Crude Oil Prices After 1999: Trends in the supply-demand and oil futures market[1]

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1. Introduction: Recent crude oil price volatility and its background

For the past five years, crude oil prices on the international market have fluctuated significantly. The futures prices of WTI crude oil, a representative reference of world crude oil market, as listed on NYMEX (front month contracts), declined steadily from the beginning of 1998 and reached $10.7/bbl low in December of that year. Though the WTI futures prices subsequently declined even further, they turned upward in March 1999 and by February 2000 had exceeded the 30-dollar threshold. After subsequent fluctuations, crude oil prices peaked at $37.2 in September 2000, resulting in an annual average of $30.3 for the year. However, the prices again moved downward after November 2000, declining gradually throughout 2001. After the terrorist attacks on the United States in September 2001, the crude oil prices plummeted to $17.5 in November of that year. Subsequently, however, crude oil prices began another upward trend in 2002, rising from $17 in mid January to $27 in early April, a gain of $10 in three months.

These sudden swings and fluctuations in crude oil prices are caused by several factors concerning the so-called “supply and demand fundamentals,” such as international oil demand fluctuations, led by Asia and the United States, changing oil production conditions in non-OPEC oil producing countries, implementation of production adjustments by OPEC countries, changes in oil inventories accompanied by changing supply and demand balances, and tightened supply and demand conditions in the U.S. petroleum products market. Combinations of these factors generated significant and repeated tightening and softening of supply and demand conditions in the international oil market, resulting in wide fluctuations of crude oil prices.

As for the recent fluctuations, the characteristics and impacts of price formation in the oil futures markets cannot be overlooked. In the oil futures markets, such as NYMEX, highly volatile transactions are actively performed, driven by “market psychology” and “speculations” of the market participants. Prices are heavily influenced by speculators or those that have little to do with the

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petroleum business. Under the circumstances, it can be concluded that crude oil price movements after 1998 have indicated the mid-term trends determined by the supply and demand fundamentals, and the excessive price fluctuations taking place in the short term[2].

The following sections summarize important points concerning trends in supply and demand fundamentals and the impacts of oil futures markets as factors affecting recent crude oil price fluctuations, as well as the implications these hold for Japan.

2. Trends in oil demand and their impacts

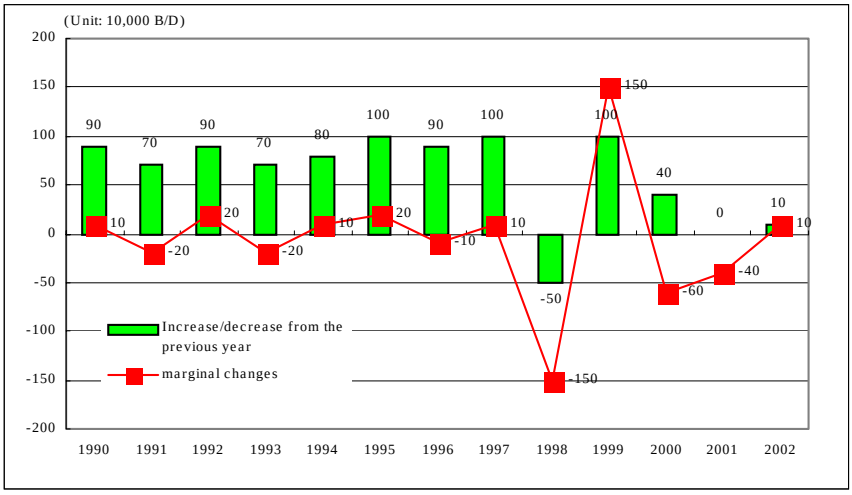
It was the significant demand changes in Asia that had the greatest impact on international oil demand trend from 1998 through 1999. Until 1997, the Asia-Pacific region led global oil demand with an annual demand growth of nearly one million B/D; however, the oil demand in 1998 plummeted by a half million B/D from the previous year due to the Asian economic crisis that took place in 1997. Still, the regional economy rapidly recovered, contrary to general expectations, through increased exports to the robust U.S. market, and the oil demand again increased by one million B/D in 1999 over the previous year (Fig. 1). In this manner, the drastic changes in Asian oil demand had significant impacts on the international oil market in terms of marginal differences in comparison to previous years.

The U.S. economy that supported the 1999 recovery of the Asian oil demand faced a downturn in the latter half of 2000. With the stagnation of the U.S. economy, a leader of the global economy, the rate of increase in international oil demand slowed significantly in and after 2000. The terrorist attacks on the United States in September 2001 triggered a serious recession in the U.S. economy, negatively affecting both Asia and Europe, and creating an atmosphere likened to a "synchronized world-wide recession." In 2001, oil demand in the United States declined from the level of the previous year for the first time in a decade.

