growth, a 1.9 percent increase in government spending, and a cut in corporate taxes from 30 percent to be 28 percent in anticipation of the crisis (Kaplan and Ke).

November, 1997 : The average exchange rate was RM 3.5010 per US dollar.

December 4, 1997 : The average exchange rate was RM 3.8883 per US dollar. In evaluating all economic matters in the crisis, Prime Minister Dr. Mahathir Mohamad announced the establishment of the National Economic Action Council (NEAC). Mr. Daim Zainuddin, the former Malaysian finance minister is the chairman of the council. A project of an expensive land bridge is being built (The United Kingdom Executive Council for Malaysian Students).

December 5, 1997 : Once more, in an effort to re-establish the confidence in the

Malaysian economy, the Malaysian finance minister announced cutbacks on several large projects (The United Kingdom Executive Council for Malaysian Students), and intentions to tighten credit were announced. He proposed to cut Malaysian government spending by 18 percent, and to cut the expensive import goods (Garran, 1998).

December 8, 1997 : Once more, Mr. Anwar Ibrahim, the Deputy Prime Minister and finance minister pledged to slash government spending, curb big-ticket imports, and restrict bank credits and stock market fund raising (The United Kingdom Executive Council for Malaysian Students).

December 22, 1997: Moody's Investor Service downgraded the Malaysian sovereign debt to junk bond status (The United Kingdom Executive Council for Malaysian Students).

January 3, 1998 : The average exchange rate was RM 4.5450 per US dollar. In an attempt to restore confidence in the Malaysian banking system, the Bank Negara Malaysia (the Central Bank of Malaysia) proposed merging finance companies and commercial banks (Wong).

January 20, 1998 : Starting today, depositors were given safety guarantee of their money from Bank Negara Malaysia.

February 6, 1998 : The average exchange rate was RM 3.6750 per US dollar. The Malaysian government stated that the 39 finance companies in

Malaysia must merge into 6 groups (Wong).

February 7, 1998 : The Bank Negara Malaysia announced that it is reducing the statutory reserve requirements (SSR) of banking institutions (Kaplan and Ke).

March 25, 1998 : The average exchange rate was RM 3.6430 per US dollar. A Program to consolidate finance companies and to recapitulate commercial banks is announced by the Malaysian government.

April, 1998 : The average exchange rate was RM 3.7365 per US dollar. There was a conflict between the Prime Minister Dr. Mahathir Mohamad and the Deputy Minister Mr. Anwar Ibrahim about the interest rate policy that the Malaysian government should apply (Haggard, 2000).

May, 1998 : The average exchange rate was RM 3.8785 per US dollar.

June 20, 1998 : The average exchange rate was RM 4.1750 per US dollar. Pengurusan Danaharta Nasional Bhd (Danaharta), an asset management company was established under the ministry of finance (Haggard, 2000). The former finance minister Mr. Daim Zainuddin, a long time confidant of Dr. Mahathir Mohamad was appointed as a special minister to the cabinet.

July 7, 1998 : The average exchange rate was RM 4.1425 per US dollar. The Malaysian government asked Japan to lend more than US $ 713 million in support of its public work program in its economic crisis (Wong).

August 10, 1998 : The average exchange rate was RM 4.2200 per US dollar. Danamodal Nasional Bhd (Danamodal) was established as a bank restructuring and recapitalization with the assistance of two foreign investment banks, Salomon Smith Barney and Goldman Sachs (Haggard, 2000). There was a major conflict in the Malaysian government, between Prime Minister Dr. Mahathir Mohamad and Deputy Prime Minister Mr. Anwar Ibrahim. The deputy prime minister proposed to follow the International Monetary Fund (IMF) prescriptions, such as a) tight money; b) prudent fiscal policy; c) open up the economy to foreign capital without actually asking for the International Monetary Fund (IMF) aid.

August 29, 1998 : The governor and deputy governor of Bank Negara Malaysia (Malaysian central bank) resigned over policy differences with Prime Minister Dr. Mahathir Mohamad.

September 1, 1998 : The average exchange rate was RM 3.8000 per US dollar. The Malaysian government announced capital controls, proposed that the exchange rate would be pegged. Also, it released the disclosure requirements, and adopted measures to stimulate bank lending.

September 2, 1998 : The Malaysian government announced that Mr. Anwar Ibrahim was sacked as a deputy prime minister and finance minister (Mckee). This announcement was followed by protests and

demonstrations by the supporters of Mr. Anwar Ibrahim.

September 20, 1998: Mr. Anwar Ibrahim (former deputy prime minister and finance minister) was arrested under the Malaysian Internal Security Act.

October 1, 1998 : The average exchange rate was RM 3.8000 per US dollar. The government implemented exchange controls, fixing the Ringgit exchange rate at RM 3.80 to the US dollar (Kaplan and Ke).

November, 1998 : The average exchange rate was RM 3.8000 per US dollar.

December 12, 1998: The average exchange rate was RM 3.8000 per US dollar. Foreigners are offered incentives such as increased loan financing and discounts to boost the local property market.

The 1997-1998 Asian financial crises caused Indonesian and Malaysian currency depreciated from Rp 2,207.00 to Rp 14,900.00 for Indonesia and from RM 2.4832 to RM 4.5450 for Malaysia against US dollar, and affected the banking troubles. Alongside the economic problems, the Asian financial crisis created the political problems in Indonesia and Malaysia. The political problems impacted the change of president in Indonesia and forced the step down of deputy prime minister and finance minister in Malaysia. In coping with the crisis, Indonesia and Malaysia governments reduced their budget spending by canceling some its government projects. Indonesia got help from the International Monetary Fund (IMF) aids while Malaysia did not.

# CHAPTER IV

# GOVERNMENT POLICIES AFFECTING THE PALM OIL AND PALM KERNEL OIL INDUSTRY

## 4.1. Indonesian Government Policies

Because of the importance of palm oil for food security, the Indonesian government has used several policy interventions including: 1) export tariffs; 2) government purchases and sales through BULOG intervention (BULOG is the National Logistic Agency); and 3) activities of a quasi government company PT Perkebunan Nusantara in the domestic market (Larson, 1996).

The export tariff rates have been from 2 to 60 percent. Tariffs were implemented to decrease and stabilize the wholesale and the retail prices in the domestic cooking oil market. Export tariffs could help domestic consumers afford cooking oil. Conversely, for producers, the export tariffs increase the cost of exporting and cause greater emphasis on the domestic market.

BULOG intervention in Indonesian palm oil and palm kernel oil market began in 1995. The objective of BULOG intervention was to reduce and stabilize prices of domestic cooking oil. BULOG implemented buffer stocks to accomplish its objectives. To stabilize domestic cooking oil prices BULOG increased the quantity of buffer stocks. BULOG imported palm oil and palm kernel oil products when domestic production was not adequate. BULOG had the power to manage, allocate, and market the palm oil and

palm kernel oil products of smallholders, government estate companies, and the private companies. Like BULOG, PT Perkebunan Nusantara a government estate company production is utilized primarily to stabilize the domestic price of cooking oil. PT Perkebunan Nusantara supplied more than 60 to 70 percent of domestic crude palm oil (CPO). To market and sell its product for the domestic market as well as exports, PT Perkebunan Nusantara employs a state agency trading company the Joint Marketing Office (JMO). In addition to selling and marketing PT Perkebunan Nusantara's palm oil and palm kernel oil products, the Joint Marketing Office (JMO) helps smallholders market their palm oil and palm kernel oil products.

Generally, there are three markets for crude palm oil (CPO) in Indonesia. First, all crude palm oil (CPO) from government estate plantations (such as PT Perkebunan Nusantara) and smallholders must be sold through Joint Marketing Office (JMO) for domestic and export market. Second, crude palm oil (CPO) from foreign-owned private estates that is allocated to the domestic market must use the Joint Marketing Office (JMO). Third, crude palm oil (CPO) from private estate plantations owned by Indonesian citizens is not subject to domestic allocation and is not required to be marketed through the Joint Marketing Office (JMO).

In the beginning of 1997 the food, agriculture, and industry in Indonesia were weakened by the economic crisis and financial dilemmas. Major issues of the crisis were financing trade, food shortages, contraction of agricultural imports, and increasing food and commodity prices.

During the crisis 1997 to 1998, food commodity prices increased 56 percent. Cooking oil prices rose by 107 percent. Increasing cooking oil and rice prices caused

panic, social demonstrations and riots. People stocked cooking oil in anticipation of a price increase. The cooking oil stocking phenomena caused cooking oil to be hard to find and its price increased further. To solve the cooking oil crisis, the Indonesian government further intervened the Indonesian palm oil and palm kernel oil industries as described below.

Some policies applied in anticipation of the economic crisis in Indonesia particularly for Indonesian domestic cooking oil are described below:

September, 1994 : The Indonesian government applied export tariff for palm oil and palm kernel oil products that will be sold overseas. The method that is used to compute the palm oil and palm kernel oil export tariff is as:

ET = EV x T x (EP-FP) x ER

Where:

ET = export tariff

EV = export volume

T = export tariff rate

EP = export price or freight on board (FOB) price

FP = floor price or the maximum export price which was free from export tariff.

ER = exchange rate

January, 1997 : The average cooking oil price in Indonesia was Rp 2,134.00 per kilogram. The Indonesian government announced that the government now prohibited foreign investments in palm oil

plantations.

February, 1997 : The average cooking oil price was Rp 2,133.00 per kilogram.

March, 1997 : The average cooking oil price was Rp 2,124.00 per kilogram. The Indonesian government resumed giving investment licenses for foreign investors with a note that they must open and develop new palm oil plantations only in the eastern region of Indonesia and must have a partnership with smallholders.

April-June, 1997 : The average domestic cooking oil price was Rp 2,121.00 per kilogram. The Asian financial crisis started in Indonesia.

July, 1997 : The average domestic cooking oil price was Rp 2,103.00 per kilogram. The Indonesian government announced the Deregulation Package to decrease the export tariff rates on palm oil and palm kernel oil products ranging from 10 to 12 percent to 2 to 5 percent. The new tariff rates are 5 percent on crude palm oil (CPO); 4 percent on refined bleached deodorized palm oil (RBD palm oil); 4 percent on crude olein; and 2 percent on refined bleached deodorized olein (RBD olein). A new method to calculate the palm oil and palm kernel oil export tariff is also released, which is:

ET = T x TFV x ER

Where:

ET = export tax (Rupiah)

T = export tariff rates

TFV = total freight on board (FOB) value (US dollar)

ER = exchange rate (Rupiah per US dollar)

Compare with the older method, the variable T and ER are the same. TFV is the new variable which is formed from the method {EV x (EP-FP)}, where EV is export volume, EP is export price, and FP is floor price.

August, 1997 : The average domestic cooking oil price was Rp 2,113.00 per kilogram.

September, 1997 : The average domestic cooking oil price was Rp 2,165.00 per kilogram. The Indonesian government asked BULOG to increase the quantity of crude palm oil (CPO) domestic purchases from PT Perkebunan Nusantara.

October, 1997 : The average domestic cooking oil price rose to Rp 2,387.00 per kilogram.

November, 1997 : The average domestic cooking oil price was Rp 2,402.00 per kilogram. The Indonesian government announced that the Indonesian Minister of Agriculture had established export restrictions for Indonesian palm oil and palm kernel oil products (quota distribution). The export restriction will be applied in December 1997. The restriction stated that the crude palm oil (CPO) producers were required to restrict their exports of crude palm oil (CPO) to 25 percent of their total production, and producers were not allowed to export their crude palm oil (CPO)

until they had already confirmed that they have kept 75 percent of their crude palm oil (CPO) for the Indonesian domestic markets. The export restrictions were designed to decrease the current inflation tension caused by the increasing domestic prices of cooking oil.

December 17, 1997 : The Indonesian government increased export tariff rates palm oil and palm kernel oil products from a range of 2 to 5 percent to 30 percent.

December 24, 1997 : The average domestic cooking oil price was Rp 2,578.00 per kilogram. The Indonesian government released a Distribution Letter stating that from December 24, 1997 to April 1998 all Indonesian palm oil and palm kernel oil product exports are banned.

January, 1998 : The average domestic cooking oil price was Rp 3,357.00 per kilogram. The Indonesian government announced that foreign investment on palm oil plantations is now allowed again. This statement was released as reconciliation with the International Monetary Fund (IMF) under the Letter of Intent.

February, 1998 : The average domestic cooking oil price was Rp 4,288.00 per kilogram. The Indonesian government announced that only Indonesian palm kernel oil and stearin could be exported. Sixty percent of total stearin stock can be exported and 100 percent of palm kernel oil stock can be exported (FAS). Exports of other

palm oil and palm kernel oil products such as crude palm oil (CPO), refined bleached deodorized palm oil (RBD palm oil), crude olein, refined bleached deodorized olein (RBD olein), are prohibited.

March, 1998 : The average domestic cooking oil price was Rp 4,204.00 per kilogram.

April, 1998 : The average domestic cooking oil price was Rp 4,226.00 per kilogram. This month, the Indonesian government removed the ban on exports for Indonesian crude palm oil (CPO) as a feedback to the International Monetary Fund (IMF) Letter of Intent that was signed in January 1998. The government set the new export tariffs of 40 percent on crude palm oil (CPO); 35 percent on refined bleached deodorized palm oil (RBD palm oil); 40 percent on crude olein; 35 percent on refined bleached deodorized olein (RBD olein); 35 percent on crude stearin; 30 percent on refined bleached deodorized stearin (RBD stearin); 35 percent on crude palm kernel oil (CPKO); 30 percent on refined bleached deodorized palm kernel oil (RBD palm kernel oil). Starting this month, investment licenses for new palm oil plantations by new foreign investors will be temporarily stopped and some private refineries were picked by the government to process crude palm oil (CPO) from PT Perkebunan Nusantara, and its distribution will be handled by BULOG (the National

Logistic Agency).

May 25, 1998 : The average domestic cooking oil price was Rp 4,653.00 per kilogram. The Indonesian government announced that the government halted processing by selected private refineries of crude palm oil (CPO) PT Perkebunan Nusantara. Starting today, BULOG will not distribute cooking oil of which the crude palm oil (CPO) was from PT Perkebunan Nusantara, but BULOG will still distribute cooking oil from private plantations.

June, 1998 : The average domestic cooking oil price rose to Rp 5,100.00 per kilogram.

July 14, 1998 : The average domestic cooking oil price rose to Rp 6,288.00 per kilogram. The Indonesian government attempted to further restrict the increasing domestic retail cooking oil price by increasing export tariffs on palm oil and palm kernel oil products. Export tariff rates on crude palm oil (CPO) increased from 40 to 60 percent; from 35 to be 50 percent for crude palm kernel oil; 60 percent on crude palm olein; 55 percent on refined bleached deodorized olein (RBD olein); 55 percent on refined bleached deodorized palm oil (RBD palm oil); 25 percent on crude stearin; 20 percent on refined bleached deodorized stearin (RBD stearin); 45 percent on refined bleached deodorized palm kernel oil (RBD palm kernel oil). The Indonesian government also announced that BULOG would not manage the marketing

of palm oil and palm kernel oil products. BULOG now no longer has the authority to buy palm oil and palm kernel oil products from PT Perkebunan Nusantara and private companies.

August, 1998 : The average domestic cooking oil price was Rp 6,302.00 per kilogram.

September, 1998 : The average domestic cooking oil price was Rp 6,336.00 per kilogram.

October, 1998 : The average domestic cooking oil price was Rp 5,806.00 per kilogram.

November, 1998 : The average domestic cooking oil price was Rp 5,525.00 per kilogram.

December, 1998 : The average domestic cooking oil price was Rp 5,635.00 per kilogram.

January, 1999 : The average domestic cooking oil price was Rp 4,529.00 per kilogram.

February, 1999 : The average domestic cooking oil price was Rp 4,688.00 per kilogram. The Indonesian government announced that the government decreased the export tariff rates: 1) crude palm oil (CPO) from 60 to 40 percent; 2) refined bleached deodorized palm oil (RBD palm oil) from 60 to 40 percent; 3) crude palm olein from 65 to 40 percent; 4) refined bleached deodorized olein (RBD olein) from 55 to 32 percent; 5) crude palm stearin from 25 to 20 percent; 6) refined bleached deodorized palm

stearin (RBD palm stearin) from 20 to 10 percent; 7) crude palm kernel oil (CPKO) from 50 to 30 percent; 8) refined bleached deodorized palm kernel oil (RBD palm kernel oil) from 45 to 20 percent.

March, 1999 : The average domestic cooking oil price was Rp 4,200.00 per kilogram.

April, 1999 : The average domestic cooking oil price was Rp 4,430.00 per kilogram.

May, 1999 : The average domestic cooking oil price was Rp 4,447.00 per kilogram.

June, 1999 : The average domestic cooking oil price was Rp 4,029.00 per kilogram. The Indonesian government announced that the government yet again decreased the export tariff rates for palm oil and palm kernel oil products: 1) crude palm oil (CPO) export tariff rate has been decreased from 40 to 30 percent; 2) refined bleached deodorized palm oil (RBD palm oil) from 32 to 22 percent; 3) crude olein from 40 to 26 percent; 4) refined bleached deodorized palm olein (RBD palm olein) from 32 to 22 percent; 5) crude palm stearin from 20 to 15 percent; 6) refined bleached deodorized stearin (RBD stearin) from 10 to 7 percent; 7) crude palm kernel oil (CPKO) from 30 to 20 percent.

July, 1999 : The average domestic cooking oil price was Rp 3,605.00 per kilogram. Once more the Indonesian government announced

that export tariff rates on crude palm oil (CPO) would be decreased from 30 percent to 10 percent as specified in the agreement with the International Monetary Fund (IMF); from 22 to 6 percent for refined bleached deodorized olein (RBD olein); from 26 to 8 percent for crude olein; from 22 to 6 percent for refined bleached deodorized olein (RBD olein); from 15 percent to zero for crude palm stearin; from 7 percent to zero for refined bleached deodorized stearin (RBD stearin); from 20 percent to zero for crude palm kernel oil (CPKO); and from 15 percent to zero for refined bleached deodorized palm kernel oil (RBD palm kernel oil).

August, 1999 : The average domestic cooking oil price was Rp 6,107.00 per kilogram.

September, 1999 : The average domestic cooking oil price was Rp 5,963.00 per kilogram.

October, 1999 : The average domestic cooking oil price was Rp 6,214.00 per kilogram.

November, 1999 : The average domestic cooking oil price was Rp 4,000.00 per kilogram.

December, 1999 : The average domestic cooking oil price was Rp 3,775.00 per kilogram.

Before the crisis in June 1997, the average price of domestic cooking oil in Indonesia was Rp 2,121.00 per kilogram. When the crisis started in June 1997, the price of domestic cooking oil was Rp 2,112.00 per kilogram. In October 1997, the domestic cooking oil price increased to more than Rp 2,500.00 per kilogram (Figure 4.1.). The Indonesian government tried to decrease the domestic cooking oil price to under Rp 3,000 per kilogram by imposing export restrictions (ER) on palm oil and palm kernel oil in December 1997. Imposing export restrictions did not reduce and stabilize domestic cooking oil prices (Figure 4.1.). Domestic cooking oil prices continued to increase.

While the export restriction policy was being applied, large quantities of palm oil and palm kernel oil products continued to be exported (Figure 4.2.). Incentives to export were great because the world price of palm oil products was high and increasing (Figure 4.3.).

