CHAPTER 3

OVERVIEW OF OIL INDUSTRY AND THE OIL FUND

Although this study attempts to analyze effects of the oil price shocks and the response of monetary policy on the Thai economy, Thailand has also a history of discretionary fiscal policy responding to oil price shocks. This chapter, then, describes the overview of the oil industry and the role of the Oil Fund in Thailand.

The oil industry in Thailand was formally regulated by the government during 1973-1990. After 1990, the Thai government abolished the regulation and the oil prices became competitive. However, in 2003-2005, oil prices were controlled again. We will explore in this chapter why the Thai government needed to regulate the oil industry, particularly the retail oil prices. From those periods, how retail oil prices were set, why the Oil Fund was established, and what its aim those will be determined

This chapter is divided into four sections. Firstly, the important role of oil on the Thai economy is presented. Secondly, the background of the Oil Fund is provided. Thirdly, Thailand's retail oil prices structure is provided. Finally, the consequences of the 2004 oil price subsidy scheme financed by the Oil Fund are, briefly, presented.

3.1 The Role of Oil on the Thai Economy

It is well known that the economy is heavily dependent on oil[1]. Oil is widely accepted as an important driver of economic growth. It is used economy-wide such as in the industry sector, transportation sector, agricultural sector, etc. Oil is either direct or indirect input in the production of goods in those sectors.

[1] Normally, *oil* means petroleum products which there are many types and the economy wide use of oil are gasoline or benzene, kerosene, diesel, fuel oil, and liquid petroleum gas (LPG), etc.

Thailand Oil Consumption

Historically, oil consumption accounts for a remarkable portion of Thailand's energy consumption, shown by Table 3.1 and Table 3.2. Table 3.1 shows the energy[2] consumption per GDP. Despite an economic slowdown in the middle of the 1990s, Thailand's energy consumption has increased over the past decade. The energy consumption per GDP ratio achieved double digit growth, around 16 percent. Despite the downward trend of the growth rate of GDP since 1996, the consumption of oil (petroleum products) as a share of GDP remains robust, accounting for a steady level at around 8-9% over the past decade.

Table 3.2 shows the final energy consumption by type of energy. We will see that the role of petroleum products, as a critical input in many production processes, is essential for the Thai economy. The consumption of petroleum products was the highest at around 50-57%, among other types of energy over the past decade. Table 3.3 will show the final energy consumption by economic sectors in Thailand. Among the economic sector, in 2002-2006, household/residential and transportation are the heaviest sector of the final energy. As we have stated that petroleum products play an essential role for driving economic growth, Table 3.4 stresses the role of petroleum products for economic sectors. Petroleum products are used more intensively in the transportation and industry sectors than others. Both sectors are widely accepted to be drivers of economic growth and development. In summary, oil has a crucial role for the Thai economy, in both household and industrial sector.

[2] Energy has a broader definition than oil. It means Coal and its products, Petroleum Products, Electricity, Natural Gas, and Renewable Energy.

Table 3.1

Energy Use and GDP

Unit:%

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
GDP Growth	5.0	-1.3	-10.5	4.4	4.8	2.1	5.3	7.1	6.3	4.5	5.0
Growth Rate of Final Energy Use	8.6	2.8	-9.0	3.9	0.8	3.4	7.3	6.1	9.7	2.3	0.6
Energy Use /GDP	15.6	16.3	16.6	16.5	15.9	16.1	16.4	16.2	16.7	16.4	15.7
Petroleum Products/GDP	9.1	9.4	9.5	9.3	8.9	8.9	8.9	8.8	9.0	8.5	7.9

Note: -GDP growth are calculated from GDP at constant 1988 price

-Energy Use /GDP are calculated from ktoe units of final energy use and a unit is ktoe/Million Baht, and Petroleum Products/GDP is calculated analogously. And ktoe = kilo ton of oil equivalent.

Source: Thailand Energy Situation, Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy. (www.dede.go.th)

Table 3.2

Final Energy Consumption by Type

Unit: %

Year	Coal and Its Products	Petroleum Products	Natural Gas	Electricity	Renewable Energy
1993	7.02	57.11	1.37	12.72	21.77
1994	8.14	57.82	1.48	13.20	19.35
1995	8.50	58.21	1.79	13.40	18.10
1996	9.50	58.21	1.75	13.70	16.84
1997	8.96	57.82	2.09	14.17	16.96
1998	7.68	57.47	2.14	15.42	17.29
1999	8.02	56.64	2.70	15.08	17.56
2000	6.11	55.94	3.81	16.13	18.01
2001	7.34	55.27	3.73	16.57	17.10
2002	7.82	54.57	4.03	16.51	17.08
2003	7.58	54.34	4.10	16.63	17.35
2004	8.33	54.39	4.34	16.13	16.81
2005	9.79	51.74	4.38	16.91	17.17
2006	10.17	50.18	4.67	17.61	17.37
2007	10.12	49.47	5.62	17.77	17.03