In the beginning of December 1997, the Indonesian government applied to set higher export tariff rate on palm oil and palm kernel oil products (IT I), domestic cooking oil prices continued to increase and reached more than Rp 4,000.00 per kilogram (Figure 4.1.). In the last week of December 1997 the Indonesian government changed the export tariff rate (IT I) with export ban for all palm oil and palm kernel oil products (B). The cooking oil domestic price was still above Rp 4,000.00 per kilogram (Figure 4.1.). By February 1998, the domestic cooking oil prices appeared to decrease. The export ban policy (B) ended in April 1998. In April 1998 the Indonesian government allowed palm oil and palm kernel oil products to be exported subject to an export tariff. This was a response to an order from the IMF to qualify the aid packages to be delivered to

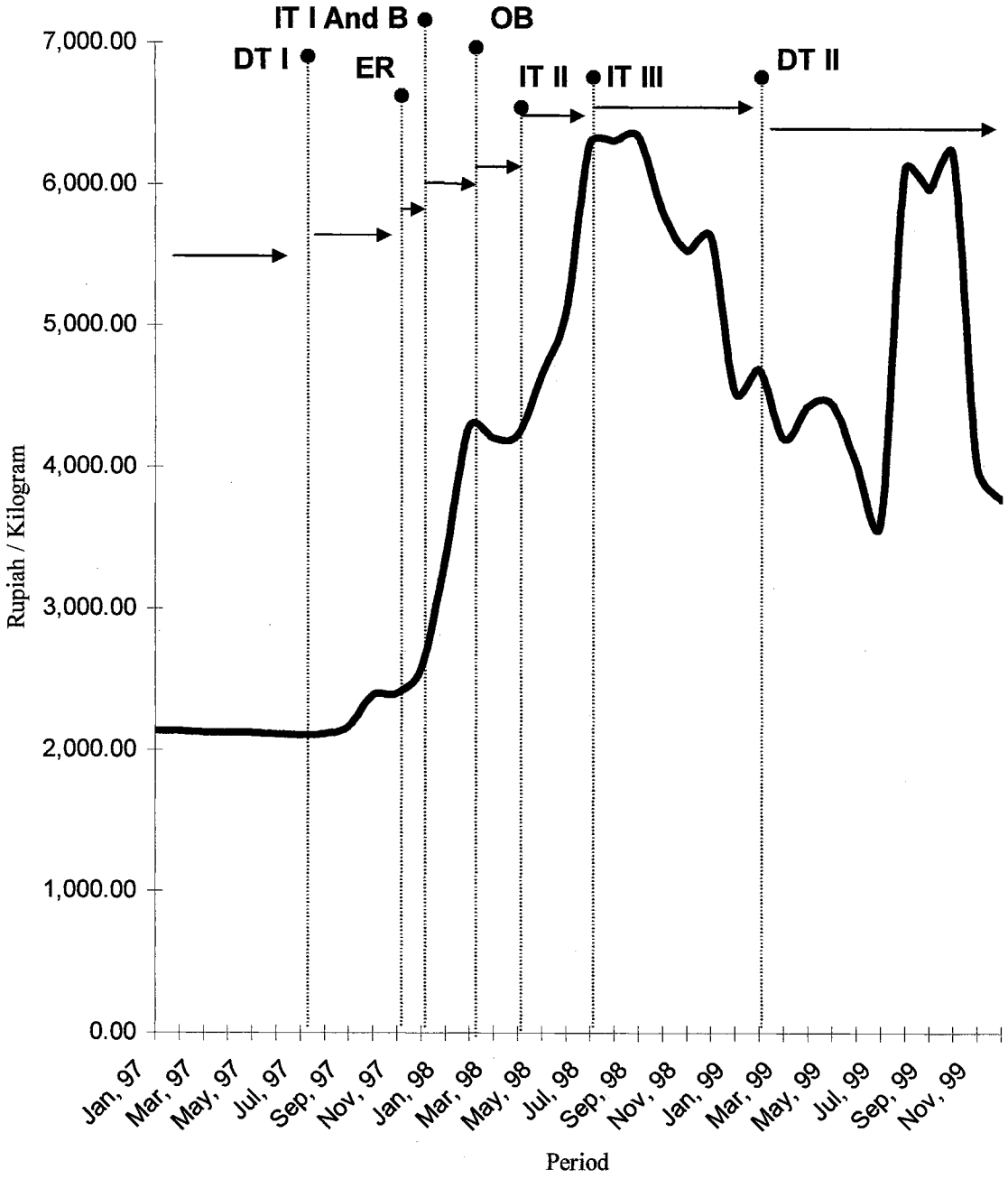


Figure 4.1. Average Domestic Prices of Cooking Oil in Indonesia, January 1997 to December 1999

Source: Badan Pusat Statistik; Foreign Agricultural Service, USDA

Note:

| | |
|---|---|
| DT I | = decrease export tariff rate on palm oil and palm kernel oil products from range 10 to 12 percent to range 2 to 5 percent |
| ER | = export restriction on palm oil and palm kernel oil productions |
| IT I | = increase export tariff rate on palm oil and palm kernel oil products from range 2 to 5 percent to around 10 percent |
| B | = palm oil and palm kernel oil products are banned for export |
| OB | = palm oil products are banned for export, but palm kernel oil products are still allowed for export. |
| IT II | = now palm oil and palm kernel oil products are allowed to export with export tariff rate in range 30 to 40 percent |
| IT III | = increase export tariff rate on palm oil and palm kernel oil products from range 30 to 40 percent to 45 to 60 percent |
| DT II | = decrease export tariff rate on palm oil and palm kernel oil products from range 45 to 60 percent to 20 to 55 percent |

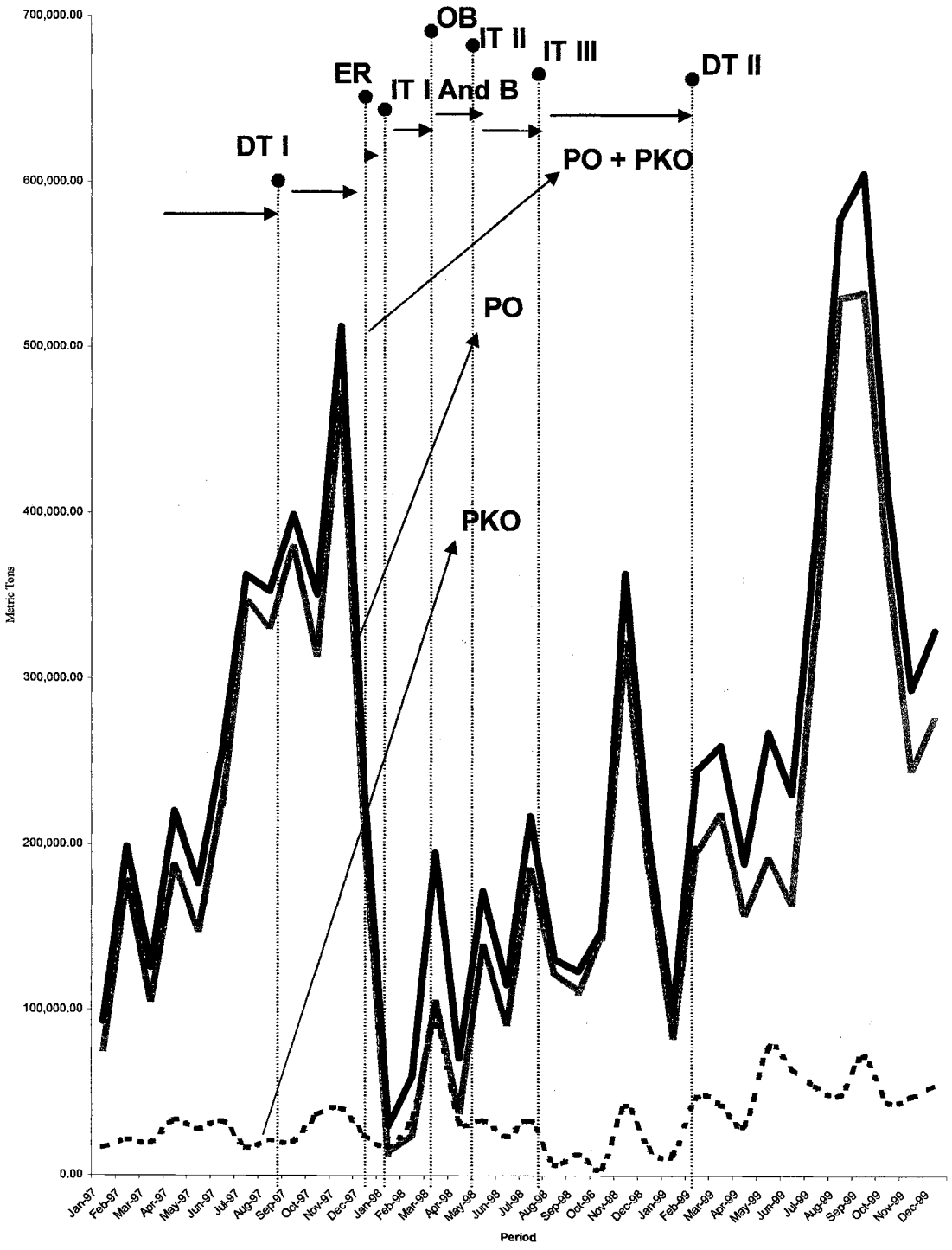


Figure 4.2. Palm Oil (PO) and Palm Kernel Oil (PKO) Export from Indonesia, January 1997 to December 1999.

Source: Badan Pusat Statistik

Note:

| | |
|---|---|
| DT I | = decrease export tariff rate on palm oil and palm kernel oil products from range 10 to 12 percent to range 2 to 5 percent |
| ER | = export restriction on palm oil and palm kernel oil productions |
| IT I | = increase export tariff rate on palm oil and palm kernel oil products from range 2 to 5 percent to around 10 percent |
| B | = palm oil and palm kernel oil products are banned for export |
| OB | = palm oil products are banned for export, but palm kernel oil products are still allowed for export. |
| IT II | = now palm oil and palm kernel oil products are allowed to export with export tariff rate in range 30 to 40 percent |
| IT III | = increase export tariff rate on palm oil and palm kernel oil products from range 30 to 40 percent to 45 to 60 percent |
| DT II | = decrease export tariff rate on palm oil and palm kernel oil products from range 45 to 60 percent to 20 to 55 percent |
| PO | = palm oil |
| PKO | = palm kernel oil |

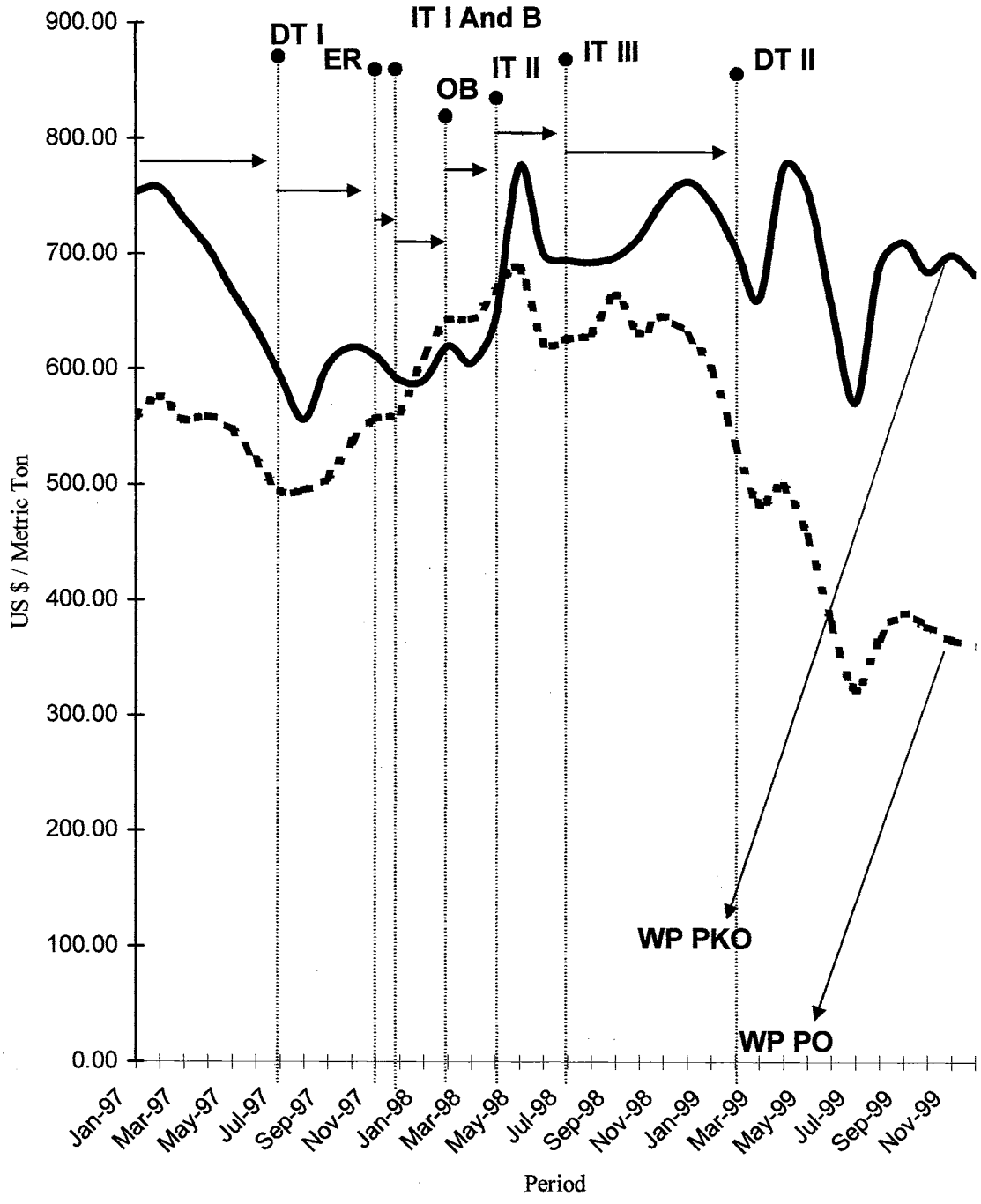


Figure 4.3. World Average Prices of Palm Oil and Palm Kernel Oil, January 1997 to December 1999

Source: Palm Oil Registration and Licensing Authority, 1998; Palm Oil Registration and Licensing Authority, 1999; Malaysian Palm Oil Board, 2000

Note:

| | |
|---|---|
| DT I | = decrease export tariff rate on palm oil and palm kernel oil products from range 10 to 12 percent to range 2 to 5 percent |
| ER | = export restriction on palm oil and palm kernel oil productions |
| IT I | = increase export tariff rate on palm oil and palm kernel oil products from range 2 to 5 percent to around 10 percent |
| B | = palm oil and palm kernel oil products are banned for export |
| OB | = palm oil products are banned for export, but palm kernel oil products are still allowed for export. |
| IT II | = now palm oil and palm kernel oil products are allowed to export with export tariff rate in range 30 to 40 percent |
| IT III | = increase export tariff rate on palm oil and palm kernel oil products from range 30 to 40 percent to 45 to 60 percent |
| DT II | = decrease export tariff rate on palm oil and palm kernel oil products from range 45 to 60 percent to 20 to 55 percent |
| WP PO | = world prices of palm oil |
| WP PKO | = world prices of palm kernel oil |

Indonesia. The palm oil and palm kernel oil products were exported subject to the higher export tariff rate (IT II).

When the Indonesian government implemented IT II, the domestic cooking oil price increased more than Rp 6,000.00 per kilogram (Figure 4.1.). After three months of application of IT II, the Indonesian government decided to change the policy by further increasing the export tariff rate. This new policy was the highest export tariff rate (IT III) that the Indonesian government had set in its domestic palm oil and palm kernel oil industry. Under the new export tariff rate, IT III, the domestic cooking oil price decreased to under Rp 5,000.00 per kilogram from Rp 7,000.00 per kilogram.

The Indonesian government applied the highest export tariff rate, IT III for 7 months. After that, the Indonesian government began to reduce the export tariff rate in order to add more foreign exchange income from palm oil and palm kernel oil exports and to improve conditions in the domestic palm oil and palm kernel oil industry. The Indonesian government reduced the export tariff rate (DT II) from IT III, the domestic cooking oil price decreased from under Rp 5,000.00 per kilogram to Rp 4,000.00 per kilogram after four months of applying DT II (Figure 4.1.). In the fifth month of DT II, the domestic cooking oil price increased again reaching more than Rp 6,000.00 per kilogram (Figure 4.1.).

## 4.2. Malaysian Government Policies

The Asian financial crisis also affected the Malaysian palm oil industry. Malaysia did not have a problem with its domestic cooking oil price like Indonesia, which

Indonesian government had to apply some policies for its palm oil and palm kernel oil industry to stabilize its domestic cooking oil prices.

During and after the crisis of 1997-1998, the Malaysian government did not change and/or apply any new policies in the palm oil and palm kernel oil industry. Instead, the policy on palm oil and palm kernel oil export tariff rates were same as before and after the crisis. The policy that the Malaysian government applied in palm oil and palm kernel oil export tariffs as stated by the Ministry of Finance Malaysia is given below which some samples are listed in Appendix Table A-14:

1. Crude Palm Oil (CPO)

   The export duties (export tariffs) is based on the gazetted value of crude palm oil (CPO). It is only levied at a price level exceeding RM 650.00 per ton, which is estimated to be the cost of production. On the first RM 650.00 per ton, the export duty is nil; on the next RM 50.00 per ton, the export duty is 10 percent; Plus on the next Malaysian Ringgit 50.00 per ton, the export duty is 15 percent; on the next Malaysian Ringgit 50.00 per ton, the export duty is 20 percent; on the next Malaysian Ringgit 50.00 per ton, the export duty is 25 percent; on the balance, the export duty is 30 percent.

2. Processed Palm Oil (PPO)

   The Export duty is based on the gazetted value of processed palm oil (PPO), whereby a duty is calculated in Malaysian Ringgit per ton according to the rates and categories. Category I is for processed palm oil (PPO) products which has undergone one stage process (such as neutralized/refined palm oil, bleached palm oil, crude palm olein). The export duty category I is 5 percent. Category II is processed palm oil (PPO)

products, which has undergone two processing stages (such as neutralized/refined bleached palm oil, neutralized/refined palm oil, bleached palm oil). The export duty for category II is 5 percent. Category III and IIIA are processed palm oil (PPO) products, which have undergone three processing stages (such as neutralized/refined bleached deodorized palm oil 6 red max, neutralized/refined bleached palm olein, neutralized/refined bleached deodorized palm oil 3 red max). The export duty for category III and IIIA is zero. Category IV is processed palm oil (PPO) products which have undergone the following four processing stages (such as neutralized/refined bleached deodorized palm olein). The export duty category IV is zero.

3. Palm Kernel (PK)

   Crude palm kernel oil (CPKO) has a 10 percent export duty. Refined bleached deodorized palm kernel oil (RBD palm kernel oil) has 5 percent export. Crude palm kernel olein has 5 percent export duty. Refined bleached deodorized palm kernel olein has no export duty. Crude/refined bleached deodorized palm kernel stearin has 5 percent export duty. Hydrogenated/refined bleached deodorized palm kernel olein, hydrogenated/refined bleached deodorized palm kernel stearin, and crude palm stearin have no export duty.

When the crisis started in June 1997, the exports of palm oil and palm kernel oil products (PO, PKO, and PKC) from Malaysia were not decreased, instead, the export of palm oil and palm kernel oil increased to 908,679 metric tons in September 1997 from 735,742 metric tons in June 1997 (Figure 4.4.). However, from October 1997 the palm oil and palm kernel oil export decreased to 639,614 metric tons in April 1998. There was

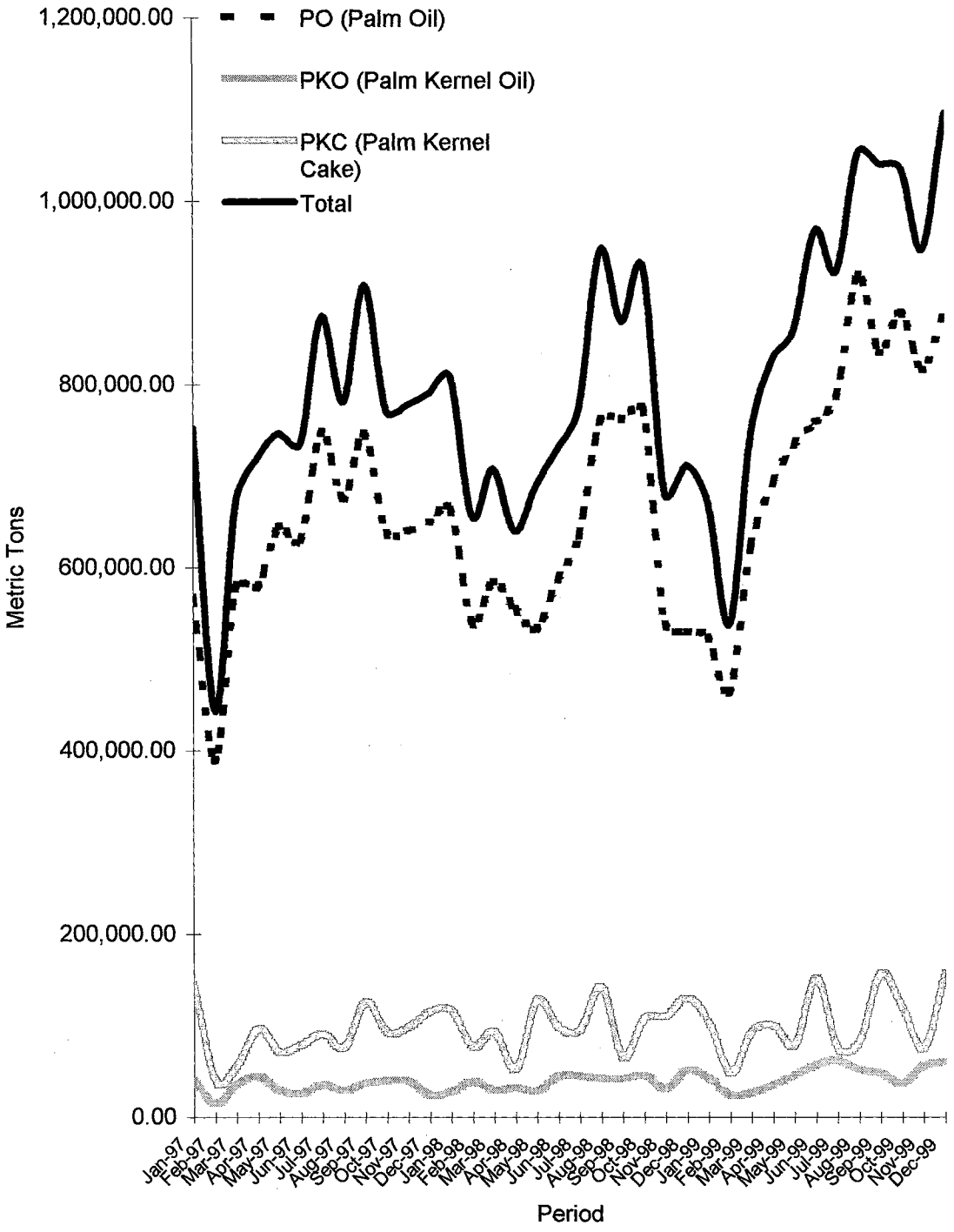


Figure 4.4. Palm Oil (PO), Palm Kernel Oil (PKO), and Palm Kernel Cake (PKC) Exports from Malaysia, January 1997 to December 1999

Source: Malaysian Palm Oil Board, 2000;
Palm Oil Registration and Licensing Authority, 1999

an increase in palm oil and palm kernel oil export since in May 1998 to 927,227 metric tons (October 1998). From November 1998 to February 1999, the Malaysian palm oil and palm kernel oil export decreased. In March 1999, palm oil and palm kernel oil exports increased to 1,054,087 metric tons.