Source: Thailand Energy Situation

Table 3.3

Final Energy Consumption by Economic Sector

Unit: ktoe

Sector	2002	2003	2004	2005	2006
Agricultural	3,032	3,308	3,520	3,207	3,349
Residential	18,934	20,255	22,263	22,920	24,124
Commercial	7,909	8,173	8,801	8,933	9,035
Industry*	3,468	3,626	3,866	3,846	3,917
Transportation	19,636	20,927	22,812	23,491	22,755
Total	52,979	56,289	61,262	62,397	63,180

Note : Industry = Manufacturing + Mining + Construction

Source: Thailand Energy Situation

Table 3.4

Final Energy Consumption for Economic Sector in 2006

Unit: ktoe

Sector	Coal& Its Product	Petroleum Products	Natural Gas	Electricity	New & Renewable Energy	Total
Agricultural	-	3,327	-	22	-	3,349
Industry	7,660	3,811	1,970	5,113	5,570	24,124
Residential*	-	1,310	-	2,302	5,423	9,035
Commercial	-	463	-	3,454	-	3,917
Transportation	-	22,657	93	5	-	22,755
Total	7,660	31,568	2,063	10,896	10,993	63,180

Note: Industry = Manufacturing + Mining + Construction
Source: Thailand Energy Situation

High Oil-Importing Dependency Country

According to the energy consumption, approximately 90 percent of energy consumption is imported, as shown in Table3.5. Moreover, energy imports represent a significant percentage of the total import bill and GDP, as shown in Table 3.6. The ratios of energy imports to total imports and to GDP have increased continuously over the past decade. Even though the ratio of oil and crude oil imports to total energy imports have gradually decreased, they still take a high significant proportion, at

about 88% in 2006. Thailand being a developing country which would like to change from an agricultural society to an industrialized society will become increasingly dependent on oil.

Table 3.5

Proportion of Imported Energy Dependency

Year	Final Energy Consumption(ktoe)	Energy Imports (ktoe)	Dependency on Imported Energy (% of Final Energy Consumption)
2002	52,979	47,455	90
2003	56,289	51,316	91
2004	61,262	57,714	94
2005	62,397	57,333	92
2006	63,180	58,410	92

Source: Thailand Energy Situation

Table 3.6

Energy Imports

Units: Billion Baht

Items	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
GDP(current price)	4,611	4,733	4,626	4,637	4,923	5,134	5,451	5,917	6,490	7,088	7,816
Energy Import											
Crude Oil (1)	121.9	166.6	137.1	169.6	285.7	284.3	287.0	346.1	486.6	644.9	753.8
Oil (2)	33.3	15.9	7.0	12.9	36.8	28.5	25.8	30.7	41.5	55.7	60.3
Natural Gas					7.8	30.6	35.1	42.6	46.1	62.8	77.8
Coal	4.0	3.8	2.1	4.0	5.1	7.5	7.9	9.4	12.3	15.4	18.9
Electricity		0.7	2.5	3.4	4.7	4.7	4.5	4.2	5.7	7.1	8.3
Total (3)	159.2	187.0	148.7	189.9	340.3	355.6	360.2	433.0	592.2	786.0	919.1
(1+2) /(3) (%)	97.5	97.6	96.9	96.1	94.8	88.0	86.8	87.0	89.2	89.1	88.6
Energy Import/ Total Import (%)	8.7	9.7	8.4	10.0	13.6	12.9	13.0	13.8	15.6	16.5	18.9
Energy Import/ GDP (%)	3.5	4.0	3.2	4.1	6.9	6.9	6.6	7.3	9.1	11.1	11.8

Note: Energy Import/ GDP are calculated from GDP at current Price

Source : Thailand Energy Situation

Oil Price Shocks and Their Effects

With regards to oil prices, the fundamental determinant of oil prices is the demand and supply balance in the international market. On the demand side, the demand for oil is determined primarily by rates of economic growth of large countries in major regions of the world such as USA, China, India, etc., The supply side of the oil market is comprised of uncertainty output from OPEC (Organization of Petroleum Exporting Countries) and non-OPEC producing countries. In addition to these fundamental factors, the speculations on oil prices in the oil future markets have a role in determining the trend of oil prices.

As has been evidenced, the world has many experiences in oil price shocks, mostly from the supply side. Oil price shock, firstly, occurred in 1973-74 due to the Arab oil embargo. The next rounds of oil price shocks can be identified as the following; in 1978-79 due to Iranian revolution, in 1980 due to Iran-Iraq War, in 1990-91 due to Persian Gulf War, and recently in 2003 due to US-Iraq War (2003) and Civil unrest in Venezuela.

As long as oil prices remain high and unstable, the economic growth of Thailand as a high oil-importing dependent country will remain at risk. Therefore, the impacts of oil price shocks on Thailand's economy are strong and cannot be ignored.

Presumably, the world oil prices will affect the economy through inflationary pressures as the rising in oil prices will make it more costly for firms to produce goods and firms, consequently, will raise their products' prices. Therefore the consumer price index can be fluctuated by the hike in oil prices. Historically, in many countries the inflation rate measured by the growth rate of the consumer price index (CPI) was driven up substantially during the first oil price shock in 1973. In Thailand, CPI inflation increased from 4.9 percent in 1972 to 24.3 percent in 1974. The rise in the inflation rate implies a loss in real income. A lower level of in real income will delay the consumption of durables goods. As a result, investments will be contracted.

In addition, the oil price shocks will generate the second round effect when workers perceive their real income reduction and bargain to increase their nominal wage. This will associate wage-price spirals, which affects the inflation expectation.

As a result, the extent to which the impacts of higher oil prices have on an economy was either modified or exacerbated, both in the short term and in the long term.

The oil price shocks will slow down employment and lead to loss in economic growth. Because the Thai macroeconomic activity has been highly sensitive to oil and oil prices and as long as oil prices remain high and unstable, economic growth of Thailand as an oil-importing country will remain at risk. The policy responses, therefore, are required. In order to protecting the economy from undesirable effects driven by the world oil price shocks is the rationale that the Thai government needed to stabilize the domestic oil price and to manage the shortage of oil. As a result, the Oil Fund was established to be a tool of the Thai government for managing the oil market.

3.2 The Oil Fund

So far, we have seen how oil and oil prices matter for Thailand's economic growth. Therefore, the Thai government needs to regulate the oil industry for the stabilization of their prices since the government believed that guaranteed stable oil prices will decrease undesired economic fluctuations caused from inflationary pressure driven by world oil prices. The first regulation occurred in 1973. In this section, we present the background of the Oil Fund and its role.

A Brief History of Oil Fund

In the early 1970s, the world faced a sharp rise in oil prices. In accordance with high and significant relations between the world oil prices and Thailand's economy, the surges in world oil prices were of special concern to the Thai government. Therefore, in order to cope with the 1973-74 world oil prices crisis, the Royal Thai Government issued a decree namely the *Emergency Decree on Remedy and Prevention and Rectification of Shortage of Fuel Oil, B.E. 2516* (A.D.1973). This decree provided the Prime Minister with extensive authority in designating measures to solve and prevent the shortage of oil in case of emergency with no need to wait for responsible government agencies to take action pursuant to their respective governing

laws. As a result of this decree, the *Oil price Stabilizing Fund* was established on 19 September 1977 by the order of the Prime Minister in order to subsidize[3] for the Fuel Oil traders using the contribution from the oil refineries and importers. Next, on 29 December 1978, according to the Prime Minister's order, *Oil price Stabilizing Fund (Foreign Currency)* was established. It specified that oil importers had to send profits earned from baht depreciation to the Fund for use as subsidization when the crude oil prices increase. Finally the *Oil Fund*, again, by order of the Prime Minister, was established on 27 March 1979. The Oil Fund merged the former two Funds together.

Presently, the Oil Fund is managed by the Committee on Energy Policy Administration (CEPA)[4], appointed by the National Energy Policy Council. There are four major government agencies assisting the CEPA with the Oil Fund monitoring. The Energy Policy and Planning Office (EPPO) of the Ministry of Energy, being the Secretariat to the CEPA, is responsible for the issuance of CEPA's announcements on the contribution rates to be sent to the Oil Fund, the subsidy rates, oil and LPG pricing, and the transportation costs of LPG to regional depots and storage charges. The Customs Department, the Excise Department and the Energy Fund Administration Institute (EFAI) are responsible for the sending of contributions to and the payment of subsidies from the Oil Fund.

The Energy Fund Administration Institute (EFAI), a public organization, has recently been established under the Ministry of Energy. The prime objective of the EFAI is to procure funds to stabilize domestic retail oil prices. Besides, it is to perform other tasks in compliance with the government policies relevant to energy fund management. There is an Executive Director of EFAI responsible for the management of the institute and the establishment of operational regulations to achieve the specified objectives. According to the Ministerial Regulation on the

[3] The International Energy Agency (IEA) has defined energy subsidies as any government action that concerns primarily the energy sector that lowers the cost of energy production, raises the price received by energy producers or lowers the price paid by energy consumers. This definition can be used for oil subsidies in Thailand.

[4] CEPA was renamed from the Energy Policy Committee according to the bureaucratic reform of the Thai government in October 2002.

Deposit and Reimbursement of the Oil Fund, with the latest update on 31 December 2003, the Oil Fund account is monitored by the EFAI, which will report on the Oil Fund movement to the Ministry of Energy on a monthly basis.

The Role of the Oil Fund

According to the background of the establishment of the Oil Fund, we have seen that the Oil Fund's objective is to manage the oil industry in Thailand, particularly in domestic oil retail price management. The Oil Fund will control the ceiling prices of oil according to the government policy in order to maintain the retail prices of oil, in the event that the world oil prices are substantially high. This means, the Oil Fund will subsidize to the retailers when the world oil price is high. Oil prices are administered by the Oil Fund, which imposes various levies and taxes, and sets retail and wholesale prices, over-and-above an actual price. Additionally, the Oil Fund will impose tax on the oil suppliers when the government needs contributions for special purposes such as imposing high tax on benzene and diesel for subsidizing LPG for many years.

The Oil Fund's revenue comes from taxation, with in types of the oil fund rate and conservation fund rate, imposed on oil, i.e., benzene, kerosene, diesel, and fuel oil. Those are imposed to both on oil importers and domestic producers. Each oil type is levied at different rates according to its role and its impact on the economy. For example, benzene will be levied at a higher fund rate than diesel. The reason behind this is, presumably, diesel is primarily use for transportation and production fuel and has more both direct and indirect users than benzene, with diesel accounting for two-thirds of the total energy consumption.