Surprisingly the Asian financial crisis did not reduce the Malaysia's revenue from palm oil and palm kernel oil exports (Figure 4.5.). During the crisis from June 1997 to August 1998, Malaysia's foreign revenue from palm oil and palm kernel oil export had an increasing trend. The highest revenue was in August 1998 with a value of 2,094.90 million Malaysian Ringgit. From September 1998 to December 1999, the palm oil and palm kernel oil export revenue decreased but its revenue was still above the revenue before the crisis. Palm oil contributed to the largest revenue followed by palm kernel oil and palm kernel cake.

However, the crisis had an effect on domestic prices of palm oil and palm kernel oil products. During the crisis domestic prices of fresh fruit bunches (FFB), crude palm oil (CPO), palm kernel (PK), and crude palm kernel oil (CPKO) increased (Figures 4.6. and 4.7.). The increasing prices could have been caused by the weak of Malaysian Ringgit against US dollar, and policies of the Indonesian government like export restriction, export ban, and higher tariff rates, which triggered the shortage of supply of palm oil and palm kernel oil products in the world market.

In the crisis, Malaysian government did not apply policies on its palm oil and palm kernel oil industry, but Indonesian government applied some policies such as: 1) deregulation package (decrease the export tariff rates); 2) BULOG activities, and without

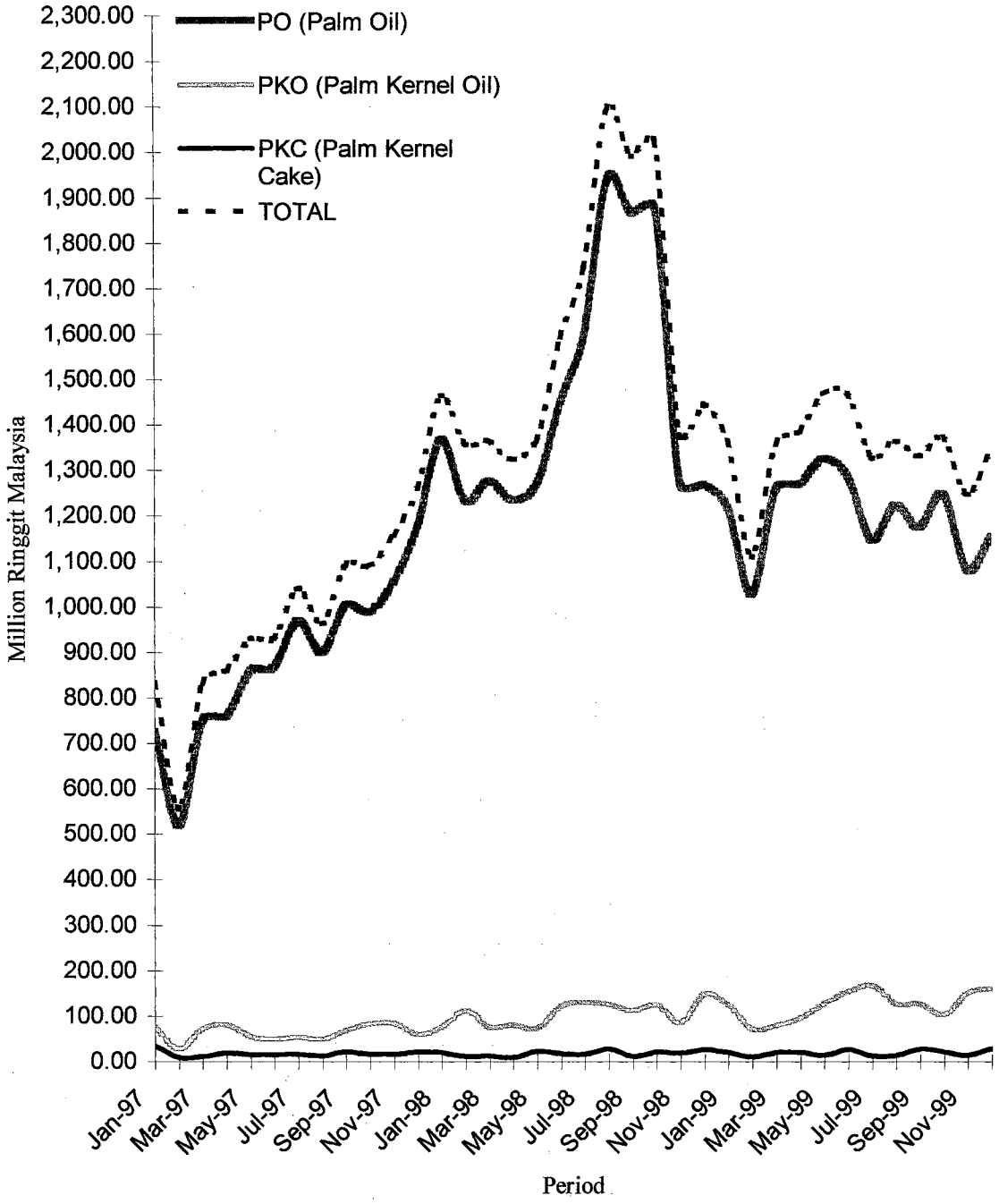


Figure 4.5. Values of Palm Oil (PO) Export, Palm Kernel Oil (PKO) Export, and Palm Kernel Cake (PKC) Export from Malaysia, January 1997 to December 1999

Source: Malaysian Palm Oil Board, 2000;
Palm Oil Registration and Licensing Authority, 1999

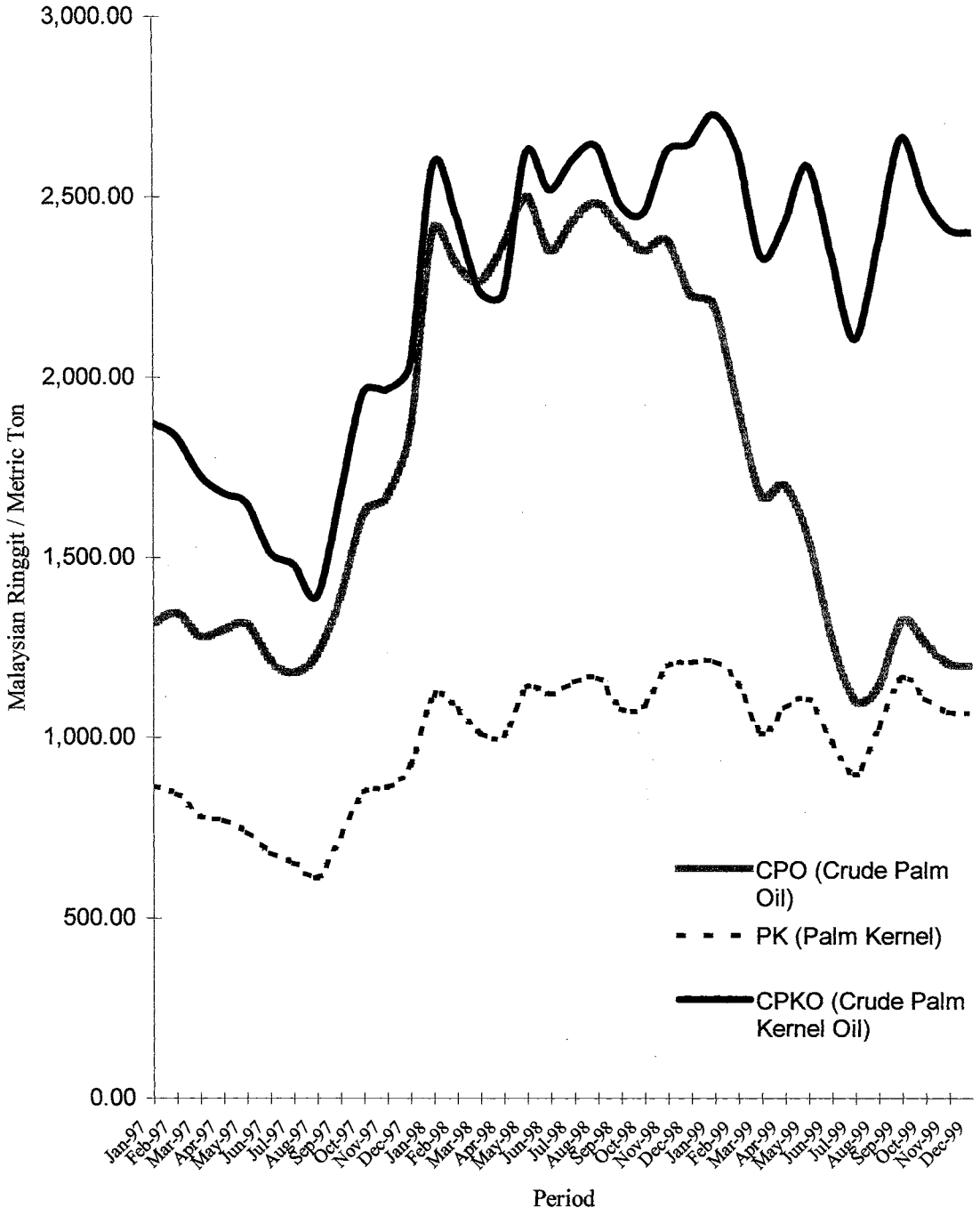


Figure 4.6. Average Domestic Prices of Crude Palm Oil (CPO), Palm Kernel (PK), and Palm Kernel Oil (PKO) in Malaysia, January 1997 to December 1999

Source: Malaysian Palm Oil Board, 2000
Palm Oil Registration and Licensing Authority, 1999

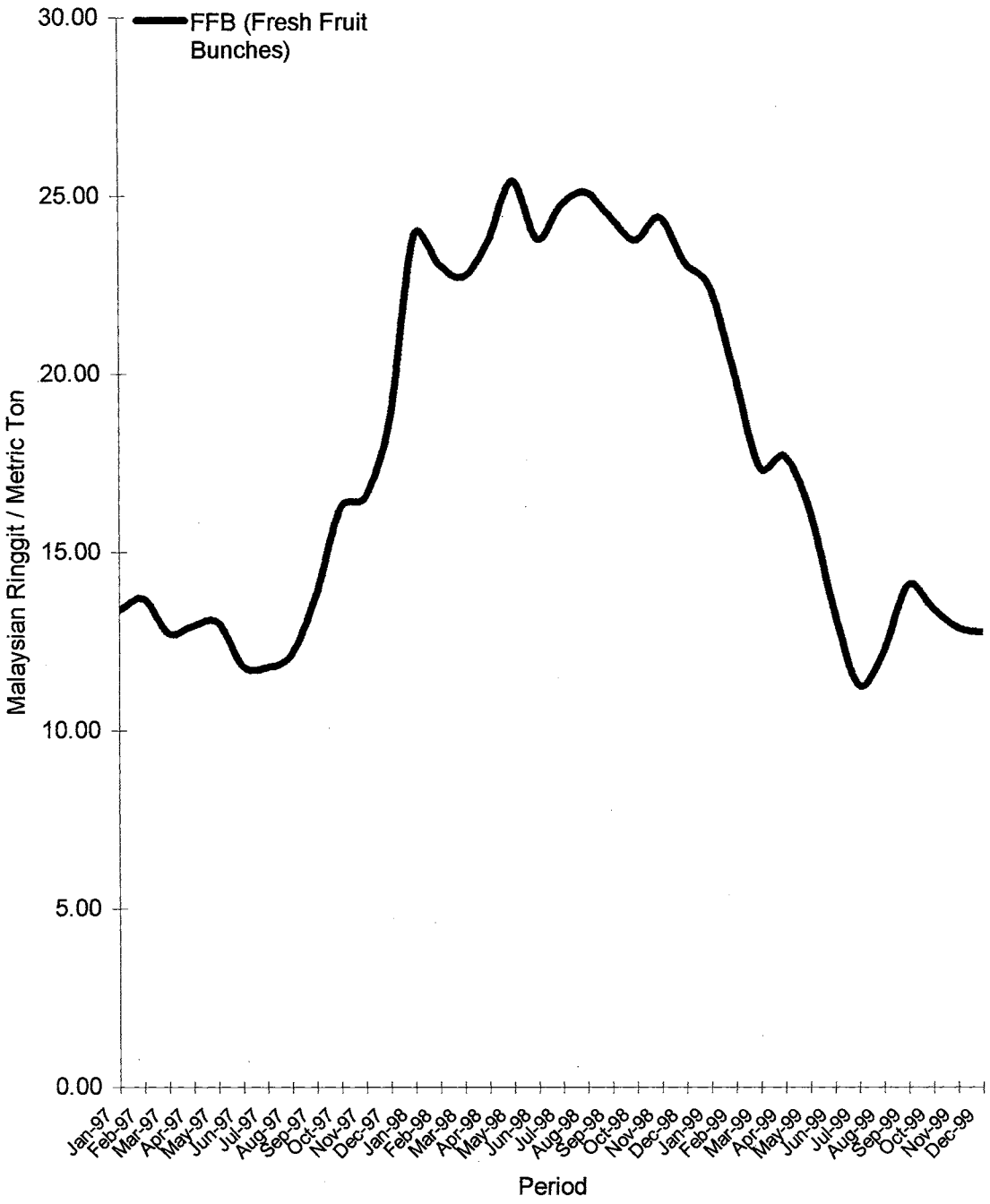


Figure 4.7. Average Domestic Prices of Fresh Fruit Bunches (FFB) in Malaysia, January 1997 to December 1999

Source: Malaysian Palm Oil Board, 2000;
Palm Oil Registration and Licensing Authority, 1999;
Palm Oil Registration and Licensing Authority, 1998

BULOG actions; and 3) export restriction such as export banned and higher export tariff rates.

# CHAPTER V

# THEORY AND PREVIOUS EMPIRICAL WORK

This chapter states the theory and previous empirical work used for this study. The theory and its hypotheses are in section 5.1. and 5.2. Previous empirical work is in section 5.3. The theory section is parted into three subsections, in subsection 5.1.1. International Trade, subsection 5.1.2. Taxes on Exports (Export Tariffs), and subsection 5.1.3. Depreciation of the Exporter Country's Currency. For each subsection a three panel diagram will be used. The theory section will lead to the empirical models. Summaries of previous research on exports, taxes and optimal export policies, and exchange rate are presented.

## 5.1. Theory

### 5.1.1. International Trade

International trade among countries happens when countries have differences in their comparative advantage and they want to obtain economies of scale in production (Krugman and Obstfeld, 1988). By using excess supply and excess demand, McCalla and Josling (1985) state the theory of international trade. McCalla and Josling (1985) describe the international trade theory with national supply and demand functions of two countries for a certain good, as in Figure 5.1. Suppose there are two countries,

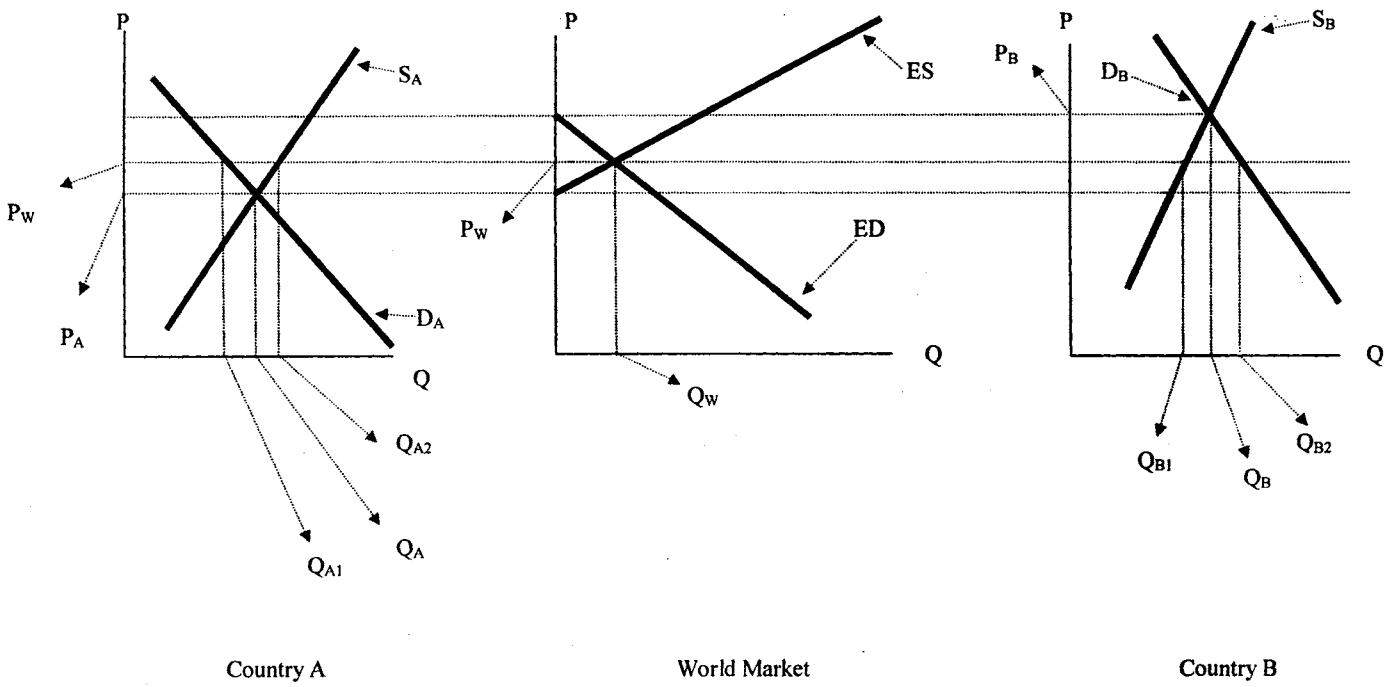


Figure 5.1. International Trade Three Panel Diagrams

Source: McCalla and Josling, 1985

Note:

$P$ = price of good i

$Q$ = quantity of good i

$P_W$ = the equilibrium world price of good i

$P_A$ = the equilibrium domestic price of good i in country A

$P_B$ = the equilibrium domestic price of good i in country B

$Q_W$ = the equilibrium world quantity of good i

$Q_A$ = the equilibrium domestic quantity of good i in country A

$Q_B$ = the equilibrium domestic quantity of good i in country B

$Q_{A1}$ = quantity demanded of good i in country A when the world price of good i is $P_W$

$Q_{A2}$ = quantity supplied of good i in country A when the world price of good i is $P_W$

ES = excess supply curve of good i

ED = excess demand curve of good i

$S_A$ = domestic supply curve of good i in country A

$D_A$ = domestic demand curve of good i in country A

$S_B$ = domestic supply curve of good i in country B

$D_B$ = domestic demand curve of good i in country B

$Q_{B2}$ = quantity demanded of good i in country B when the world price of good i is $P_W$

$Q_{B1}$ = quantity supplied of good i in country B when the world price of good i is $P_W$

country A and country B that produce good i. Assume: 1) single homogeneous commodity; 2) two-country world; 3) no government intervention; 4) and country A is a lower priced producer of good i and the country B is a higher priced producer of good i. When there is no trade for good i between these two countries, the domestic equilibrium price and quantity for country A are $P_A$ and $Q_A$, and for country B, $P_B$ and $Q_B$. For country A, when the price of good i is above $P_A$ then producers of good i in country A produce more good i than domestic consumers in country A would buy, there is excess supply of good i in country A. In country B, when the price of good i is below $P_B$ then the domestic consumer B would buy more good i than producer country B can produce, there is excess demand of good i in country B.