Interestingly, the Oil Fund, since its establishment, has controlled the maximum level of the price of LPG as LPG is cooking gas and its price is highly sensitive for low income household's cost of living. Being concerned about the economy-wide impact of rises in the price of LPG, the Oil Fund has transferred funds to LPG retailers to subsidize the price of as we will see in the detail of the oil fund rate levied on each type of petroleum products in Table 3.7.

Table 3.7

Oil Fund Levied on Petroleum Products

Unit: Baht/Litre

Period	Benzene 95	Benzene 91	Gasohol	Kerosene	HSD (High Speed Diesel)	LSD (Low Speed Diesel)	LPG (Baht /KG.)
1999	0.09	0.09	-	0.10	0.10	0.08	(2.94)
2000	0.34	0.22	-	0.10	0.10	0.11	(7.31)
2001	0.50	0.30	-	0.10	0.50	0.50	(5.55)
2002	0.50	0.30	0.27	0.10	0.50	0.50	(2.72)
2003	0.49	0.30	0.27	0.10	0.44	0.50	(3.05)
2004	(0.34)	(0.59)	0.24	0.10	(2.24)	(2.27)	(2.55)
2005	1.28	1.03	0.13	0.10	(0.92)	(1.02)	(2.54)
2006	2.70	2.50	0.84	0.10	1.47	1.47	(1.93)
2007	3.46	3.26	1.25	0.10	1.50	1.50	(1.46)

Source: Energy Policy and Planning Office Ministry of Energy, Thailand

Although the Oil Fund was a tool for stabilizing domestic oil retail prices for the Thai government for many years, between 1977-1990, the Oil Fund's role decreased during the period that the Thai government tried to deregulate the oil industry in 1991. After the end of the Gulf-war in 1991, the world crude oil prices entered a steady decline until 1994. Consequently, the Thai government used this opportunity to deregulate the wholesale and retail prices of benzene, kerosene, diesel and fuel oil. The deregulations were implemented on 19 August 1991. Those prices were freely adjusted according to the market mechanism, but LPG is the only type that still is regulated because the price of LPG price has considerable impact on the economy, as discussed above. During the deregulation of oil, the Oil Fund has been used mainly as a source of subsidizing the LPG price.

The international oil prices have been excessively high due to the US-Iraq crisis since in early 2003. The West Texas Intermediate (a reference price used in the United States and globally) increased from 26.03 USD/barrel in 2002 to 31.06 USD/barrel in 2003. In 2005, it reached US$56.55 and in 2006 it went up to US$66.43 per barrel, as shown in Table 3.8.

As the Thai economy had just recovered from the financial crisis of 1997-98, oil shocks worried the government who feared that the effect of the substantial

hike in oil prices will have dampen economic recovery. The Thai government, therefore, took special concern for the impacts of 2003 oil shocks on the economy. The role of the Oil Fund, therefore, was increased again during this 2003-06 oil shock.

During 2003-2005, the Oil Fund, on behalf the government, introduced two phases of oil price subsidization.The first oil price subsidization was implemented between 8 February 2003-19 May 2003 and the second phase was implemented between 10 January 2004-13 July 2005. We will detail each of the schemes, in turn, later.

Table 3.8

World Crude Oil Price

Unit: US. Dollar/ Barrel

Period	Tapis	Oman	Dubai	Brent	West Texas
1998	13.80	12.07	12.15	13.10	14.38
1999	18.84	17.24	17.20	18.13	19.20
2000	29.86	26.53	26.26	29.00	30.40
2001	25.33	22.86	22.81	24.78	25.90
2002	25.55	23.86	23.77	25.06	26.02
2003	30.06	27.13	26.75	28.67	31.06
2004	41.20	34.38	33.69	38.22	41.44
2005	58.10	50.66	49.55	57.85	56.55
2006	70.35	62.85	61.77	66.02	66.43

Source**:** EPPO Journal

The Instruments of the Oil Fund

It is interesting to note that although other types of taxation imposed on oil have been kept steady, the fund rate is varied mainly so as to keep the domestic retail prices of oil close to their target levels according to the price stabilizing purpose. Because other types of tax rates namely excise, municipal, and VAT are rarely changed due to political standpoint and they are imposed on other government agencies, and the conversation fund rates, one type of the taxation for energy conservation purpose, is smaller relative to the oil fund rates, the announcement of the

maximum oil fund rate, therefore, can be varied according to the oil price stabilizing policy and the Oil Fund budget.

Under the 2003-2005 subsidy scheme, the oil fund rate announced by CEPA, again, as an instrument for controlling maximum price purpose, will be reversed. The fund was transferred from the government to oil retailers who passed it to the final users. As suggested in Table 3.7 the average oil fund rate in 2004 was -0.34 and -2.24 baht/litre, respectively, for benzene95 and HSD.

After abolishing the oil price stabilizing policy in 2005, the oil fund rate increased remarkably for repaying debt occurred during the subsidy period. According to the update announced byCEPA in October 2006, the maximum oil fund rate for benzene that can be charge is 4.00 baht/litre. This increase in the oil fund rate is caused from the large amount of debt occurring under the subsidy period. The oil Fund needs to increase its revenue, referred by the oil fund rate, to repay its debt occurring from the subsidy scheme. In sum, the Oil Fund, as the government tool, will use the oil fund rates as a tool to serve its objective.

The 2003-2005 Oil Subsidy Scheme

During the 2000s, Thailand implemented the first phase of its oil price stabilization scheme on 8 February 2003 controlling the ceiling of oil. Under the subsidy scheme, the Oil Fund pays a subsidy to wholesalers who pass it on to the retailers who pass it on to the end-users; therefore, retail prices are fixed at a ceiling level determined by government.

Retail prices of benzene 95 and benzene 91 and high-speed diesel (HSD) were fixed at 16.99, 15.99 and 14.79 baht/litre (or about 0.42, 0.40 and 0.37 UScent/litre), respectively. The total number of days under 2003 oil prices stabilization scheme was 101 days, with an average subsidy of 3.34 million baht/day from the oil fund.

In early 2004, the rapid growth for oil in the East and South Asia particularly in China and India and the less spare of OPEC drove the price of world crude oil substantially as a result of the climbing oil prices. The government introduced the second oil price stabilizing scheme starting on 10 January 2004. The

price ceilings, under the early scheme, were almost the same as those set in the first phase. Retail prices in Bangkok were fixed at 16.99, 16.19 and 14.59 baht/litre for benzene95, benzene91 and HSD, respectively. Under those first ceiling prices the highest subsidy amounts per day were 176.13 million, on 7 May 2004 and the accumulated debt during 10 January 2004 - 7 May 2004 increased to approximately 8 billion baht.

Due to the fact that the oil prices at that time were increasing, they generated a burden more than the government's expectation so that the government needed to adjust the ceiling of retail prices many times. The government raised the ceiling retail prices of benzene95 and benzene91 and then followed up with HSD. Table3.9 shows the ceiling prices of benzene and diesel under the 2004 subsidization scheme.

The 2004 oil prices stabilization scheme was gradually phased out. The stabilization scheme was initially abolished on 20 October 2004 floating retail prices of benzene95 and benzene91, but the subsidizing of diesel retail prices has continued. The difference column in Table 3.9 shows the subsidized amount/litre of benzene95, benzene91, and diesel. Diesel took the highest subsidy amount per litre at 6.61 baht/litre in October 2004 creating a large burden for the government resulting in the government gradually raised the ceiling price of diesel. Before phasing out the diesel subsidy, the ceiling price of diesel was increased up to 22.09 baht/litre from the first ceiling price at 14.59 baht/litre. Finally, the subsidizationscheme was absolutely phased out on 13 July 2005.

The consequence of the 2004 oil subsidy scheme induced a large amount of government debt. Under the 2004 subsidization scheme, the highest subsidy amount per day was 369.96 million per day and the accumulated total amount of subsidizing throughout the scheme was approximately 92 billion baht. Such subsidies reach about 1.4% of GDP in 2004. Taking into account a direct impact on the fiscal accounts deficit pressure, the Thai government revised the subsidy policy. Although providing an oil subsidization scheme would protect the fluctuation of the economy in the short run, there is a general consensus among the public agencies that the Oil Fund should no longer delay the effect of the high oil price by subsidizing. Finally, the Oil Fund abolished the scheme in July, as stated above.

Table 3.9

The Ceiling Retail Prices under 2004 Oil Price Stabilizing Scheme

Unit: Baht/litre

Date	Benzene 95			Benzene 95			High Speed Diesel		
	Retail	Actual	Diff.	Retail	Actual	Diff.	Retail	Actual	Diff.
10-Jan-04	16.99	19.76	-2.77	16.19	19.09	-2.90	14.59	15.50	-0.91
07-May-04	17.59	20.54	-2.95	16.79	19.85	-3.06	14.59	16.92	-2.33
08-Jun-04	18.19	19.77	-1.58	17.39	19.07	-1.68	14.59	16.32	-1.73
18-Jun-04	18.79	19.53	-0.74	17.99	18.83	-0.84	14.59	16.62	-2.03
29-Jul-04	19.39	20.73	-1.34	18.59	20.02	-1.43	14.59	18.57	-3.98
06-Aug-	19.99	21.31	-1.32	19.19	20.6	-1.41	14.59	19.03	-4.44
11-Aug-04	20.59	21.39	-0.80	19.79	20.68	-0.89	14.59	19.04	-4.45
17-Aug-04	21.19	21.79	-0.60	20.39	21.08	-0.69	14.59	19.45	-4.86
24-Aug-04	21.79	21.74	0.05	20.99	21.03	-0.04	14.59	19.65	-5.06
20-Oct-04	22.39	22.11	0.28	21.59	21.39	0.20	14.59	21.20	-6.61
22-Feb-05	20.49	-	-	19.69	-	-	15.19	18.97	-3.78
23-Mar-05	22.09	-	-	21.29	-	-	18.19	21.69	-3.50
8-Jun-05	22.54	-	-	21.74	-	-	18.69	20.57	-1.88
11-Jun-05	22.54	-	-	21.74	-	-	18.99	20.87	-1.88
14-Jun-05	22.94	-	-	22.14	-	-	19.39	21.27	-1.88
21-Jun-05	23.74	-	-	22.94	-	-	20.19	22.07	-1.88
24-Jun-05	24.14	-	-	23.34	-	-	20.59	22.47	-1.88
27-Jun-05	24.54	-	-	23.74	-	-	20.99	22.45	-1.46
30-Jun-05	24.94	-	-	24.14	-	-	21.39	22.85	-1.46
6-Jul-05	25.34	-	-	24.54	-	-	21.79	23.25	-1.46
9-Jul-05	25.74	-	-	24.94	-	-	22.09	23.55	-1.46
13-Jul-05	25.74	-	-	24.94	-	-	22.99	22.99	0.00