Suppose there is trade in good i between country A and B, with the assumption that transportation cost is zero. In the international market excess demand for good i equals excess supply for good i. The resulting equilibrium world price of good i is $P_W$ and the equilibrium quantity traded of good i is $Q_W$. For country A, $P_W$ is higher than $P_A$. Country A gains by exporting its product good i to the international market (world market). For country B, $P_W$ is less than $P_B$, and consumers in country B demand more of good i. Country B imports good i from the international market (world market). Country A will export good i $(Q_{A2} - Q_{A1})$ and country B will import good i $(Q_{B2} - Q_{B1})$ where $(Q_{A2} - Q_{A1}) = Q_W = (Q_{B2} - Q_{B1})$.

5.1.2. Taxes on Exports (Export Tariffs)

Taxes on export (export tariffs) are an export restriction levied on goods leaving the country (Patterson, 1989). Taxes on exports (export tariffs) result

in lower domestic prices and higher foreign prices. Production, consumption, and volume of exports also change (Weinblatt, 1985). Weinblatt (1985) stated that countries impose export restrictions such as taxes on exports (export tariffs) to ensure the continuity of domestic supply and to stabilize prices in domestic markets. Taxes on exports (export tariffs) cause a supply shock in exporter country, shift the export supply curve to the left and trigger the world price to increase and decrease the quantity traded (Figure 5.2).

Using the same assumptions and conditions in Figure 5.1., when exporter country (country A) applies export taxes (export tariffs) on good i, the $S_A$ excess supply curve of good i country A shifts to the left to $S_{A1}$ by the amount of the export tariff. World ES (Excess Supply) curve shifts to the left to ES1 curve. With the export taxes (export tariffs) in country A, excess supply shifts to the left to the ES1 curve and the world equilibrium price of good i increases from $P_W$ (world equilibrium price before the export taxes in country A) to $P_{W1}$ (world equilibrium price when the export taxes (export tariffs) applied in country A) and the world equilibrium quantity of good i decreases from $Q_W$ to $Q_{W1}$.

Along with world price $P_{W1}$, the export country (country A) produces $Q_{A3}$ of good i which $Q_{A4}$ is demanded by domestic country A. Export taxes (export tariffs) causes the export of good i (export good i) from country A to decrease from $(Q_{A2} - Q_{A1})$ to $(Q_{A3} - Q_{A4})$.

Ulbrich (1983) stated that numerous countries tax exports in order to deter the exports of specific goods for the benefit of domestic consumers. Countries tax their own

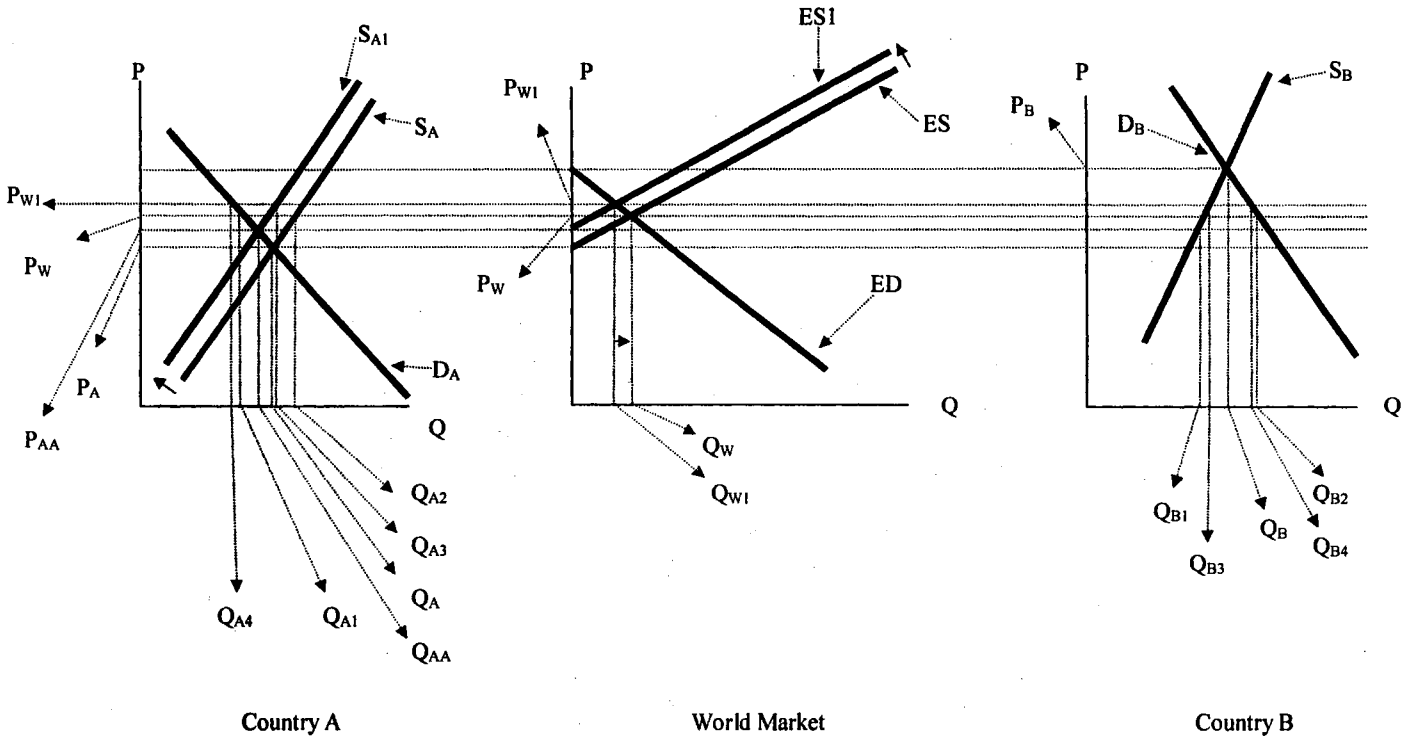


Figure 5.2. International Trade Three Panel Diagrams with Export Taxes (Export Tariffs)

Note:

$P$ = price of good i

$Q$ = quantity of good i

$P_W$ = the equilibrium world price of good i before export taxes applied in country A

$P_A$ = the equilibrium domestic price of good i in country A before export taxes applied in country A

$P_B$ = the equilibrium domestic price of good i in country B

$Q_W$ = the world equilibrium quantity of good i before export taxes applied in country A

$Q_{W1}$ = the world equilibrium quantity of good i with export taxes applied in country A

$Q_A$ = the equilibrium domestic quantity of good i in country A before export taxes applied in country A

$Q_B$ = the equilibrium domestic quantity of good i in country B

$Q_{A1}$ = quantity demanded of good i in country A when the world price of good i is $P_W$, before export taxes applied in country A

$Q_{A2}$ = quantity supplied of good i in country A when the world price of good i is $P_W$, before export taxes applied in country A

$Q_{A3}$ = quantity supplied of good i in country A when the world price of good i is $P_{W1}$, when export taxes applied in country A

$Q_{A4}$ = quantity demanded of good i in country A when the world price of good i is $P_{W1}$, when export taxes applied in country A

ES = excess supply curve of good i, before export taxes applied in country A

ES1 = excess supply curve of good i, when export taxes applied in country A

ED = excess demand curve of good i

$S_A$ = domestic supply curve of good i in country A, before export taxes applied in country A

$S_{A1}$ = domestic supply curve of good i in country A, when export taxes applied in country A

$D_A$ = domestic demand curve of good i in country A

$S_B$ = domestic supply curve of good i in country B

$D_B$ = domestic demand curve of good i in country B

$Q_{B2}$ = quantity demanded of good i in country B when the world price of good i is $P_{W,}$ before export taxes applied in country A

$Q_{B1}$ = quantity supplied of good i in country B when the world price of good i is $P_{W,}$ before taxes export applied

$Q_{B4}$ = quantity demanded of good i in country B when the world price of good i is $P_{W1,}$ when export taxes applied in country A

$Q_{B3}$ = quantity supplied of good i in country B when the world price of good i is $P_{W1,}$ when taxes export applied

exports for two basic reasons: 1) to keep the domestic price of a good low; and 2) to exploit power in a world market (international market) by using export taxes to raise the price foreign buyers pay for their exports which also generates domestic government income.

5.1.3. A Depreciation of the Exporter Country's Currency

When there is exchange rate instability in the markets the domestic and world markets will be influenced. Figure 5.3. explains the condition of markets for good i when there is depreciated currency of exporter country of good i. The assumptions are: 1) single-commodity market; 2) one country exporter and one country importer; 3) and good i trade in the world market is denominated in US dollar. Before the currency depreciation in exporter country A, the equilibriums world market of good i are $Q_W$ for quantity and $P_W$ for price which country A exports good i as ($Q_{A1} - Q_{A2}$). Currency depreciation in country A causes producers of good i in country A to become willing to supply more of good i to gain more profit in its domestic currency. Country A sells good i in the world market in obtaining US dollars. The exporter with depreciated currency (country A) indicates that in the world market good i from country A is more competitive and less expensive than before. $S_A$ curve in country A shifts to the right to $S_{A1}$, the excess supply curve ES (excess supply of good i) in the world market shifts to ES1. The equilibrium quantity increases from $Q_W$ to $Q_{W1}$, and price decreases from $P_W$ to $P_{W1}$. At $P_{W1}$ country A exports ($Q_{A3} - Q_{A4}$).

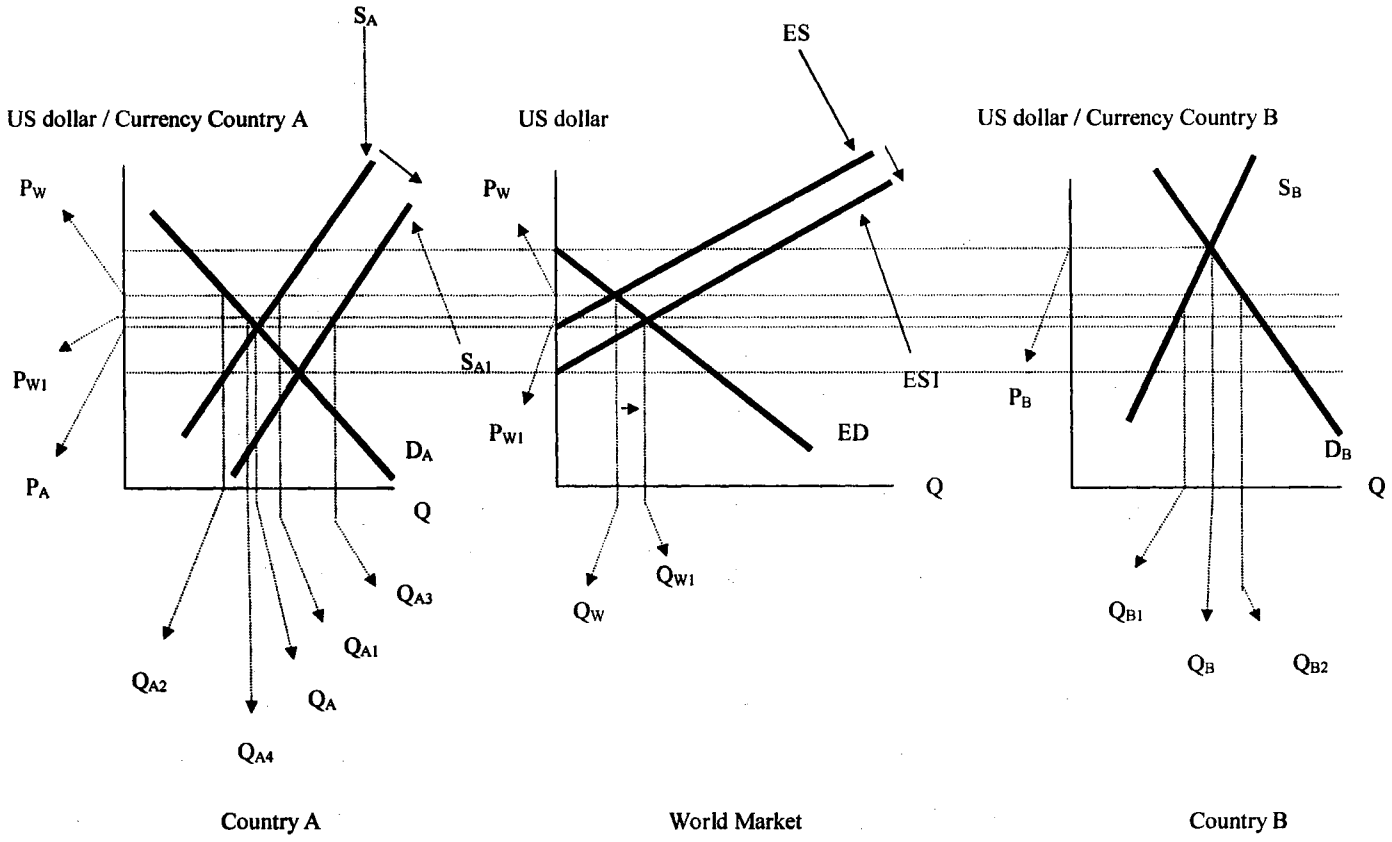


Figure 5.3. International Trade Three Panel Diagrams with Depreciating Currency of Its Export Country Currency Against US Dollar

Note:

$Q$ = quantity of good i

$P_W$ = the equilibrium world price of good i before depreciation currency in exporter country A

$P_A$ = the equilibrium domestic price of good i in country A before depreciation currency in exporter country A

$P_B$ = the equilibrium domestic price of good i in country B

$Q_W$ = the world equilibrium quantity of good i before depreciation currency in exporter country A

$Q_{W1}$ = the world equilibrium quantity of good i when there is depreciation currency in exporter country A

$Q_A$ = the equilibrium domestic quantity of good i in country A before depreciation currency in exporter country A

$Q_B$ = the equilibrium domestic quantity of good i in country B

$Q_{A1}$ = quantity supplied of good i in country A when the world price of good i is $P_W$, before depreciation currency in exporter country A

$Q_{A2}$ = quantity demanded of good i in country A when the world price of good i is $P_W$, before depreciation currency in exporter country A

$Q_{A3}$ = quantity supplied of good i in country A when the world price of good i is $P_{W1}$, when there is depreciation currency in exporter country A

$Q_{A4}$ = quantity demanded of good i in country A when the world price of good i is $P_{W1,}$ when there is depreciation currency in exporter country A

ES = excess supply curve of good i, before depreciation currency in exporter country A

ES1 = excess supply curve of good i, when there is depreciation currency in exporter country A

ED = excess demand curve of good i

$S_A$ = domestic supply curve of good i in country A, before depreciation currency in exporter country A

$S_{A1}$ = domestic supply curve of good i in country A, when there is depreciation currency in exporter country A

$D_A$ = domestic demand curve of good i in country A

$S_B$ = domestic supply curve of good i in country B

$D_B$ = domestic demand curve of good i in country B

$Q_{B1}$ = quantity supplied of good i in country B when the world price of good i is $P_W$

$Q_{B2}$ = quantity demanded of good i in country B when the world price of good i is $P_W$

## 5.2. The Theory's Hypotheses

The theory's hypotheses could be stated as follows: 1) producers in an exporting country will increase their production for exports as the world price of their products increases; 2) consumers of importer country would increase their import demand when the world price of import products are lower than their domestic prices; 3) excess demand would equal excess supply good in the world market; 4) an export tariff would be expected to increase world price, decrease the quantity traded in the international market, and decrease the domestic price; 5) currency depreciation of exporter country would increase exports of the product to the world market and would decrease the world price.

## 5.3. Previous Empirical Work

Numerous previous studies have examined international trade, the impact of currency fluctuations, and export tariffs.

### 5.3.1. Hudson and Ethridge (1999)

Hudson and Ethridge analyzed the effect of Pakistan's export tax on cotton and yarn areas. Pakistan applied an export tax on raw cotton from 1988 – 1995 in order to reduce the domestic price of cotton to the advantage of the domestic yarn industry. For cotton Hudson and Ethridge use a model: $d(P_c \times Y_c) = d\pi(1 + sr) + wdL_c + zdT$, where d is derivative, $P_c$ is the real price of cotton, $Y_c$ is the production of cotton fiber, $\pi$ is the real industry profit, s is some proportion, r represents the price of capital per unit time, w is the real wage, $L_c$ is the amount of labor used to produce cotton, z is the real cost of land, and T is the amount of land planted to cotton.

Hudson and Ethridge used another model for yarn. The model was:

$D(P_y \times Y_y) = d\pi (1 + sr) + wdL_y + CdP_c + P_c dC$, where d is derivative, $P_y$ is the real price of cotton yarn, $Y_y$ is the production of cotton yarn, $\pi$ is the real industry profit, s is some proportion, r represents the price of capital per unit of time, w is the real wage rate, $L_y$ is the amount of labor used to produce cotton yarn, C is the amount of cotton used in the production of cotton yarn, and $P_c$ is the real price of cotton.

Hudson and Ethridge found that: a) the export tax had a significant adverse effect on the cotton sector. The export taxation decreased growth in the cotton sector while it had little or no impact on the yarn sector; b) the export tax which may carry high social cost does not necessarily induce a growth in the processing sector; c) no own-price impact for cotton suggested that the cotton consumers did not respond to the cotton price; d) the export tax caused a decline in the cotton and yarn industries, it decelerated growth in the raw fiber sector; and e) the export tax on raw cotton had no beneficial effects on real total output in the yarn sector.

5.2.2. Repetto (1972)

Repetto studied optimal export taxes in the short and long run, and its application to Pakistan's jute export policy. Repetto used a simple formal analysis in showing the relevant parameters and their interaction to derive the formula for the optimum tax. The model that was applied:

$T^* = (1 / e_t) [(r + b) / b] = (1 / e_t) [1 + r / b] = (r + b) / e_s = (r + b) T^s$, where $T^*$ is the optimal tax can be estimated, $e_t$ is the long run demand elasticity, r is the discount factor to be interpreted as the social rate of time discount, b is a value between zero and one, $T^s$

is the tax that would be levied if only the short term demand elasticity were taken into consideration and all lagged demand response were ignored or treated as exogenous technological trend. Repetto found: a) the optimal tax depends on the long-run and short-run elasticities, the relationship between them, and on the social time discount rate, b) the optimum tax is higher, the higher the discount rate, the slower the demand response, and the lower the long run elasticity.

5.2.3. Yang and Hwang (1994)

Yang and Hwang studied the pricing behavior in Korean manufacturing. Two questions were studied: a) whether price behavior in the two markets (world market and domestic market) are definitely in the pass-through of exchange rate into export and domestic prices; and b) whether detected dissimilarity in the price behavior can be explained by the price discrimination hypothesis. Price equation models were used for the study:

$PD_{it} = \Sigma_j \alpha_{i1j} PF_{it-j} + \Sigma_j a_{i2j} PM_{i,t-j} + \Sigma_j a_{i3j} CY_{t-j} + a_{i0} + U_{it}$, and

$PX_{it} = \Sigma_j \alpha_{i1j} PF_{it-j} + \Sigma_j a_{i2j} PM_{i,t-j} + \Sigma_j a_{i3j} CY_{t-j} + a_{i0} + U_{it}$, where $PD_{it}$ is the change in the log of Korean domestic wholesale price for sector i less the unit labor in that sector, $PX_{it}$ is the change in the log of the Korean export price (in won) for sector i less the unit labor costs in that sector, $PF_{it}$ is the change in the log of the US wholesale price for sector i converted into the Korean currency won at the current spot exchange rate less the unit labor costs in that sector, $PM_{it}$ the change in the log of the import price of petroleum and related products less the unit labor costs in that sector, and $CY_{it}$ is the change in the log of Korean cyclical production (measured by the deviation from the log trend of industrial

production.

Six Korean manufacturing industries (textiles; woods and wood products; chemicals; nonmetallic minerals and mineral products; metals and metal products; machinery and equipments) from 1976 to 1990 were selected for the study. Monthly data on export prices, domestic prices, wages, competitor's prices, exchange rates, and imported materials prices from December 1976 to December 1990 were used for study. Ordinary least squares was used to estimate the models above. In getting the lagged effect, the polynomial distributed lag scheme with no endpoint restriction to each independent variable was used.

Yang and Hwang found that Korean manufacturing firms have followed a dual pricing strategy. For export prices, Korean manufacturing firms acted as price takers in the world market, selling at the competitive world price. Korean exporters absorved 70 % of a given change in foreign price and/or exchange rate in their margin on export sales and passed through the remaining 30 % within three months. Exchange rate changes were of little relevance in determining Korean manufacturing firms' relative prices in international markets. For domestic prices, changes in foreign prices and/or exchange rates did not affect the domestic prices but affected the raw material import prices.