Source: EPPO

3.3 Price Structure of Petroleum Products in Thailand

As mentioned, the Thailand oil industry was regulated during 1979-1990. During the regulation period, oil imports and prices were controlled. Besides, a number of oil companies were also restricted by the government license. Presumably, during the regulation period, the oil market in Thailand resemble an oligopoly market as there were 4 private oil companies, SHELL, ESSO, CALTEX, and THAIL OIL, and 2 state-owned oil companies, PTT and BANGCHAK. Among those companies, PTT was the dominant company and was the price leader. With regards to oil imports, they were controlled using the standard measure, i.e., quota. In contrast, the price controls were more complicated and had more details. Even though the Thai government effectively deregulated oil industry since on August 19, 1991, the price of

oil has often intervened imposing the oil fund rate determined by government on petroleum products.

In the presence of the oil regulation period, the regulation of oil prices was done on wholesale and retail prices. The retail prices were calculated from the wholesale prices plus a marketing margin determined by the government, and VAT. The wholesale prices calculated from the ex-refinery price or imported prices plus tax rate, oil fund rate, and conservation fund rate. The ex-refinery prices mean the selling prices at the domestic refinery company, which are determined by the cost of crude oil price plus the refinery cost.

However, the ex-refinery prices of oil were announced by CEPA and based on the posting and spot prices in Singapore oil market. In the early stage of the refinery industry, the capacities of the refining were low and did not satisfy demand while the production cost were high The government at that time, with the intention helping the domestic refinery industries, determined the regulation for calculating the ex-refinery price using the import parity base. With regards to the imported oil prices, they were also regulated and based on Singapore postings and spot prices. More importantly, the ex-refinery and imported prices were set based on Singapore posing with unclear time lag and formulae were changed from time to time upon the request of oil companies.

Regarding the reference of Thailand oil prices, Singapore posting and spot prices, Thai government used Singapore market because Singapore was the hub of oil trading in the region. It had considerable oil trading volumes and traders in this region. The oil prices in Singapore market, therefore, would reflect the market mechanism of international oil market more closely. Table 3.10 shows the price of petroleum products at Singapore market.

Table 3.10

Singapore Market Oil Price

Unit: US. Dollar/ Barrel

Period	Benzene 95	Benzene 92	Kerosene	High Speed	Fuel Oil
1998	18.10	16.23	16.31	15.40	11.35
1999	21.02	20.20	21.44	19.14	16.14
2000	32.64	30.20	34.39	32.58	25.41
2001	27.50	25.36	28.30	27.30	21.23
2002	27.95	26.78	27.93	27.41	23.37
2003	33.69	32.64	32.90	32.31	27.37
2004	47.23	46.24	47.47	45.69	29.50
2005	62.38	61.36	67.97	41.30	40.23
2006	73.20	72.38	80.60	76.79	48.14
2007(FEB)	64.85	63.66	70.90	68.43	43.19

Source: EPPO Journal

The retail price structure of petroleum products in Thailand can be summarized as the following:

Wholesale Prices = Ex-refinery or imported oil prices + excise tax + municipal tax + *oil fund*+ conservation fund

Retail Prices = Wholesale prices + market margin + VAT

The details for retail prices setting of petroleum products as at 23 May 2007 are shown in Table 3.11.

In regards to the Thailand petroleum products price structure, the retail prices of petroleum products comprise of the cost of oil depicted by ex-refined price or imported oil price around 50-60 percent, taxation and fund approximately 30-35 percent and the marketing margin around 5-10 percent.

The ex-refinery price will be fluctuated according to the announcement of the CEPA, which is based on Singapore posting price, but the retail prices, under the regulation, would be kept close to their target using the part of tax, the fund rate and marketing margin.

It is now clear that not only world oil prices but also government policies, represented by many types of tax rates and the fund rate, are substantial parts of oil retail prices structure. The excise and municipal tax rate, again, are rarely changed, therefore, the oil fund rate is usually used as the tool to stabilize the retail oil prices. Hence, the change of domestic oil retail prices depends mostly on the change in international market prices and the oil fund rate.

In the presence of full deregulation period, after 1991, the Thailand government abolished the regulation of imported quota, ex-refinery and imported prices of petroleum products. The refinery companies announce their refinery prices. The prices of petroleum products become more competitive. However, it is of course very tempting for the oil companies to charge the consumers unreasonably high prices. There are 6 oil companies and less numbers of oil traders so they can create price collusion. The marketing margin of petroleum products has increased since the deregulation and reached its highest level of about 2% in 1998.

However, in 1999, the oil market in Thailand was developed and a price setting mechanism was more determined by market. The oil market moved forward to the competitive market. There were a large number of traders and the marketing margin dropped sharply, with its lowest level in 2000 at less than 0.25%, and then stabilized. Both wholesale and retail prices of petroleum products, with the exception of LPG price, were competitive.

As presented before, according to the 2003-2005 oil shocks, Thailand's oil market was turned out from competitive market and oil price settings are distorted again. The oil price regulation was implemented by oil price subsidization scheme in 2003 and 2004. The rationale of the intervention was, the Thai government at that time was worried that the sharp rise in world oil prices would dampen the economy which had been rising since the financial crisis of 1997. Then the government, through the Oil Fund, implemented the subsidy scheme for benzene and diesel keeping those domestic retail prices lower than they should be.

The subsidization scheme was abolished for benzene in late 2004 and for diesel mid 2005. The Oil Fund, therefore, monitors the oil retail prices using the managed float system. Obviously, without the subsidies scheme, during 2005-2007, the oil retail prices increased substantially as shown in Table 3.12. In 2006, the highest retail price of benzene and diesel were recorded at 27.61 baht per litre and 22.96 baht per litre, respectively.

Table 3.11

Retail Price of Petroleum Products in Bangkok

Unit: Baht/Litre

Period	Benzene 95	Benzene 91	High Speed Diesel
1998	11.86	11.19	9.18
1999	11.99	11.18	8.97
2000	15.64	14.68	12.95
2001	15.52	14.52	13.43
2002	15.30	14.30	13.11
2003	16.64	15.65	14.02
2004	19.07	18.47	14.59
2005	24.20	23.10	19.98
2006	27.61	26.81	25.61
2007	29.23	28.35	25.69
2008(MAR)	33.43	32.23	29.82

Source: EPPO Journal

Remark: 1 Barrel $\approx$ 158.99 Litre

Table 3.12

Price Structure Of Petroleum Product in Bangkok
23 MAY 2007

UNIT:Baht/Litre

	Ex-Refinery (Avg)	Tax B./Litre	M. Tax B./Litre	Oil Fund (1)	Consv. Fund	Wholesale Price(WS)	VAT	WS&VAT	Marketing Margin	VAT	Retail Price
ULG 95R ; UNL	20.3255	3.685	0.3685	3.46	0.07	27.909	1.95363	29.86263	0.492869	0.034501	30.39
GASOHOL95	20.351447	3.3165	0.33165	0.6	0.063	24.6626	1.726382	26.38898	0.65516	0.045861	27.09
ULG 91R ; UNL	19.9016	3.685	0.3685	3.26	0.07	27.2851	1.909957	29.19506	0.369106	0.025837	29.59
GASOHOL91	20.166433	3.3165	0.33165	0.6	0.063	24.47758	1.713431	26.19101	0.5598	0.039186	26.79
KEROSENE	18.487136	3.055	0.3055	0.1	0.07	22.01764	1.541235	23.55887	1.309467	0.091663	24.96
H-DIESEL(0.035%S)	18.6877	2.305	0.2305	1.5	0.07	22.7932	1.595524	24.38872	0.889043	0.062233	25.34
Biodiesel (B5)	19.203315	2.1898	0.21898	0.3	0.0665	21.9786	1.538502	23.5171	1.049442	0.073461	24.64
H-DIESEL(0.7%S)	18.0725	2.405	0.2405	-0.27492	0.07	20.51308	1.435916	21.949	1.3	0.091	23.34
L-DIESEL	18.25	2.405	0.2405	1.5	0.07	22.4655	1.572585	24.03809	1.039173	0.072742	25.15
FUEL600 (1) 2%S	13.039273	0.696655	0.069666	0.06	0.07	13.93559	0.975492	14.91109	2.662537	0.186378	17.76
FUEL1500 (2) 2%S	12.2527	0.65472	0.065472	0.06	0.07	13.10289	0.917202	14.02009	2.700847	0.189059	16.91
LPG-SMALL (B/KG.)	11.179	2.17	0.217	-1.1091	0	12.4569	0.871983	13.32888	3.2566	0.227962	16.81
LPG-LARGE (B/KG.)	11.179	2.17	0.217	-1.1091	0	12.4569	0.871983	13.32888	3.2566	0.227962	16.81
LPG-CARS (B/KG.)	11.179	2.17	0.217	-1.1091	0	12.4569	0.871983	13.32888	3.2566	0.227962	16.81

Exchange Rate	=	34.7109	Baht/$
AVG Marketing Margin	=	1.138997	Baht/Litre
AVG Gross Refinery Margin	=	2.661568	Baht/Litre
Ethanol Reference Price	=	18.62	Baht/Litre
Biodiesel(B100) Reference Price	=	29	Baht/Litre

Source: Energy Policy and Planning Office Ministry of Energy, Thailand. (www.eppo.go.th)

3.4 The Consequences from The Oil Subsidy Scheme

According to the government rationale, the oil subsidy scheme can maintain the development process and promote growth of the Thai economy. However there are undesired effects occurring from the subsidy scheme. From an economic standpoint, it is known that subsidies are distortionary and reduce welfare from perfectly competitive markets. In this section we will provide, briefly, consequences of the subsidization policy of the Oil Fund.