5.2.4. Feinberg (1986)

Feinberg studied the effect of exchange rate movements on specific German industrial prices. Feinberg used seven years of data (1977 to 1983) for each 41 German industries with the model of log-linear equations:

i) $\ln RPPI_{ti} = a_0 + a_1 \ln GNP_t + a_2 \ln REXCH_t$

ii) $\ln RPPI_{ti} = a_0 + a_1 \ln GNP_t + a_2 \ln REXCH_t + a_3 \ln M_{ti} \ln REXCH_t +$

$a_4 \ln H_{ti} \ln REXCH_t$

iii) $\ln RPPI_{ti} = a_0 + a_1 \ln GNP_t + a_5 \ln SECTEXCH_{ti}$

iv) $\ln RPPI_{ti} = a_0 + a_1 \ln GNP_t + a_5 \ln SECTEXCH_{ti} +$

$a_6 \ln M_{ti} \ln SECTEXCH_{ti} + a_7 \ln H_{ti} \ln SECTEXCH_{ti}$

Where $RPPI_{ti}$ is relative producer prices for product i year t, $GNP_t$ is index of real GNP, $REXCH_t$ is index of real external value of the Deutsche Mark against the currencies of 14 industrialized countries, $M_{ti}$ is value of imports as a percentage of apparent domestic consumption, $H_{ti}$ is herfindahl index for industry i year t based on domestic firm shipments, $SECTEXCH_{ti}$ is industry sector specific movements in the real external value of the Deutsche Mark. The results suggest that an increase in the real value of the Deutsche Mark lowered the domestic prices of traded German goods.

5.2.5. Feinberg (1989)

Feinberg examined the relationship between currency-value fluctuations and domestic producer prices. Feinberg assumed: a) allow an oligopolistic structure in provision of the domestic good; b) the technology in the domestic good sector is captured by a fixed-coefficients linearly-homogeneous production function; and c) the pass through from exchange rates to import prices to be less than complete.

Feinberg used 14 years of data (1974 to 1987) for each of 84 US manufacturing industries on linear and log equation models:

i) $\ln RPPI_{ti} = a_{0i} + a_{1i} \ln GNP_t + a_{2i} \ln REXCH_{t-1}$, and

ii) $\ln RPPI_{ti} = a_{0i} + a_{1i} \ln GNP_t + f(X_i) \ln REXCH_t$

Where RPPI is a relative producer price, GNP is an index of real GNP, REXCH is an index of real multilateral trade-weighted value of dollar, and $f(X_i)$ is the estimated elasticity of domestic prices with respect to the exchange rate. Two-stage procedures were: 1) a simple model using industry intercept and slope dummy variables is applied to approximate an elasticity of response specific to each industry between the real exchange rate and relative producer prices using the pooled cross-section or time series data; and 2) a cross-section model is used to explain differences across industries in the estimated response elasticity by a series of industry variable.

Feinburg obtained the results: a) changes in the external value of the US dollar passed most fully into domestic prices of industries heavily reliant on imported inputs and producing goods highly substitutable for imports; and b) highly capital intensive and concentrated industries and those protected by extensive barriers to entry both for domestic and foreign sources have exhibited less domestic price change from the exchange rate movements.

5.2.6. Rana and Dowling (1985)

Rana and Dowling examined whether a small but continuous changes in effective exchange rates in nine Asian developing countries (India, Indonesia, Korea, Malaysia, Nepal, Philippines, Singapore, Taiwan, and Thailand) influenced their inflation rates. The model used time series data and is written as:

$P = a_0 + a_1 M + a_2 Y + a_3 P^f + a_4 WER$, where P is the rate of change of domestic prices, M is the rate of change of money supply, Y is the rate of change of real GDP, $P^f$ is the

change of the foreign price of imports, and WER is the rate of change of the import-weighted effective exchange rate. Granger-Sims type causality tests to investigate the assumption of the exogeneity of exchange rate changes to the domestic inflation rate were used before estimating the regression. Rana and Dowling found that exchange rate changes did not have a significant effect on inflation.

5.2.7. Kim (1991)

Kim studied the role of the exchange rate in US external adjustment. Seven endogenous variables in the linear and natural logarithm models were used on Vector Auto Regression (VAR) with three sets of data (US multilateral trade, US-Japan bilateral trade, and US-Germany bilateral). Kim found that the exchange rate is an important transmission channel of influence on price, and the exchange rate has strong effects on relative prices of traded goods.

5.2.8. Khan (2001)

Khan investigated the practice of agricultural taxation in developing countries in the perspective of the ongoing policy argument regarding the tax structure and administration influencing agricultural products. Khan also studied the conceptual and practical problems related with distinctive tax rules. Khan found that governments in most countries have trimmed down the export taxes on agricultural producers. Many governments have taxes to guard the domestic consumers and producers (stabilize prices for consumers and producers). Negative effects of the taxes include: a) reducing output and income of exports; and b) distorting resource distribution. Products such as tea,

coffee, cocoa, sugar, rice, soybean, palm oil, coconut oil, rubber, cotton, tobacco, fruits, and livestock have been target of export taxes.

# CHAPTER VI

# DATA, METHODOLOGY, AND EMPIRICAL RESULTS

The sources of data and empirical methods used for this research are described in this chapter. The impacts of the Asian financial crisis on the Indonesian, and Malaysian palm oil and palm kernel oil prices are estimated. In section 6.1. the data and study period are described. Section 6.2. shows effect of policies on Indonesian palm oil and palm kernel oil prices. Effect of Indonesian policies on Malaysian palm oil and palm kernel oil prices are explained in section 6.3. Section 6.4. describes the results.

## 6.1. Data and Study Period

Monthly data from January 1997 through December 1999 are used to estimate the parameters of the models. The data for Indonesian palm oil and palm kernel oil models are from Badan Pusat Statistik (Central Bureau Statistic) Jakarta, Indonesia. The data for Malaysian palm oil and palm kernel oil are from Palm Oil Registration and Licensing Authority (PORLA), and from Malaysian Palm Oil Board (MPOB). Both PORLA and MPOB are agencies under Ministry of Primary Industries of the Malaysian government.

## 6.2. Effects of Policies on Indonesian Palm Oil and Palm Kernel Oil Prices

The model for Indonesia has three equations which the left hand side variables

(endogenous variables) are export prices of Indonesian palm oil at current time t ($FOBPO_t$), export prices of Indonesian palm kernel oil at current time t ($FOBPKO_t$), and Indonesian domestic cooking oil prices at current time t ($DCOP_t$), Figure 6.1. Both ($FOBPO_t$) and ($FOBPKO_t$) include the tariff on exports. As previously noted, the Indonesian government used a variety of trade policy interventions in attempts to control cooking oil prices. Under pressure from the IMF, many of the policies were removed during the crisis period. The goal of the model is to determine the effect of the policies on palm oil, palm kernel oil, and cooking oil prices.

The models are expected to follow a partial adjustment process. Prices are not expected to adjust in one month because many of the prices for sales in the current month are negotiated one month in advance. In addition, learning the consequences of new information takes time and can involve delays.

The natural log of export prices of Indonesian palm oil is hypothesized to be related to the one period lagged world prices, quantity of exports, and the export ban policy. The model is a partial adjustment model. The independent variable in the model determines the fully desired, or adjusted, value of the dependent variable ($FOBPO_t^*$). That is

1) $ln\ FOBPO_t^* = \alpha_0 + \alpha_1\ ln\ WPPO_{t-1} + \alpha_2\ ln\ EPO_t + \alpha_3\ B_t + \varepsilon_t$

and only a portion $\nu$ of the total desired adjustment is made in one period:

2) $(ln\ FOBPO_t - ln\ FOBPO_{t-1}) = \nu\ (ln\ FOBPO_t^* - ln\ FOBPO_{t-1})$

where $0 < \nu < 1$, and $FOBPO_t$ is export price of Indonesian palm oil (US dollar per metric ton) at current time t, $WPPO_{t-1}$ is one period lagged of world prices of palm oil (US dollar per metric ton), $FOBPO_{t-1}$ is one period lagged export prices of Indonesian

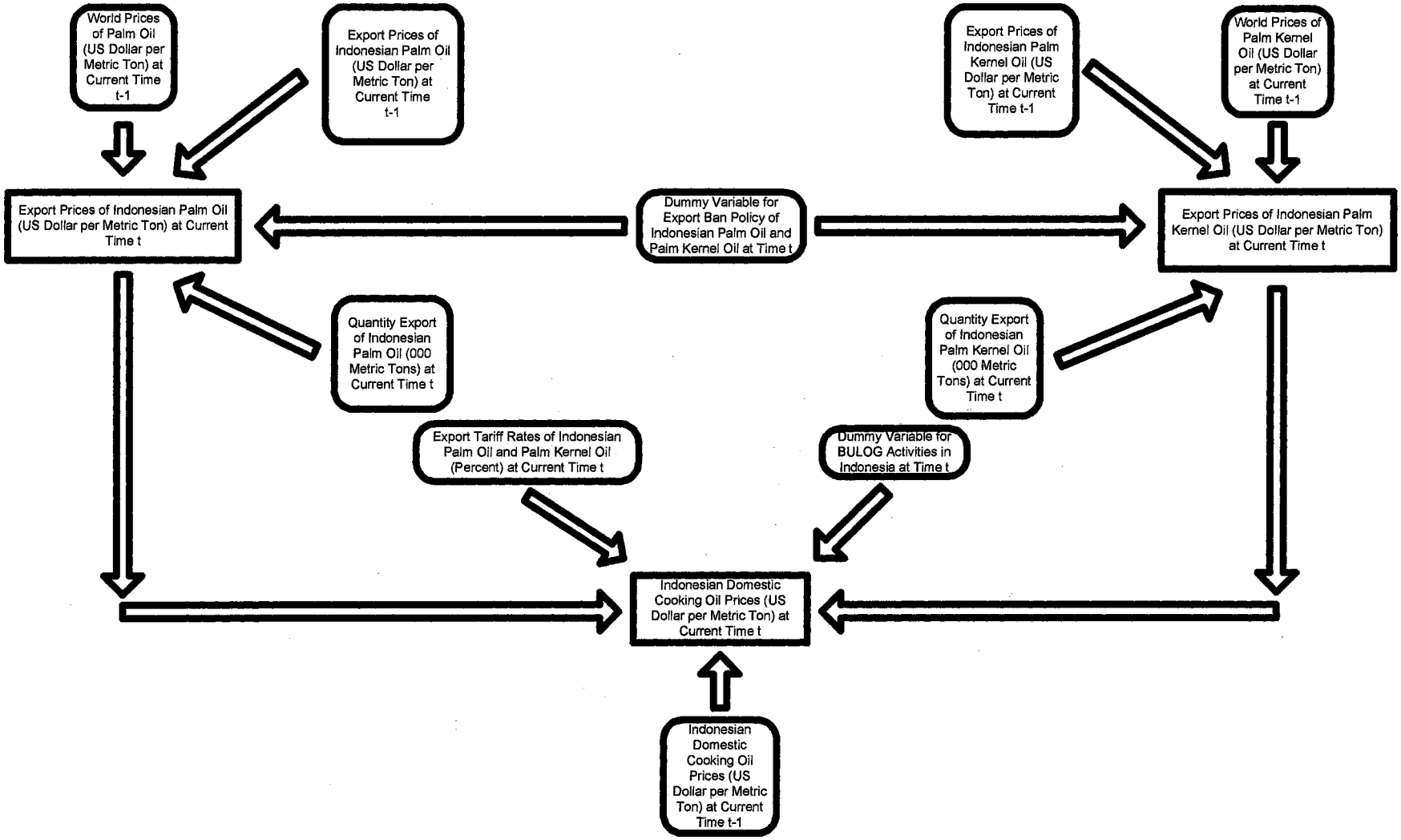


Figure 6.1. One System for Indonesian Model

Note:

= is endogenous variable

= is exogenous variable

palm oil (US dollar per metric ton), $EPO_t$ is quantity exported of Indonesian palm oil (000 metric tons) at current time t, $B_t$ is dummy variable for export ban policy of Indonesian palm oil and palm kernel oil at current time t (one for January 1998, February 1998, March 1998, and April 1998; zero otherwise), and $t$ is time. Solving the second equation for $ln\ FOBPO_t^*$, substituting into equation 1, and simplifying yields an equation that can be estimated as:

$ln\ FOBPO_t = \alpha_0\ v + \alpha_1\ v\ ln\ WPPO_{t-1} + (1-v)\ ln\ FOBPO_{t-1} + \alpha_2\ v\ ln\ EPO_t + \alpha_3\ v\ B_t + \varepsilon_t$. The coefficients that are estimated are the short run parameters ($\alpha_1\ v$, $\alpha_2\ v$, and $\alpha_3\ v$) and the long run parameters ($\alpha_0$, $\alpha_1$, $\alpha_2$, and $\alpha_3$) are calculated by dividing by $v$.

Export prices of Indonesian palm oil ($FOBPO_t$) are hypothesized to be positively related to the one period lagged world prices of palm oil ($WPPO_{t-1}$). That is, Indonesian prices are expected to follow world prices. Quantity exported in a given month is generally a function of commitments and negotiations made in prior months. Prices are hypothesized to be positively related to quantity of exports. As stated previously the export ban was not totally effective and exports continued. It is hypothesized that export prices of Indonesian palm oil in time t will be positively related to the dummy variable $B_t$ (Indonesian government policy to ban of exporting Indonesian palm oil and palm kernel oil in time t).

Similarly, the natural log of export price of Indonesian palm kernel oil is hypothesized to be related to one period lagged world prices, quantity exports, and the export ban. The equation is also assumed to follow a partial adjustment pattern. That is:

3) $ln\ FOBPKO_t^* = \beta_0 + \beta_1\ ln\ WPPKO_{t-1} + \beta_2\ ln\ EPKO_t + \beta_3\ B_t + \varepsilon_t$

4) $(ln\ FOBPKO_t - ln\ FOBPKO_{t-1}) = v\ (ln\ FOBPKO_t^* - ln\ FOBPKO_{t-1})$

where $0 < \nu < 1$, solving yields an equation that can be estimated as:

$ln\ FOBPKO_t = \beta_0\ \nu + \beta_1\ \nu\ ln\ WPPKO_{t-1} + (1-\nu)\ ln\ FOBPKO_{t-1} + \beta_2\ \nu\ ln\ EPKO_t + \beta_3\ \nu B_t + \varepsilon_t$, where $FOBPKO_t$ is export prices of Indonesian palm kernel oil (US dollar per metric ton), $WPPKO_{t-1}$ is one period lagged world prices of palm kernel oil (US dollar per metric ton), $FOBPKO_{t-1}$ is one period lagged export prices of Indonesian palm kernel oil (US dollar per metric ton), $EPKO_t$ is quantity export of Indonesian palm kernel oil (000 metric tons), $B_t$ is dummy variable for export ban policy of Indonesian palm oil and palm kernel oil (one for January 1998, February 1998, March 1998, and April 1998; zero otherwise), and $t$ is time.

It is hypothesized that export prices of Indonesian palm kernel oil at current time t ($FOBPKO_t$) are positively related to world prices of palm kernel oil lagged one period ($WPPKO_{t-1}$). It is hypothesized that export prices of Indonesian palm kernel oil follow world prices. Export prices of palm kernel oil are hypothesized to be positively related to quantity of Indonesian palm kernel oil exported ($EPKO_t$). Export prices of Indonesian palm kernel oil in time t are predicted to be positively related to dummy variable $B_t$ (Indonesian government policy to ban of exporting Indonesian palm oil and palm kernel oil in time t). Again, the ban was not fully effective and those exports that did occur were expected to be at higher price.

The last equation, natural log Indonesian domestic cooking oil prices are hypothesized to be related to palm oil and palm kernel oil export prices, the existence of BULOG intervention, and export tariff rates and is also hypothesized to follow a partial adjustment process. The model is:

5) $ln\ DCOP_t^* = \phi_0 + \phi_1\ ln\ FOBPO_t + \phi_2\ ln\ FOBPKO_t + \phi_3\ BUL_t + \phi_4\ ETR_t + \varepsilon_t$

6) $(\ln DCOP_t - \ln DCOP_{t-1}) = v(\ln DCOP_t^* - \ln DCOP_{t-1})$

where $0 < v < 1$. Solving yields an equation that can be estimated as:

$\ln DCOP_t = \theta_0 v + \theta_1 v \ln FOBPO_t + (1-v) \ln DCOP_{t-1} + \theta_2 v \ln FOBPKO_t + \theta_3 v BUL_t + \theta_4 v ETR_t + \varepsilon_t$, where $DCOP_t$ is Indonesian domestic cooking oil prices (US dollar per metric tons) at current time t, $DCOP_{t-1}$ is one period lagged Indonesian domestic cooking oil prices (US dollar per metric tons), $FOBPO_t$ is export prices of Indonesian palm oil (US dollar per metric ton) at current time t, $FOBPKO_t$ is export prices of Indonesian palm kernel oil (US dollar per metric ton) at current time t, $BUL_t$ is dummy variable for BULOG (National Logistic Agency) activities in Indonesia (one for January 1997, February 1997, March 1997, ... , May 1998, June 1998; zero otherwise), $ETR_t$ is export tariff rates of Indonesian palm oil and palm kernel oil (percent) at current time t, and $t$ is time.

Since $v$ is hypothesized to be less than one, the coefficient for lagged price is expected to be between zero and one. Indonesian domestic cooking oil prices ($DCOP_t$) are hypothesized to be positively related to export prices of Indonesian palm oil ($FOBPO_t$) and export prices of Indonesian palm kernel oil ($FOBPKO_t$). Domestic cooking oil is a blend of both palm oil and palm kernel oil. The presence of BULOG (National Logistic Agency) activities in Indonesian palm oil, Indonesian palm kernel oil, and Indonesian domestic cooking oil industries in time t ($BUL_t$) is hypothesized to affect Indonesian domestic cooking oil prices in time t, its effect would be negative relationship which means the BULOG would decrease the Indonesian domestic cooking oil prices. Indonesian domestic cooking oil prices are hypothesized to be negatively related to export tariff rates of Indonesian palm oil and palm kernel oil.

## 6.3. Effect of Indonesian Policies on Malaysian Palm Oil and Palm Kernel Oil

The model for Malaysian oil has six equations which the left hand side variables (endogenous variables) are Malaysian domestic prices of fresh fruit bunches ($PFFB_t$), Malaysian domestic prices of crude palm oil ($PCPO_t$), Malaysian domestic prices of palm kernel ($PPK_t$), Malaysian domestic prices of crude palm kernel oil ($PCPKO_t$), export prices of Malaysian palm oil ($FMPO_t$), and export prices of Malaysian palm kernel oil ($FMPKO_t$), Figure 6.2. The goal of the model is to determine the effect of Indonesian policies on Malaysian palm oil and palm kernel oil prices. The Malaysian equations are explained below.

In the first equation, natural log of the Malaysian domestic price of fresh fruit bunches (FFB) is hypothesized to be related to natural log of domestic prices the products of fresh fruit bunches (FFB). The equation is:

$$ln\ PFFB_t = \gamma_0 + \gamma_1\ ln\ PCPO_t + \gamma_2\ ln\ PPK_t + \gamma_3\ ln\ PCPKO_t + \varepsilon_t,$$

where $PFFB_t$ is Malaysian domestic prices of fresh fruit bunches (Malaysian Ringgit per metric ton), $PCPO_t$ is Malaysian domestic price of crude palm oil (Malaysian Ringgit per metric ton), $PPK_t$ is the Malaysian domestic price of palm kernel (Malaysian Ringgit per metric ton), $PCPKO_t$ is Malaysian domestic price of crude palm kernel oil (Malaysian Ringgit per metric ton), and $t$ is time.

Crude palm oil, palm kernel, and crude palm kernel oil are products from fresh fruit bunches thus it is hypothesized that Malaysian domestic prices of fresh fruit bunches in current time t (FFB) ($PFFB_t$) would have positive relationships with Malaysian domestic prices of crude palm oil ($PCPO_t$), palm kernel ($PPK_t$), and crude palm kernel oil ($PCPKO_t$) in time t.

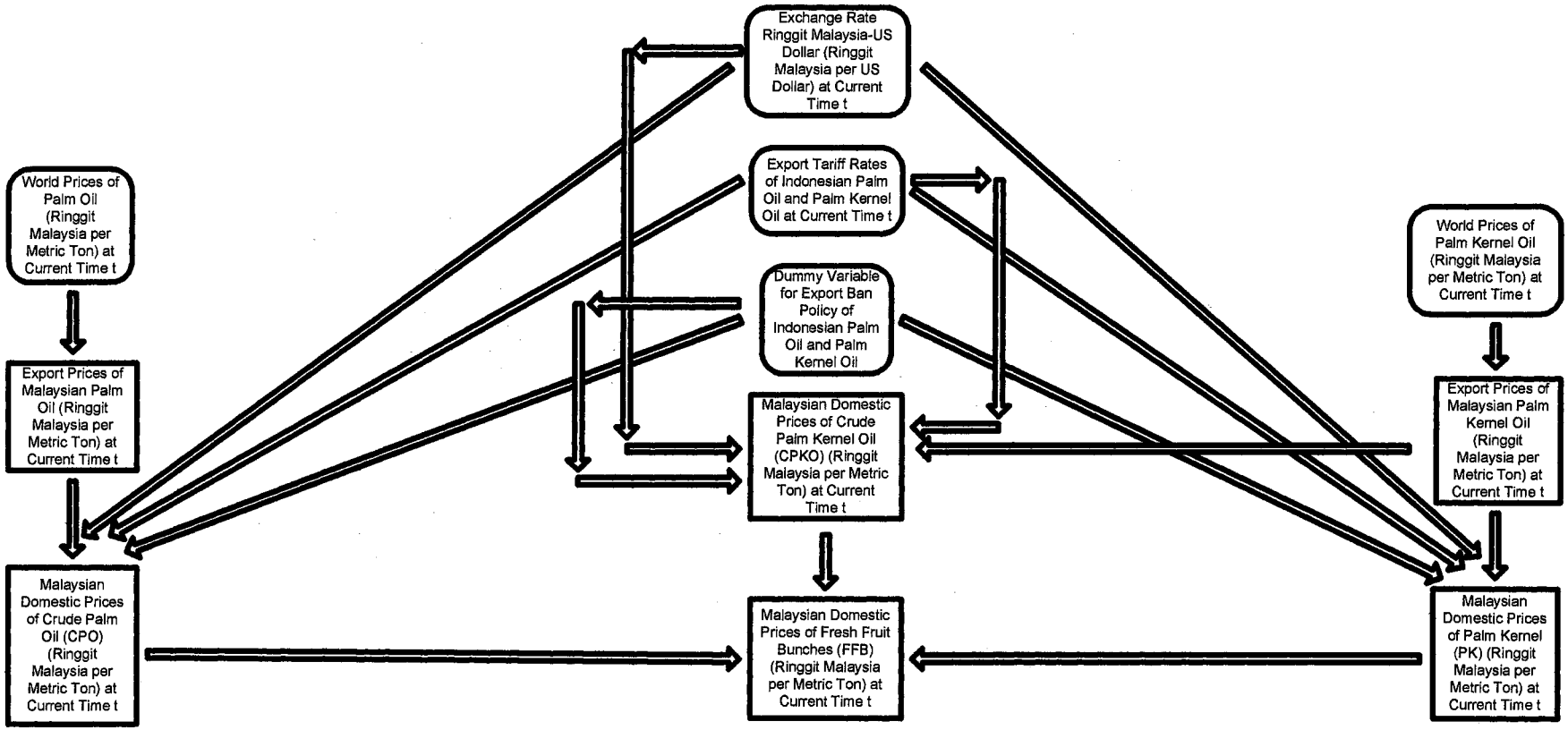


Figure 6.2. One System for Malaysian Model

Note:

= is endogenous variable

= is exogenous variable

In the second equation, natural log of the Malaysian domestic price of crude palm oil (CPO) is hypothesized to be related to natural log of the export price, exchange rate, and Indonesian policies. The equation is:

$$ln\ PCPO_t = \omega_0 + \omega_1\ ln\ FMPO_t + \omega_2\ ln\ EXCM_t + \omega_3\ ln\ ETR_t + \omega_4\ B_t + \varepsilon_t,$$

where $PCPO_t$ is Malaysian domestic price of crude palm oil (Malaysian Ringgit per metric ton), $FMPO_t$ is export price of Malaysian palm oil (Malaysian Ringgit per metric ton), $EXCM_t$ is exchange rate Malaysian Ringgit per US dollar, $ETR_t$ is export tariff rates of Indonesian palm oil and palm kernel oil (percent), $B_t$ is dummy variable for export ban policy of Indonesian palm oil and palm kernel oil (one for January 1998, February 1998, March 1998, and April 1998; zero otherwise), and t is time.

It is hypothesized the domestic price of crude palm oil is positively related to export prices of Malaysian palm oil ($FMPO_t$), the exchange rate ($EXCM_t$), export tariff rates of Indonesian palm oil and palm kernel oil ($ETR_t$), and dummy variable for export ban policy of Indonesian palm oil and palm kernel oil ($B_t$).

Similarly, in the third equation, natural log of Malaysian domestic prices of palm kernel is hypothesized to be positively related to natural log of export prices, exchange rate, and Indonesian policies. The equation is:

$$ln\ PPK_t = \rho_0 + \rho_1\ ln\ FMPKO_t + \rho_2\ ln\ EXCM_t + \rho_3\ ln\ ETR_t + \rho_4\ B_t + \varepsilon_t,$$

where $PPK_t$ is Malaysian domestic price of palm kernel (Malaysian Ringgit per metric ton), $FMPKO_t$ is export price of Malaysian palm kernel oil (Malaysian Ringgit per metric ton), $EXCM_t$ is exchange rate Malaysian Ringgit per US dollar, $ETR_t$ is export tariff rates of Indonesian palm oil and palm kernel oil (percent), $B_t$ is dummy variable for export ban

policy of Indonesian palm oil and palm kernel oil (one for January 1998, February 1998, March 1998, and April 1998; zero otherwise), and t is time.

It is hypothesized that Malaysian domestic price of palm kernel is positively related to the export price of Malaysian palm kernel oil ($FMPKO_t$), exchange rate Malaysian Ringgit-US dollar ($EXCM_t$), export tariff rates of Indonesian palm oil and palm kernel oil ($ETR_t$), and a dummy variable for export ban policy of Indonesian palm oil and palm kernel oil ($B_t$).

In the fourth equation, natural log of the Malaysian domestic price of crude palm kernel oil is hypothesized to be related to natural log of export prices, exchange rate, and Indonesian policies. The equation is:

$$ln\ PCPKO_t = \varphi_0 + \varphi_1\ ln\ FMPKO_t + \varphi_2\ ln\ EXCM_t + \varphi_3\ ln\ ETR_t + \varphi_4\ B_t + \varepsilon_t,$$

where $PCPKO_t$ is Malaysian domestic price of crude palm kernel oil (Malaysian Ringgit per metric ton), $FMPKO_t$ is export price of Malaysian palm kernel oil (Malaysian Ringgit per metric ton), $EXCM_t$ is exchange rate Malaysian Ringgit per US dollar, $ETR_t$ is export tariff rates of Indonesian palm oil and palm kernel oil (percent), $B_t$ is dummy variable for export ban policy of Indonesian palm oil and palm kernel oil (one for January 1998, February 1998, March 1998, and April 1998; zero otherwise), and t is time.

It is hypothesized that Malaysian domestic price of crude palm kernel oil is positively related to the export price of Malaysian palm kernel oil ($FMPKO_t$), exchange rate Malaysian Ringgit-US dollar ($EXCM_t$), export tariff rates of Indonesian palm oil and palm kernel oil ($ETR_t$), and a dummy variable for export ban policy of Indonesian palm oil and palm kernel oil ($B_t$).

In the fifth equation, natural log export prices of Malaysian palm oil are hypothesized to be related to the natural log of world prices. The equation is:

$ln\ FMPO_t = \eta_0 + \eta_1\ WPOM_t + \varepsilon_t,$

where $FMPO_t$ is export price of Malaysian palm oil (Malaysian Ringgit per metric ton), and $WPOM_t$ is world price of palm oil (Malaysian Ringgit per metric ton), and t is time.

It is hypothesized that export price of Malaysian palm oil is positively related to the world prices of palm oil ($WPOM_t$). An increase (a decrease) world prices of palm oil would increase (decrease) export prices of Malaysian palm oil.

In the sixth equation, natural log export prices of Malaysian palm kernel oil are hypothesized to be related to natural log world prices. The equation is:

$ln\ FMPKO_t = \kappa_0 + \kappa_1\ WPKOM_t + \varepsilon_t,$

where $FMPKO_t$ is export price of Malaysian palm kernel oil (Malaysian Ringgit per metric ton), and $WPKOM_t$ is world price of palm kernel oil (Malaysian Ringgit per metric ton), and t is time.

It is hypothesized that export price of Malaysian palm kernel oil is positively related to the world prices of palm kernel oil ($WPKOM_t$). An increase (a decrease) world prices of palm kernel oil would increase (decrease) export prices of Malaysian palm kernel oil.

## 6.4. Empirical Results

### 6.4.1. Indonesian Palm Oil and Palm Kernel Oil

The Indonesian model (three equations; Figure 6.1.) has 35 observations with ten exogenous variables (one period lagged world prices of palm oil in US dollar per metric

ton; one period lagged world prices of palm kernel oil in US dollar per metric ton; one period lagged export prices include to export tariff of Indonesian palm oil in US dollar per metric ton; one period lagged export prices include to export tariff of Indonesian palm kernel oil in US dollar per metric ton; dummy variable for export ban policy of Indonesian palm oil and palm kernel oil; quantity export of Indonesian palm oil in 000 metric tons in time t; quantity export of Indonesian palm kernel oil in 000 metric tons in time t; dummy variable for BULOG activities in Indonesia; one period lagged Indonesian domestic cooking oil prices in US dollar per metric ton, and export tariff rates of Indonesian palm oil and palm kernel oil in percent), and three endogenous variables (export prices include to export tariff of Indonesian palm oil in US dollar per metric ton in time t; export prices include to export tariff of Indonesian palm kernel oil in US dollar per metric ton in time t; and Indonesian domestic cooking oil prices in US dollar per metric ton in time t).

6.4.1.1. The System of Simultaneous Model

The results for the system are stated in Table 6.1. By choosing significance at P = 0.05 level and P = 0.01 level, the null hypothesis that all the coefficients of the variables in Indonesian simultaneous equation model are zero is rejected which the Chi-Square with 13 d.f. P-Value (or Wald test) is 0.000, and R-Square is 0.9700.

6.4.1.2. Equation 1: Export Prices of Indonesian Palm Oil

The results are stated in Table 6.2. In the short run and log run, the coefficients of one period lagged world prices of palm oil ($WPPO_{t-1}$) and one period lagged export

Table 6.1. The Results of System Indonesian Simultaneous Equation Model by Using Three-Stage Least Squares (3SLS)

| | |
|---|---|
| System R-Square | 0.9700 |
| Test of the Overall Significance | 122.68**[2] |
| Chi-Square with 13 d.f, P-Value | 0.000**[2] |

Note:

[1]One asterisk denotes significance at the five percent level

[2]Two asterisks denote significance at the one percent level

Table 6.2. Estimated Coefficients, Standard Errors, T-Ratios, and P-Values for Export Prices of Indonesian Palm Oil Equation

| Variable Name | Estimated Coefficient Short Run | Estimated Coefficient Long Run | Standard Error | T-Ratio | P-Value |
|---|---|---|---|---|---|
| INTERCEPT | -1.1927 | -2.0624 | 0.6323 | -1.8860 | 0.069 |
| ONE PERIOD LAGGED WORLD PRICES OF PALM OIL (US Dollar per Metric Ton) | 0.7007 | 1.2117 | 0.1389 | 5.0430[**2] | 0.000[**2] |
| ONE PERIOD LAGGED EXPORT PRICES OF INDONESIAN PALM OIL (US dollar per MetricTon) | 0.4217 | | 0.1230 | 3.4290[**2] | 0.002[**2] |
| QUANTITY EXPORT OF INDONESIAN PALM OIL (000 Metric Tons) | 0.0602 | 0.1041 | 0.0302 | 1.9910 | 0.056 |
| DUMMY VARIABLE FOR EXPORT BAN POLICY OF INDONESIAN PALM OIL AND PALM KERNEL OIL | -0.0022 | -0.0038 | 0.0671 | -0.0334 | 0.974 |
| R-SQUARE | 0.8790 | | | | |

Note:

Number observations are 35

$\nu$ (a portion of the total desired adjustment in one period) is 0.5783

[1]One asterisk denotes significance at the five percent level

[2]Two asterisks denote significance at the one percent level

prices of Indonesian palm oil ($FOBPO_{t-1}$) significantly influence export prices of Indonesian palm oil ($FOBPO_t$). The signs of coefficients are positive, consistent with the hypotheses. In the short run, an increase (a decrease) one percent of one period lagged export prices include to export tariff of Indonesian palm oil would cause an increase (a decrease) 0.4 percent of export prices of Indonesian palm oil, and an increase (a decrease) one percent of one period lagged world prices of palm oil would increase (decrease) 0.7 percent of export prices of Indonesian palm oil. In the long run, an increase (a decrease) of one percent of one period lagged world prices of palm oil would cause a 1.2 percent increase (decrease) in export prices of Indonesian palm oil. Quantity export of Indonesian palm oil ($EPO_t$) and dummy variable for export ban policy of Indonesian palm oil and palm kernel oil ($B_t$) are not significant.

6.4.1.3. Equation 2: Export Prices of Indonesian Palm Kernel Oil.

The results are stated in Table 6.3. In the short run and log run, the coefficients of one period lagged world prices of palm kernel oil ($WPPKO_{t-1}$) and one period lagged export prices of Indonesian palm kernel oil ($FOBPKO_{t-1}$) are significant and positive as hypothesized. In the short run, an increase (a decrease) of one percent of one period lagged export prices of Indonesian palm kernel oil would cause a 0.4 percent increase (decrease) in export prices of Indonesian palm kernel oil, and an increase (a decrease) one percent of one period lagged world prices of palm kernel oil would cause a 0.6 percent increase (decrease) in export prices of Indonesian palm kernel oil. In the long run, an increase (a decrease) one percent of one period lagged world prices of palm

Table 6.3. Estimated Coefficients, Standard Errors, T-Ratios, and P-Values for Export Prices of Indonesian Palm Kernel Oil Equation

| Variable Name | Estimated Coefficient Short Run | Estimated Coefficient Long Run | Standard Error | T-Ratio | P-Value |
|---|---|---|---|---|---|
| INTERCEPT | -0.0186 | -0.0303 | 1.3320 | -0.0140 | 0.989 |
| ONE PERIOD LAGGED WORLD PRICES OF PALM KERNEL OIL (US Dollar per Metric Ton) | 0.6126 | 0.9976 | 0.1833 | 3.3420[**2] | 0.002[**2] |
| ONE PERIOD LAGGED EXPORT PRICES OF INDONESIAN PALM KERNEL OIL (US dollar per Metric Ton) | 0.3859 | | 0.1408 | 2.7400[**2] | 0.010[**2] |
| QUANTITY EXPORT OF INDONESIAN PALM KERNEL OIL (000 Metric Tons) | -0.0197 | -0.0321 | 0.0238 | -0.8273 | 0.415 |
| DUMMY VARIABLE FOR EXPORT BAN POLICY OF INDONESIAN PALM OIL AND PALM KERNEL OIL | 0.0521 | 0.0848 | 0.0535 | 0.9734 | 0.338 |
| R-SQUARE | 0.4778 | | | | |

Note:

Number observations are 35

$\nu$ (a portion of the total desired adjustment in one period) is 0.6141

[1]One asterisk denotes significance at the five percent level

[2]Two asterisks denote significance at the one percent level

kernel oil would cause a 0.9 percent increase (decrease) in export prices of Indonesian palm kernel oil. Quantity export of Indonesian palm kernel oil ($EPKO_t$) and dummy variable for export ban policy of Indonesian palm oil and palm kernel oil ($B_t$) are not significant.

6.4.1.4. Equation 3: Indonesian Domestic Cooking Oil Prices

The results are stated in Table 6.4. In the short run and log run, the coefficients of export prices of Indonesian palm oil ($FOBPO_t$), dummy variable for BULOG activities in Indonesia ($BUL_t$), and export tariff rates of Indonesian palm oil and palm kernel oil ($ETR_t$) are significant. Consistent with the hypotheses the signs of coefficients are positive for export prices of Indonesian palm oil, and negative for dummy variable for BULOG activities in Indonesia and export tariff rates of Indonesian palm oil and palm kernel oil.

In the short run: 1) an increase (a decrease) of one percent of one period lagged export prices of Indonesian palm oil would cause an increase (a decrease) 0.5 percent of Indonesian domestic cooking oil price; 2) existence of BULOG activities decreased Indonesian domestic cooking oil price; and 3) an increase (a decrease) of one percent of export tariff rates of Indonesian palm oil and palm kernel oil would decrease (increase) of Indonesian domestic cooking oil price by 0.2 percent.

In the long run: 1) an increase (a decrease) one percent of one period lagged export prices include to export tariff of Indonesian palm oil would cause an increase (a decrease) Indonesian domestic cooking oil price by 0.8 percent; 2) existence of BULOG activities would decrease Indonesian domestic cooking oil price; and 3) an increase (a

Table 6.4. Estimated Coefficients, Standard Errors, T-Ratios, and P-Values for Indonesian Domestic Cooking Oil Prices Equation

| Variable Name | Estimated Coefficient Short Run | Estimated Coefficient Long Run | Standard Error | T-Ratio | P-Value |
|---|---|---|---|---|---|
| INTERCEPT | -4.6138 | -6.4828 | 2.8650 | -1.6100 | 0.118 |
| ONE PERIOD LAGGED INDONESIAN DOMESTIC COOKING OIL PRICES (US Dollar per Metric Ton) | 0.2883 | | 0.1889 | 1.5260 | 0.138 |
| EXPORT PRICES OF INDONESIAN PALM OIL (US dollar per Metric Ton) | 0.5344 | 0.7509 | 0.2513 | 2.1270[*1] | 0.042[*1] |
| EXPORT PRICES OF INDONESIAN PALM KERNEL OIL (US dollar per Metric Ton) | 0.8938 | 1.2559 | 0.4594 | 1.9450 | 0.061 |
| DUMMY VARIABLE FOR BULOG ACTIVITIES IN INDONESIA | -0.2274 | -0.3195 | 0.1029 | -2.2100[*1] | 0.035[*1] |
| EXPORT TARIFF RATES OF INDONESIAN PALM OIL AND PALM KERNEL OIL (Percent) | -0.2161 | -0.3036 | 0.0725 | -2.9820[**2] | 0.006[**2] |
| R-SQUARE | 0.5319 | | | | |

Note:

Number observations are 35

$\nu$ (a portion of the total desired adjustment in one period) is 0.7117

[1]One asterisk denotes significance at the five percent level

[2]Two asterisks denote significance at the one percent level

decrease) one percent of export tariff rates of Indonesian palm oil and palm kernel oil would decrease (increase) Indonesian domestic cooking oil price by 0.3 percent. One period lagged Indonesian domestic cooking oil prices ( $DCOP_{t-1}$) and export prices include to export tariff of Indonesian palm kernel oil ($FOBPKO_t$) are not significant.

6.4.2. Malaysian Palm Oil and Palm Kernel Oil

The Malaysian model (six equations; Figure 6.2.) has 35 observations with five exogenous variables (world prices of palm oil in Malaysian Ringgit per metric ton; exchange rate Malaysian Ringgit-US dollar; export tariff rates of Indonesian palm oil and palm kernel oil; dummy variable for export ban policy of Indonesian palm oil and palm kernel oil; and world prices of palm kernel oil in Malaysian Ringgit per metric ton) and six endogenous variables (export prices of Malaysian palm oil in Malaysian Ringgit per metric ton; Malaysian domestic prices of crude palm oil in Malaysian Ringgit per metric ton; Malaysian domestic prices of crude palm kernel oil in Malaysian Ringgit per metric ton; Malaysian domestic prices of fresh fruit bunches in Malaysian Ringgit per metric ton; export prices of Malaysian palm kernel oil in Malaysian Ringgit per metric ton; and Malaysian domestic prices of palm kernel in Malaysian Ringgit per metric ton).

6.4.2.1. The System of Simultaneous Model

The results for the system are stated in Table 6.5. By choosing at P = 0.05 level And P = 0.01 level, the null hypothesis that all the coefficients of the variables in Malaysia simultaneous equation model are zero is rejected which the Chi-Square with 12 d.f. P-Value (or Wald Test) is 0.000 and R-Square is 0.9999.

Table 6.5. The Results of System Malaysian Simultaneous Equation Model by Using Three-Stage Least Squares (3SLS)

| | |
|---|---|
| System R-Square | 0.9999 |
| Test of the Overall Significance | 317.43**[2] |
| Chi-Square with 17 d.f, P-Value | 0.000**[2] |

Note:

[1]One asterisk denotes significance at the five percent level

[2]Two asterisks denote significance at the one percent level

6.4.2.2. Equation 1:

The results for Malaysian domestic prices of fresh fruit bunches are stated in Table 6.6. The coefficient of Malaysian domestic prices of crude palm oil ($PCPO_t$) is significant. The sign of the coefficient is positive as hypothesized. An increase (a decrease) of one percent in Malaysian domestic prices of crude palm oil would cause a 0.9 percent increase (decrease) in Malaysian domestic prices of fresh fruit bunches. Malaysian domestic prices of palm kernel ($PPK_t$) and crude palm kernel oil ($PCPKO_t$) are not significant.