Inefficiency Oil Consumption

Subsidies (negative oil fund rate) are money paid to producers or retailers of a given oil product by the government, in order to lower the retail price or fix it. Therefore, under the subsidization scheme, the domestic oil retail prices are cheaper than the international price. Consumers do not recognize the necessity to use oil efficiently and economically when oil prices were subsidized. This would lead to excessive oil consumption and wastage.

Triggering Twin Deficit Problem

As Thailand is the oil importing dependency country, the oil subsidy increases import bills that have triggered Thailand's trade balance into large deficit. This result in depressing the baht value, making imported oil more expensive, and pressure the inflation rate the subsidies are initially supposed to control.

According to recent oil shocks, during 2003-2004, the Thai government expected that this oil shock may not be a long-lived phenomenon, thus implementing the subsidy scheme using the reserve from the Oil Fund and government budget to support the subsidization. Due to the continuous and rapid increase in international oil prices, the reserves cannot account for the subsidy, the Oil Fund borne the large amount of debt, THB92 billion. Besides, it is foreseen that if the world oil prices keep rising, the oil subsidy scheme can not be sustained. It is merely delaying the effect of

oil price shocks with the large amount of debt financed by short-terms bank loans from the Government Saving Banks and Thai Military Bank.

Considerably, the large amount of debt from subsidy scheme will be harmful to the government budget. The government cannot bear the burden of a huge subsidy on oil. In order to decrease the government's budget burden in 2005, Ministry of Energy permitted the Energy Fund Administration Institute to issue bonds at attractive rates for refinancing the short-term debt, which it expected would be able to redeem through the future oil fund rates levied on oil products.

Although these bonds are not directly guaranteed by the government, these bonds will be sold to the government when they are not attractive for investors. This means that government budget, ultimately, is affected. The large burden from oil subsidy scheme may lead to the government's budget failure.

Decreasing in Welfare of Future Consumer

Bigger budget deficits and trade accounts imply higher interest rates which crowd out the private investment and, in turn, dampen economic performance in the long run. Consequently, the social welfare of the future generation will be affected. This is a cost that should be taken into account in the subsidization policy. Although subsidies may provide short-term relief from the pain of higher oil prices, they do so at high opportunity cost and at the risk of loosing macroeconomic stability, in the long run.

Due to the plan for bond redemption using the oil fund rates, if the Oil Fund maintains the oil fund rates at about 0.5 baht/litre, as the rate before the subsidization, this will take more than five years for bonds redemption and will not be attractive for investors. Taking this reason into consideration, the Oil Fund in the future is expected to announce the high oil fund rates levied on oil products in order to fully repay bonds and their interest burden with in the short run. Therefore, when the world price decreases the domestic retail prices will remain higher than the world oil prices due to the high fund rate for substituting the negative fund rate during the subsidization period, as is occurring in Thailand presently.

As shown in Table 3.7, before the crisis the fund rate for benzene was 0.50 baht/litre, under the subsidy scheme, in 2004, benzene95 was imposed at -0.34 baht/litre; after abolishing the subsidy scheme the rate imposed on benzene95 was increased from year to year until in 2007 the fund rate was 3.46 baht/litre. According to this measure, the government does not concern itself about the aggregate social wealth in the long run. The consumers who receive the subsidy at present may not be the ones who must pay the higher fund rate in the future. It may lead to inequality between present and future consumers. In addition, the subsidies, again, create inefficiency and uneconomical oil consumption, and as stated above, the more oil consumers use the more debt the government bears, leading to the imposing of higher oil fund rates. The future consumers, therefore, will pay more than they should for oil consumption and they are ones who will receive the ultimate burden from the oil subsidy policy.

Imbalance in Petroleum Products Use

The oil fund rate on diesel is favored by the Oil Fund, as shown in Table 3.7; the government provides larger subsidies for diesel than for gasoline due to the higher impact of diesel on the economy. The relative size of subsidies for different petroleum products also matters. This will lead to cross product subsidization creating imbalances in the demand and supply of petroleum products. Diesel was levied at lower tax and oil fund rates. It was priced significantly lower, encouraging higher consumption and resulting in a shift in the use from gasoline to diesel. i.e., engine modification for shifting to diesel.

Inequality allocation

Oil price subsidies almost always benefit rich income households more than the poor, because richer households consume more energy. Richer households, therefore, received a disproportionate share of the benefits.

Subsidies are implemented due to lower costs for producer then those lower costs should translate into reduced market prices that benefit consumers. This

intention, however, ignores the allocation of subsidies between producers and consumers.

Discourage Oil Market Development

The subsidization scheme will discourage the development of an oil market as the oil price regulation will deter investment from private investors both in domestic and foreign countries. It, in turn, impedes the accessibility of energy-efficient technologies and related know-how.