6.4.2.3. Equation 2:

The results for Malaysian domestic prices of crude palm oil are stated in Table 6.7. The coefficients of export prices of Malaysian palm oil ($FMPO_t$), exchange rate Malaysian Ringgit-US dollar ($EXCM_t$), and export tariff rates of Indonesian palm oil and palm kernel oil ($ETR_t$) are significant. The coefficient signs of export prices of Malaysian palm oil and export tariff rates of Indonesian palm oil and palm kernel oil are positive; their signs are the same signs as the hypotheses. The sign of exchange rate Malaysian Ringgit-US dollar is negative, this sign not consistent with the hypothesis.

An increase (a decrease) of one percent in export prices of Malaysian palm oil caused a 0.96 percent increase (decrease) in Malaysian domestic prices of crude palm oil. An increase (a decrease) of one percent in export tariff rates of Indonesian palm oil and palm kernel oil would cause a 0.03 percent an increase (a decrease) in Malaysian

Table 6.6. Estimated Coefficients, Standard Errors, T-Ratios, and P-Values for Malaysian Domestic Prices of Fresh Fruit Bunches (FFB) Equation

| Variable Name | Estimated Coefficient | Standard Error | T-Ratio | P-Value |
|---|---|---|---|---|
| INTERCEPT | -5.1224 | 0.0938 | -54.6100 | 0.000 |
| MALAYSIAN DOMESTIC PRICES OF CRUDE PALM OIL (CPO) (Malaysian Ringgit per Metric Ton) | 0.9238 | 0.0069 | 133.0000[**2] | 0.000[**2] |
| MALAYSIAN DOMESTIC PRICES OF PALM KERNEL (PK) (Malaysian Ringgit per Metric Ton) | 0.0619 | 0.1090 | 0.5676 | 0.574 |
| MALAYSIAN DOMESTIC PRICES OF CRUDE PALM KERNEL OIL (CPKO) (Malaysian Ringgit per Metric Ton) | 0.0879 | 0.1042 | 0.8435 | 0.405 |
| R-SQUARE | 0.9990 | | | |

Note:

Number observations are 36

[1]One asterisk denotes significance at the five percent level

[2]Two asterisks denote significance at the one percent level

Table 6.7. Estimated Coefficients, Standard Errors, T-Ratios, and P-Values for Malaysian Domestic Prices of Crude Palm Oil (CPO) Equation

| Variable Name | Estimated Coefficient | Standard Error | T-Ratio | P-Value |
|---|---|---|---|---|
| INTERCEPT | 0.5678 | 0.2115 | 2.6850 | 0.012 |
| EXPORT PRICES OF MALAYSIAN PALM OIL (Malaysian Ringgit per Metric Ton) | 0.9640 | 0.0287 | 33.6200[**2] | 0.000[**2] |
| EXCHANGE RATE RINGGIT MALAYSIA-US DOLLAR (Malaysian Ringgit per US Dollar) | -0.1180 | 0.0330 | -3.5790[**2] | 0.001[**2] |
| EXPORT TARIFF RATES OF INDONESIAN PALM OIL AND PALM KERNEL OIL (Percent) | 0.0397 | 0.0084 | 4.7360[**2] | 0.000[**2] |
| DUMMY VARIABLE FOR EXPORT BAN POLICY OF INDONESIAN PALM OIL AND PALM KERNEL OIL | 0.0256 | 0.0160 | 1.6000 | 0.120 |
| R-SQUARE | 0.9907 | | | |

Note:

Number observations are 36

[1]One asterisk denotes significance at the five percent level

[2]Two asterisks denote significance at the one percent level

domestic prices of crude palm oil. Dummy variable for export ban policy of Indonesian palm oil and palm kernel oil ($B_t$) is not significant but is positive as expected.

6.4.2.4. Equation 3:

The results for Malaysian domestic prices of palm kernel are stated in Table 6.8. The coefficient for export prices of Malaysian palm kernel oil ($FMPKO_t$) is significant and positive as hypothesized. An increase (a decrease) of one percent in export prices Malaysian palm kernel oil would cause a 1.2 percent an increase (a decrease) in Malaysian domestic prices of palm kernel. The exchange rate ($EXCM_t$) , export tariff rate for Indonesian palm oil and palm kernel oil ($ETR_t$) , and dummy variable for the export ban policy of Indonesian palm oil and palm kernel oil ($B_t$) are not significant.

6.4.2.5. Equation 4:

The results for Malaysian domestic prices of crude palm kernel oil are stated in Table 6.9. The coefficient of export prices of Malaysian palm kernel oil ($FMPKO_t$) is significant and positive as hypothesized. An increase (a decrease) of one percent of export prices of Malaysian palm kernel could cause a 1.3 percent an increase (a decrease) in Malaysian domestic prices of crude palm kernel oil. Exchange rate Malaysian Ringgit-US dollar ($EXCM_t$) , export tariff rates of Indonesian palm oil and palm kernel oil ($ETR_t$), and dummy variable for export ban policy of Indonesian palm oil and palm kernel oil ($B_t$) are not significant.

Table 6.8. Estimated Coefficients, Standard Errors, T-Ratios, and P-Values for Malaysian Domestic Prices of Palm Kernel (PK) Equation

| Variable Name | Estimated Coefficient | Standard Error | T-Ratio | P-Value |
|---|---|---|---|---|
| INTERCEPT | -2.5504 | 1.2140 | -2.1000 | 0.044 |
| EXPORT PRICES OF MALAYSIAN PALM KERNEL OIL (Malaysian Ringgit per Metric Ton) | 1.2494 | 0.1711 | 7.3040[**2] | 0.000[**2] |
| EXCHANGE RATE RINGGIT MALAYSIA-US DOLLAR (Malaysian Ringgit per US Dollar) | -0.2519 | 0.1335 | -1.8870 | 0.069 |
| EXPORT TARIFF RATES OF INDONESIAN PALM OIL AND PALM KERNEL OIL (Percent) | 0.0001 | 0.0178 | 0.0057 | 0.995 |
| DUMMY VARIABLE FOR EXPORT BAN POLICY OF INDONESIAN PALM OIL AND PALM KERNEL OIL | 0.0455 | 0.0279 | 1.6290 | 0.113 |
| R-SQUARE | 0.8330 | | | |

Note:

Number observations are 36

[1]One asterisk denotes significance at the five percent level

[2]Two asterisks denote significance at the one percent level

Table 6.9. Estimated Coefficients, Standard Errors, T-Ratios, and P-Values for Malaysian Domestic Prices of Crude Palm Kernel Oil (CPKO) Equation

| Variable Name | Estimated Coefficient | Standard Error | T-Ratio | P-Value |
|---|---|---|---|---|
| INTERCEPT | -1.9736 | 1.0990 | -1.7950 | 0.082 |
| EXPORT PRICES OF MALAYSIAN PALM KERNEL OIL (Malaysian Ringgit per Metric Ton) | 1.2635 | 0.1548 | 8.1650[**2] | 0.000[**2] |
| EXCHANGE RATE RINGGIT MALAYSIA-US DOLLAR (Malaysian Ringgit per US Dollar) | -0.1651 | 0.1206 | -1.3690 | 0.181 |
| EXPORT TARIFF RATES OF INDONESIAN PALM OIL AND PALM KERNEL OIL (Percent) | -0.0126 | 0.0161 | -0.7826 | 0.440 |
| DUMMY VARIABLE FOR EXPORT BAN POLICY OF INDONESIAN PALM OIL AND PALM KERNEL OIL | 0.0322 | 0.0249 | 1.2950 | 0.205 |
| R-SQUARE | 0.8552 | | | |

Note:

Number observations are 36

[1]One asterisk denotes significance at the five percent level

[2]Two asterisks denote significance at the one percent level

6.4.2.6. Equation 5:

The results for export prices of Malaysian palm oil are stated in Table 6.10. The coefficient of world prices of palm oil ($WPOM_t$) is significant and positive as hypothesized. An increase (a decrease) of one percent in the world price of palm oil would cause a 1.0 percent increase (decrease) in export prices of Malaysian palm oil.

6.4.2.7. Equation 6:

The results for export prices of Malaysian palm kernel oil are stated in Table 6.11. The coefficient of world prices of palm kernel oil ($WPKOM_t$) is significant and positive as hypothesized. An increase (a decrease) one percent world price of palm oil would cause a 0.9 percent increase (decrease) in export prices of Malaysian palm oil.

6.4.3. Summary of Empirical Results

From above explanations, it concludes that: 1) export prices of Indonesian palm oil and palm kernel oil follow the lagged world prices and the partial adjustment model appears appropriates; 2) export prices of Indonesian palm oil and palm kernel oil were not influenced by quantity exported; 3) export prices of Indonesian palm oil and palm kernel oil were not influenced by the export ban policy; 4) The Indonesian domestic cooking oil price was influenced by export price of palm oil, BULOG, and export tariff rate on palm oil and palm kernel oil; 5) Indonesian logistic agency, BULOG, effectively decreased domestic cooking oil prices; 6) increased Indonesian export tariff rates on palm oil and palm kernel oil decreased domestic cooking oil prices; and 7) Indonesian

Table 6.10. Estimated Coefficients, Standard Errors, T-Ratios, and P-Values for Export Prices of Malaysian Palm Oil Equation

| Variable Name | Estimated Coefficient | Standard Error | T-Ratio | P-Value |
|---|---|---|---|---|
| INTERCEPT | -0.4855 | 0.1195 | -4.0610 | 0.000 |
| WORLD PRICES OF PALM OIL (Malaysian Ringgit per Metric Ton) | 1.0395 | 0.0159 | 65.3900[**2] | 0.000[**2] |
| R-SQUARE | 0.9924 | | | |

Note:

Number observations are 36

[1]One asterisk denotes significance at the five percent level

[2]Two asterisks denote significance at the one percent level

Table 6.11. Estimated Coefficients, Standard Errors, T-Ratios, and P-Values for Export Prices of Malaysian Palm Kernel Oil Equation

| Variable Name | Estimated Coefficient | Standard Error | T-Ratio | P-Value |
|---|---|---|---|---|
| INTERCEPT | 1.0411 | 0.5054 | 2.0600 | 0.047 |
| WORLD PRICES OF PALM KERNEL OIL (Malaysian Ringgit per Metric Ton) | 0.8699 | 0.0651 | 13.3700[**2] | 0.000[**2] |
| R-SQUARE | 0.8216 | | | |

Note:

Number observations are 36

[1]One asterisk denotes significance at the five percent level

[2]Two asterisks denote significance at the one percent level

domestic cooking oil price was not influenced by its lagged price and export prices of palm kernel oil

For Malaysia, 1) the Malaysian domestic price of fresh fruit bunches was influenced by its domestic price of crude palm oil; 2) its domestic price of palm kernel and crude palm kernel oil did not influence the price of fresh fruit bunches; 3) Malaysian domestic prices of crude palm oil, palm kernel, and crude palm kernel oil were influenced by the export prices of palm oil and palm kernel oil; 4) exchange rate Malaysian Ringgit-US dollar only influenced domestic price of crude palm oil; 5) Indonesian export tariff rates palm oil and palm kernel oil influenced Malaysian domestic prices of crude palm oil; 6) the Indonesian export ban on palm oil and palm kernel oil did not influence Malaysian's palm oil and palm kernel oil domestic prices; and 7) Malaysian export prices of palm oil and palm kernel oil closely followed world prices.

# CHAPTER VII

# SUMMARY AND CONCLUSIONS

The 1997-1998 Asian financial crisis began in February 1997 in Thailand. The Thailand government was failed to peg the Baht (Thailand's currency) against US dollar. Baht was allowed to float freely against US dollar and decreased 20 percent. Baht's drop triggered and dispersed the financial crisis to Indonesia and Malaysia.

Social disruptions, decreases in output, decreases in income, massive job losses, and increased inflation were resulted. Increasing food prices became major issues. Palm oil is an important source for cooking oil in Indonesia and Malaysia. In Indonesia, palm oil is one of the nine essential commodities. Palm oil (cooking oil) became an important policy focus in Indonesia when its prices increased 80 to 134 percent in the crisis. The increasing price of cooking oil (palm oil) caused social turmoil and unrest in Indonesia. The Indonesian government set palm oil and palm kernel oil policies to stabilize and decrease the price of cooking oil. Export restrictions such as export ban and export tariffs for Indonesian palm oil and palm kernel oil were applied by the Indonesian government. In Malaysia, during the crisis the prices of its cooking oil were stable.

The objectives of this research are: 1) to describe the world palm oil and palm kernel oil industry from 1997 to 1999 and the condition of palm oil and palm kernel oil industry in Indonesia and Malaysia during, and after the 1997-1998 Asian financial crisis;

2) to describe the political and economic policies that were applied by the Indonesian and Malaysian government to handle the crisis particularly in their palm oil and palm kernel oil industry in 1997 to 1999; and 3) to determine the impact of 1997-1998 Asian financial crisis on palm oil and palm kernel oil industry in Indonesia and Malaysia by evaluating the effect of Indonesian palm oil and palm kernel oil policies on palm oil and palm kernel oil prices in Indonesia and Malaysia.

For objective one, I found that world palm oil and palm kernel oil production varied between 14,304,000 to 20,277,000 metric ton palm oil in 1994-1999, and between 1,861,000 to 2,518,000 metric tons for palm kernel oil. The world price of palm oil was from US $ 308.8 to US $ 723.8 per metric ton and from US $ 580.0 to US $ 780.0 per metric ton for palm kernel oil in 1994-1999. The world imports of palm oil increased from 10,614,000 to 13,581,000 metric tons in 1994-1999, while imports of palm kernel oil were from 896,000 to 1,260,000 metric tons. From 1994-1999, world export of palm oil increased from 10,760,000 to 13,527,000 metric tons , and world export palm kernel oil rose from 890,000 to 1,213,000 metric tons. 19,415,000 metric tons of world palm oil was disappearance in 1999 compare 14,803,000 metric tons in 1994 while the disappearance of world palm kernel oil increased from 1,946,000 to 2,554,000 metric tons.

Malaysia and Indonesia are the world's first and second largest producers and exporters of palm oil and palm kernel oil. In 1999, Malaysia produced 10,554,000 metric tons of palm oil, while Indonesia produced 6,060,000 metric tons. Combined, Malaysia and Indonesia produced 82 percent of the world palm oil in 1999. 8,802,000 metric tons

of palm oil was exported by Malaysia in 1999 which it was 83.4 percent of Malaysian production and Indonesia exported 52.5 percent of its production (3,183,000 metric tons).

In Indonesian domestic of cooking oil, palm oil accounts for 80 percent, coconut oil is 11 percents, palm kernel oil is 7 percent, soybean oil is 0.7 percent, and peanut oil is 0.2 percent. Private companies controlled 46.4 percent of the production area in Indonesia followed by government estates at 18.9 percent. Sumatra Island is the largest palm oil harvested area with 87.8 percentage share of production followed by Kalimantan, Sulawesi, Irian Jaya, and Java. In 1999, Indonesia exported 3,298,986.3 metric tons palm oil; 597,842.4 metric tons palm kernel oil in with values of US $ 1,114,242.6 for palm oil and US $ 347,974.6 for palm kernel oil.

In Malaysia, palm oil trees are located in the Peninsular Malaysia, Sabah, and Sarawak. In 1999 there were 3,313,393 hectares planted areas of palm oil trees compare 290,967 hectares in 1970. Private estates operated and managed 58.6 percent of palm oil area, 25.6 percent was by government organizations, 8.7 percent by smallholders and 7.1 percent by a state scheme in 1999. In 1999, Malaysia produced 10,553,918 metric tons of crude palm oil (CPO); 3,025,690 metric tons of palm kernel (PK); 1,338,905 metric tons crude palm kernel oil (CPKO); and 1,624,134 metric tons of palm kernel cake (PKC). Exports of Malaysian palm oil earned RM 16,142.90 million in 1999, which the major importers were India and Pakistan.

The 1997-1998 Asian financial crisis caused a dilemma for Indonesia. Indonesia's real gross domestic product (real GDP) shrank by 19 percent. Indonesian economic growth was five percent in 1997 and -13 percent in 1998. Indonesia's inflation was 5.25 percent in 1997, and 56.25 percent in 1998. Gross domestic product per capita

(GDP per capita) dropped from US $ 1,000.00 to US $ 450.00. The exchange rate moved from Rp 2,207.00 per US dollar in 1996 to Rp 14,900.00 per US dollar in 1998.

In completing objective 2, I found that Indonesia used numerous macroeconomic interventions as well policies directed toward the palm oil and palm kernel oil industry during the crisis while Malaysia did not. The Asian financial crisis started in Indonesia in July 1997. To cope with the crisis, the Indonesian government: a) reduced budget outlays by canceling or delaying projects; b) requested aid from the International Monetary Fund (IMF); c) closed down and merged unviable banks; d) dismantled domestic monopolies; e) broke up the government monopolies; f) reduced the interest of the ruling families and its cronies; g) allowed private sector participation in infrastructure development; h) expanded the privatization program; i) eliminated the cartels; and j) increased the transparency of public sector activities. In Indonesia there was great unrest. Shops and supermarkets that were owned by ethnic Chinese business were robbed and burned in some areas. As the riot was dispersed in Jakarta, 1,180 people died. The crisis caused Mr. Soeharto to resign as the president.

Malaysia also had economic and political problems during the 1997-1998 Asian financial crisis. Malaysia did not request a help from the International Monetary Fund (IMF) in handling the problems. In the year of the crisis Malaysian's economic growth of real gross domestic product (real GDP) was 7.5 percent in 1997, and it was -6.5 percent in 1998. Malaysian's inflation was 2.50 percent in 1997 and it was 5.50 percent in 1998. The Malaysian currency (Malaysian Ringgit) depreciated from RM 2.4832 to RM 4.5450 per US dollar. The Malaysian government dismissed Mr. Anwar Ibrahim as the deputy prime minister and finance minister of Malaysia. In handling the crisis, the

Malaysian government tried to reduce the government spending. Several large projects were delayed or cancelled by the government.

Because of the importance of palm oil and palm kernel oil for food security in Indonesia, the Indonesian government used several policy interventions during the crisis to control domestic cooking oil prices. The policies included: a) export tariffs; b) an export ban; c) government purchases and selling through BULOG (the National Logistic Agency); and d) activities of government production company PT Perkebunan Nusantara. The export tariff rates ranged from 2 to 60 percent. The export tariff on palm oil and palm kernel oil was established in September 1994. Indonesian policies moves during the 1997-1998 were frequent and included: a) prohibition of foreign investment in palm oil plantations; b) opening and developing new palm oil plantations in the eastern Indonesia; c) launching and expanding partnership of smallholders of palm oil in Eastern Indonesia; d) decreasing the export tariff rates of palm oil and palm kernel oil; e) applying the export restriction of palm oil and palm kernel oil by using quotas; f) increasing export tariff rates on palm oil and palm kernel oil; g) banning Indonesian palm oil and palm kernel oil for exports; g) allowing again foreign investment on palm oil plantations; h) prohibiting exports of some products of Indonesian palm oil and palm kernel oil; and i) stopping BULOG (the National Logistic Agency) distribution of palm oil and palm kernel oil from the government palm oil company PT Perkebunan Nusantara.

In Malaysia during the crisis 1997-1998, the Malaysian government did not change and/or apply any specific policies for its palm oil and palm kernel oil industry since Malaysia did not have a big problem with rapidly using domestic cooking oil

prices. The export, revenues, and its domestic prices of Malaysian palm oil and palm kernel oil increased during the crisis.

To meet objective 3, the impacts of the 1997-1998 Asian financial crisis on the Indonesian, and Malaysian palm oil and palm kernel oil industries were estimated using two systems of equations. The empirical results show that: 1) export prices of Indonesian palm oil and palm kernel oil follow the lagged world prices and the partial adjustment model appears appropriates; 2) export prices of Indonesian palm oil and palm kernel oil were not influenced by quantity exported; 3) export prices of Indonesian palm oil and palm kernel oil were not influenced by the export ban policy; 4) the Indonesian domestic cooking oil price was influenced by export price of palm oil, BULOG, and export tariff rate on palm oil and palm kernel oil; 5) Indonesian logistic agency, BULOG, effectively decreased domestic cooking oil prices; 6) increased Indonesian export tariff rates on palm oil and palm kernel oil decreased domestic cooking oil prices; and 7) Indonesian domestic cooking oil price was not influenced by its lagged price and export prices of palm kernel oil

For Malaysia, 1) the Malaysian domestic price of fresh fruit bunches was influenced by its domestic price of crude palm oil; 2) its domestic price of palm kernel and crude palm kernel oil did not influence the price of fresh fruit bunches; 3) Malaysian domestic prices of crude palm oil, palm kernel, and crude palm kernel oil were influenced by the export prices of palm oil and palm kernel oil; 4) exchange rate Malaysian Ringgit-US dollar only influenced domestic price of crude palm oil; 5) Indonesian export tariff rates palm oil and palm kernel oil influenced Malaysian domestic prices of crude palm oil; 6) the Indonesian export ban on palm oil and palm kernel oil did not influence

Malaysian's palm oil and palm kernel oil domestic prices; and 7) Malaysian export prices of palm oil and palm kernel oil closely followed world prices.

To summarize, from 1997 to 1999, world production of palm oil and palm kernel oil increased 7.4 percent per year, world imports of palm oil and palm kernel oil increased 7.4 percent per year, world exports of palm oil and palm kernel oil increased 7.2 percent per year, and the disappearance of world palm oil and palm kernel oil increased 5.3 percent per year. In Indonesia, during the crisis in 1998, production and exports of palm oil and palm kernel oil were the low compared to 1997 and 1999. However the number of oil palm plantations and palm oil area harvested increased. The Indonesian government used export tariff rates and BULOG agency for its palm oil and palm kernel oil to cope with the domestic crisis while the Malaysian government did not. In Indonesia the export tariff rate and BULOG were effective in reducing and stabilizing domestic cooking oil prices. For Malaysia, Indonesian export tariff rates and the export ban on Indonesian palm oil and palm kernel oil did not affect domestic prices of Malaysian palm oil and palm kernel oil.

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# APPENDIXES

Table A-1. Processed Palm Oil (PPO) Category

| Processed Palm Oil (PPO) Category |
|---|
| Crude Palm Olein |
| Crude Palm Stearin |
| Neutralised Palm Oil |
| Neutralised Palm Olein |
| Bleached Palm Oil |
| NB Palm Olein |
| NB Palm Oil |
| NBD Palm Oil |
| RBD Palm Oil |
| NBD Palm Stearin |
| RBD Palm Stearin |
| NBD Palm Olein |
| RBD Palm Olein |
| Palm Acid Oil |
| Palm Fatty Acid Distillate |
| Cooking Oil/Double Olein |
| RBD Hydrogenated Palm Oil |
| Hydrogenated Palm Fatty Acid |
| RBD Hydrogenated Palm Olein |
| Hydrogenated Palm Olein |
| RBD Hydrogenated Palm Stearin |
| Hydrogenated Palm Stearin |
| Hydrogenated Palm Oil |
| Hydrogenated Palm Fatty Acid Distillate |
| RBD Hydrogenated Stearin Flake |
| Refined Palm Oil |
| Distilled Palm Oil |

Source: Palm Oil Registration and Licensing Authority, 1999

Table A-2. Processed Palm Kernel Oil (PPKO) Category

| Processed Palm Kernel Oil (PPKO) Category |
|---|
| RBD Palm Kernel Oil |
| RBD Palm Kernel Olein |
| RBD Palm Kernel Stearin |
| RBDH Palm Kernel Oil |
| RBDH Palm Kernel Olein |
| RBDH Palm Kernel Stearin |
| NBDH Palm Kernel Olein |
| NBD Palm Kernel Stearin |
| NBD Palm Kernel Olein |
| NBD Palm Kernel Stearin |
| NB Palm Kernel Olein |
| NB Palm Kernel Stearin |
| N Palm Kernel Olein |
| Palm Kernel Fatty Acid |
| Palm Kernel Acid Oil |
| Hydrogenated Palm Kernel Oil |
| Hydrogenated Palm Kernel Olein |
| Hydrogenated Palm Kernel Stearin |
| Hydrogenated Palm Kernel Fatty Acid |
| Neutralised Palm Kernel Stearin |

Source: Palm Oil Registration and Licensing Authority, 1999

Table A-3. Export Volume and Value of Malaysian Palm Oil by Destination, 1998-1999

| Destination | 1998 | | 1999 | |
|---|---|---|---|---|
| | Volume (Metric Tons) | Value (RM Million) | Volume (Metric Tons) | Value (RM Million) |
| EU | 1,089,074 | 2,418.8 | 1,099,056 | 1,683.1 |
| EUROPE | 77,842 | 178.7 | 88,790 | 130.5 |
| N. AMERICA | 123,282 | 252.7 | 135,635 | 195.5 |
| LATIN AMERICA | 75,409 | 175.7 | 43,763 | 61.5 |
| MIDDLE EAST | 999,228 | 2,381.2 | 1,249,198 | 2,067.4 |
| AFRICA | 309,296 | 663.2 | 400,455 | 570.9 |
| OCEANIA | 110,447 | 251.3 | 101,810 | 180.4 |
| EAST ASIA | 1,546,434 | 3,751.6 | 1,507,395 | 2,511.5 |
| ASEAN | 423,516 | 988.5 | 605,067 | 1,008.0 |
| WEST ASIA | 2,698,871 | 6,556.5 | 3,653,111 | 5,929.9 |
| Bangladesh | 64,884 | 157.8 | 55,471 | 89.0 |
| Cambodia | 1,892 | 5.2 | 10,532 | 20.7 |
| India | 1,361,973 | 3,380.0 | 2,376,955 | 3,855.5 |
| Maldives | 16 | 0.0 | 0 | 0.0 |
| Myanmar | 203,638 | 506.9 | 139,800 | 235.5 |
| Nepal | 498 | 0.8 | 400 | 0.9 |
| Pakistan | 1,020,097 | 2,403.0 | 1,020,845 | 1,651.5 |
| Sri Lanka | 45,873 | 102.9 | 49,108 | 76.8 |
| OTHERS | 11,528 | 32.5 | 29,249 | 79.6 |
| TOTAL | 7,464,925 | 17,650.7 | 8,913,508 | 14,418.1 |

Source: Malaysian Palm Oil Board, 2000

Table A-4. Export Volume and Value of Malaysian Palm Kernel Oil by Destination, 1998-1999

| Destination | 1998 | | 1999 | |
|---|---|---|---|---|
| | Volume (Metric Tons) | Value (RM Million) | Volume (Metric Tons) | Value (RM Million) |
| EU | 128,858 | 352.0 | 148,273 | 394.2 |
| Austria | 78 | 0.2 | 0 | 0.0 |
| Belgium | 1,224 | 3.5 | 72 | 0.3 |
| Denmark | 15,745 | 46.5 | 18,626 | 54.4 |
| Finland | 0 | 0.0 | 297 | 1.1 |
| France | 20 | 0.9 | 154 | 0.5 |
| Germany | 0 | 0.0 | 2,754 | 5.8 |
| Greece | 980 | 3.2 | 1,850 | 5.8 |
| Ireland | 203 | 0.7 | 110 | 0.4 |
| Italy | 1,926 | 5.9 | 4,903 | 14.1 |
| Netherlands | 91,169 | 241.7 | 103,872 | 269.7 |
| Spain | 1,740 | 4.9 | 2,034 | 5.1 |
| Sweden | 5,113 | 16.5 | 3,909 | 12.4 |
| U. Kingdom | 10,661 | 27.8 | 9,693 | 24.6 |
| EUROPE | 1,954 | 6.1 | 7,505 | 22.1 |
| N. AMERICA | 95,116 | 272.7 | 125,274 | 336.5 |
| Canada | 1,070 | 2.8 | 1,256 | 2.9 |
| USA | 94,047 | 269.9 | 124,018 | 333.7 |
| LATIN AMERICA | 24,095 | 68.2 | 10,838 | 31.0 |
| MIDDLE EAST | 55,816 | 163.8 | 63,516 | 186.7 |
| AFRICA | 34,224 | 90.8 | 29,410 | 79.7 |
| OCEANIA | 7,116 | 20.9 | 8,910 | 27.1 |
| EAST ASIA | 72,900 | 197.8 | 93,749 | 253,7 |
| ASEAN | 6,311 | 15.8 | 31,203 | 82.6 |
| WEST ASIA | 32,052 | 69.5 | 24,362 | 59.3 |
| OTHERS | 4,018 | 12.2 | 6,854 | 21.2 |
| TOTAL | 462,459 | 1,269.8 | 549,893 | 1,494.1 |

Source: Malaysian Palm Oil Board, 2000

Table A-5. Export Volume and Value of Malaysian Palm Kernel Cake by Destination, 1998-1999

| Destination | 1998 | | 1999 | |
|---|---|---|---|---|
| | Volume (Metric Tons) | Value (RM Million) | Volume (Metric Tons) | Value (RM Million) |
| EU | 1,029,729 | 187.1 | 1,097,072 | 204.1 |
| Germany | 98,115 | 14.6 | 18,832 | 4.4 |
| Italy | 4,199 | 0.9 | 0 | 0.0 |
| Netherlands | 907,168 | 168.0 | 1,072,240 | 198.4 |
| Portugal | 5,882 | 1.0 | 0 | 0.0 |
| U. Kingdom | 14,365 | 2.7 | 6,000 | 1.2 |
| EAST ASIA | 187,272 | 31.1 | 140,420 | 25.1 |
| WEST ASIA | 0 | 0.0 | 16 | 0.0 |
| TOTAL | 1,217,001 | 218.2 | 1,245,493 | 230.7 |

Source: Malaysian Palm Oil Board, 2000

Table A-6. The Economic Growth of Indonesia 1995-1999

| Period | Economic Growth |
|---|---|
| | .....Percent..... |
| 1995 | |
| March | 8 |
| June | 7 |
| September | 9 |
| December | 9 |
| AVERAGE | 8.25 |
| 1996 | |
| March | 6 |
| June | 7 |
| September | 9 |
| December | 10 |
| AVERAGE | 8.00 |
| 1997 | |
| March | 8 |
| June | 7 |
| September | 3 |
| December | 2 |
| AVERAGE | 5.00 |
| 1998 | |
| March | -3 |
| June | -15 |
| September | -16 |
| December | -18 |
| AVERAGE | -13.00 |
| 1999 | |
| March | -8 |
| June | 3 |
| September | 1 |
| December | 6 |
| AVERAGE | 0.50 |

Source: Bank Indonesia

Table A-7. The Inflation Rate in Indonesia 1995-1999

| Period | Inflation Rate |
|---|---|
| | .....Percent..... |
| 1995 | |
| March | 3 |
| June | 2 |
| September | 1 |
| December | 2 |
| AVERAGE | 8.00 |
| 1996 | |
| March | 3 |
| June | 1 |
| September | 1 |
| December | 2 |
| AVERAGE | 1.75 |
| 1997 | |
| March | 2 |
| June | 3 |
| September | 5 |
| December | 11 |
| AVERAGE | 5.25 |
| 1998 | |
| March | 25 |
| June | 47 |
| September | 75 |
| December | 78 |
| AVERAGE | 56.25 |
| 1999 | |
| March | 4 |
| June | 3 |
| September | 0 |
| December | 2 |
| AVERAGE | 2.25 |

Source: Bank Indonesia

Table A-8. The Wholesale Price Index in Indonesia from 1996-1999

| Period | Wholesale Price Index (1993=100) |
|---|---|
| 1996 | |
| January | 252 |
| February | 253 |
| March | 254 |
| April | 256 |
| May | 256 |
| June | 258 |
| July | 258 |
| August | 258 |
| September | 261 |
| October | 264 |
| November | 265 |
| December | 267 |
| 1997 | |
| January | 270 |
| February | 268 |
| March | 266 |
| April | 265 |
| May | 265 |
| June | 264 |
| July | 266 |
| August | 273 |
| September | 286 |
| October | 307 |
| November | 309 |
| December | 341 |
| 1998 | |
| January | 452 |
| February | 487 |
| March | 505 |
| April | 495 |
| May | 546 |
| June | 611 |
| July | 660 |
| August | 641 |
| September | 642 |
| October | 610 |
| November | 593 |
| December | 579 |
| 1999 | |
| January | 607 |
| February | 613 |
| March | 625 |
| April | 638 |
| May | 632 |
| June | 623 |
| July | 301 |
| August | 311 |
| September | 324 |
| October | 317 |
| November | 311 |
| December | 319 |

Source: Bank Indonesia

Table A-9. The Exchange Rate of Indonesia, January 1995 – December 1999

| Month, Year | Exchange Rate (Rupiah / US $ 1.00) |
|---|---|
| 1995 | |
| January | 2,207 |
| February | 2,212 |
| March | 2,219 |
| April | 2,227 |
| May | 2,236 |
| June | 2,246 |
| July | 2,256 |
| August | 2,266 |
| September | 2,276 |
| October | 2,285 |
| November | 2,296 |
| December | 2,308 |
| 1996 | |
| January | 2,311 |
| February | 2,322 |
| March | 2,338 |
| April | 2,342 |
| May | 2,354 |
| June | 2,342 |
| July | 2,353 |
| August | 2,363 |
| September | 2,340 |
| October | 2,352 |
| November | 2,368 |
| December | 2,383 |

Table A-9. Continued

| Month, Year | Exchange Rate ( Rupiah / US $ 1.00 ) |
|---|---|
| 1997 | |
| January | 2,396 |
| February | 2,406 |
| March | 2,419 |
| April | 2,433 |
| May | 2,440 |
| June | 2,450 |
| July | 2,599 |
| August | 3,035 |
| September | 3,275 |
| October | 3,670 |
| November | 3,648 |
| December | 4,650 |
| 1998 | |
| January | 10,375 |
| February | 8,750 |
| March | 8,325 |
| April | 7,970 |
| May | 10,525 |
| June | 14,900 |
| July | 13,000 |
| August | 11,075 |
| September | 10,700 |
| October | 7,550 |
| November | 7,300 |
| December | 8,025 |

Table A-9. Continued

| Month, Year | Exchange Rate (Rupiah / US $ 1.00) |
|---|---|
| 1999 | |
| January | 8,950 |
| February | 8,730 |
| March | 8,685 |
| April | 8,260 |
| May | 8,105 |
| June | 6,726 |
| July | 6,875 |
| August | 7,565 |
| September | 8,386 |
| October | 6,900 |
| November | 7,425 |
| December | 7,100 |

Source: Badan Pusat Statistik

Table A-10. Unemployment with Education in Indonesia for 1997, 1998, and 1999.

| Educational Accomplishment | 1997 | 1998 | 1999 |
|---|---|---|---|
| | | .....People..... | |
| Under Primary School | 216,495 | 257,330 | 278,500 |
| Primary School | 760,172 | 911,782 | 1,151,252 |
| Junior High School | 763,375 | 984,104 | 1,159,478 |
| Senior High School | 2,106,182 | 2,479,739 | 2,886,216 |
| Diploma I/II | 37,676 | 47,380 | 90,230 |
| Academy/Diploma III | 104,054 | 128,037 | 153,696 |
| University | 236,352 | 254,111 | 310,947 |
| TOTAL | 4,197,306 | 5,062,783 | 6,030,319 |

Source: Badan Pusat Statistik, The BPS Web Site

Table A-11. The Economic Growth of Malaysia 1995-1999

| Period | Economic Growth |
|---|---|
| | .....Percent..... |
| 1995 | |
| March | 10 |
| June | 9 |
| September | 9 |
| December | 9 |
| AVERAGE | 9.25 |
| 1996 | |
| March | 8 |
| June | 8 |
| September | 8 |
| December | 8 |
| AVERAGE | 8.00 |
| 1997 | |
| March | 8 |
| June | 8 |
| September | 7 |
| December | 7 |
| AVERAGE | 7.50 |
| 1998 | |
| March | -2 |
| June | -7 |
| September | -9 |
| December | -8 |
| AVERAGE | -6.50 |
| 1999 | |
| March | -1 |
| June | 4 |
| September | 8 |
| December | 11 |
| AVERAGE | 5.50 |

Source: Bank Indonesia

Table A-12. The Inflation Rate in Malaysia 1996-1999

| Period | Inflation Rate |
|---|---|
| | .....Percent..... |
| 1996 | |
| March | 3 |
| June | 4 |
| September | 4 |
| December | 3 |
| AVERAGE | 3.50 |
| 1997 | |
| March | 3 |
| June | 2 |
| September | 2 |
| December | 3 |
| AVERAGE | 2.50 |
| 1998 | |
| March | 5 |
| June | 6 |
| September | 6 |
| December | 5 |
| AVERAGE | 5.50 |
| 1999 | |
| March | 3 |
| June | 2 |
| September | 2 |
| December | 3 |
| AVERAGE | 2.50 |

Source: Bank Indonesia

Table A-13. The Exchange Rate in Malaysia, 1995 -1999

| Month, Year | Exchange Rate ( RM / US $ 1.00 ) |
|---|---|
| 1995 | |
| January | 2.5572 |
| February | 2.5533 |
| March | 2.5353 |
| April | 2.4665 |
| May | 2.4683 |
| June | 2.4393 |
| July | 2.4584 |
| August | 2.4966 |
| September | 2.5072 |
| October | 2.5445 |
| November | 2.5425 |
| December | 2.5405 |
| 1996 | |
| January | 2.5615 |
| February | 2.5460 |
| March | 2.5368 |
| April | 2.4930 |
| May | 2.5001 |
| June | 2.4945 |
| July | 2.4935 |
| August | 2.4945 |
| September | 2.5070 |
| October | 2.5280 |
| November | 2.5270 |
| December | 2.5279 |

Table A-13. Continued

| Month, Year | Exchange Rate ( RM / US $ 1.00 ) |
|---|---|
| 1997 | |
| January | 2.4868 |
| February | 2.4832 |
| March | 2.4790 |
| April | 2.5110 |
| May | 2.5140 |
| June | 2.5235 |
| July | 2.6360 |
| August | 2.9620 |
| September | 3.1975 |
| October | 3.4370 |
| November | 3.5010 |
| December | 3.8883 |
| 1998 | |
| January | 4.5450 |
| February | 3.6750 |
| March | 3.6430 |
| April | 3.7365 |
| May | 3.8785 |
| June | 4.1750 |
| July | 4.1425 |
| August | 4.2200 |
| September | 3.8000 |
| October | 3.8000 |
| November | 3.8000 |
| December | 3.8000 |

Table A-13. Continued

| Month, Year | Exchange Rate (RM / US $ 1.00) |
|---|---|
| 1999 | |
| January | 3.8000 |
| February | 3.8000 |
| March | 3.8000 |
| April | 3.8000 |
| May | 3.8000 |
| June | 3.8000 |
| July | 3.8000 |
| August | 3.8000 |
| September | 3.8000 |
| October | 3.8000 |
| November | 3.8000 |
| December | 3.8000 |

Source: Bank Negara Malaysia

Table A-14. Export Duty on Palm Oil Products in Malaysia, January 1997 to December 1997

| Month | CPO | | PPO | | PPO Category | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | GP | Duty | GP | Duty | I | II | III | IIIA | IV |
| January | 1,297.63 | 169.29 | 1,320.06 | 176.02 | 38.16 | 30.06 | 26.01 | 21.96 | Nil |
| February | 1,236.32 | 150.89 | 1,348.46 | 184.53 | 32.99 | 24.04 | 19.57 | 15.09 | Nil |
| March | 1,236.32 | 150.89 | 1,376.19 | 192.85 | 34.25 | 24.46 | 19.57 | 14.68 | Nil |
| April | 1,426.83 | 208.05 | 1,433.50 | 210.05 | 58.33 | 46.83 | 21.07 | 15.33 | Nil |
| May | 1,325.00 | 177.50 | 1,425.01 | 207.50 | 46.87 | 35.62 | 10.00 | 4.38 | Nil |
| June | 1,277.50 | 163.25 | 1,437.90 | 211.37 | 41.34 | 29.71 | 23.89 | 18.07 | Nil |
| July | 1,333.82 | 180.15 | 1,424.62 | 207.38 | 47.77 | 36.53 | 30.91 | 25.29 | Nil |
| August | 1,285.50 | 165.65 | 1,414.98 | 204.49 | 41.83 | 30.88 | 25.40 | 19.94 | Nil |
| September | 1,250.00 | 155.00 | 1,352.98 | 185.89 | 34.63 | 25.55 | 21.00 | 16.46 | Nil |
| October | 1,274.50 | 162.35 | 1,383.60 | 195.08 | 38.59 | 28.58 | 23.58 | 18.57 | Nil |
| November | 1,274.50 | 162.35 | 1,514.85 | 234.46 | 49.67 | 35.72 | 28.75 | 21.78 | Nil |
| December | 1,381.20 | 194.36 | 1,627.55 | 268.26 | 71.01 | 53.68 | 45.02 | 36.36 | Nil |

Note:

CPO = crude palm oil

PPO = processed palm oil

GP = gazetted price

Source: Palm Oil Registration and Licensing Authority, 1998

# VITA

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