Under these circumstances, global oil demand developed as follows: 73.6 million B/D in 1998, an increase of 0.7% over the previous year; 75.2 million B/D in 1999, a strong increase of 2.2%; 75.9 million B/D in 2000, an increase of 0.9%; and 76.0 million B/D in 2001, a minimal increase of 0.1%. The points are: the strong increase in demand led by the Asian market in 1999, and the dwindling increase in demand seen in and after 2001. The above trends in oil demand, leading to tight supply and demand balances in and after 1999 in the international oil market and the slackening in and after 2001, seem to have been important factors in formulating the basis of the crude oil price fluctuations.

2 For the characteristics of price formation in the NYMEX oil futures market, refer to "Crude Oil Price Prospects after OPEC General Meeting" by Ken Koyama, the Institute of Energy Economics, Japan, NO. 361st Regular Research Meeting on April 13, 2000.

Fig. 1. Oil demand fluctuations in the Asia-Pacific region



(Source) Prepared by IEEJ, based on IEA "Oil Market Report" and other materials.

3. Trends in oil production by non-OPEC producers and their impacts

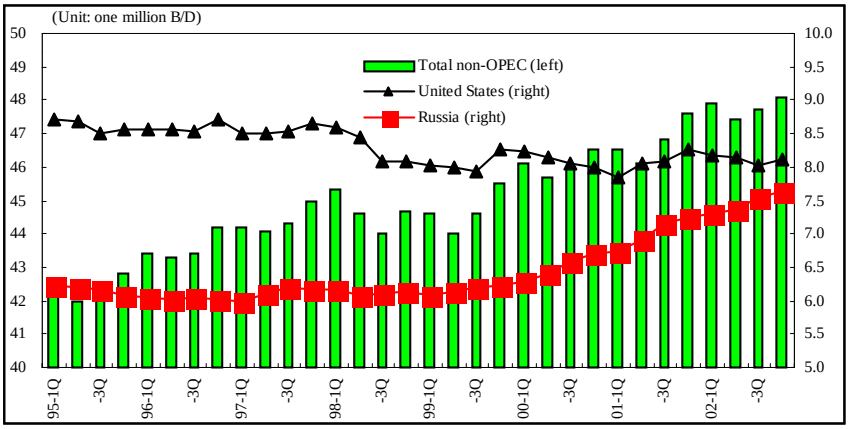
There are two important points to be noted concerning the oil production trends in non-OPEC oil producing countries. The first is that they generally tend to produce crude oil at their fullest capacity, except in such cases in which they need to reduce production in concert with OPEC. The second is that oil production costs in non-OPEC countries are generally higher than those among OPEC oil producers in the Middle East. As a result, oil production in non-OPEC countries is directly influenced by the investments of international oil companies in their upstream sector and is sensitive to oil price movements.

Dwindling crude oil prices that persisted until the beginning of 1999 greatly depressed the income and cash flow situations of the international oil companies, including the Majors, resulting in significant reductions in investment in the upstream sector of the oil business. This was the direct cause of the production declines at non-OPEC, in particular high-cost regions (e.g. marginal oil fields in the United States) in 1999. In addition, the concerted production cuts by some non-OPEC oil producing countries, such as Mexico and Norway, in coordination with OPEC, were another significant factor for the lower non-OPEC crude oil production in 1999. In this manner, oil production in non-OPEC countries, which had consistently expanded throughout the 1990s, leveled off at 46.9 million B/D in 1999 (Fig. 2). With expansive oil demands in that year, the dwindling oil production by non-OPEC producers, which produced about 60% of global oil supplies, tightened the international petroleum supply and demand balance and significantly contributed to the soaring crude oil prices after 1999.

However, to respond to steeply rising crude oil prices, the opposite cycle then took place. The

international oil companies subsequently improved cash flows and expanded capital investments in the upstream sector. Under these circumstances, production by non-OPEC oil producing countries increased to 46.1 million B/D in 2000 (an increase of 1.2 million B/D over the previous year) and 46.8 million B/D in 2001 (an increase of 0.7 million B/D). In the meanwhile, the biggest production increase was achieved by Russia, which had overcome the long slump it had been experiencing since the latter half of the 1980s. In and after 2000, as international oil demand slackened, the increasing oil production of non-OPEC countries greatly contributed to softening of supply and demand, and significantly contributed to lowering crude oil prices.

Fig. 2. Oil production by non-OPEC countries



(Source) Prepared from data on IEA "Oil Market Report."

4. Trends in OPEC crude oil production and their impacts

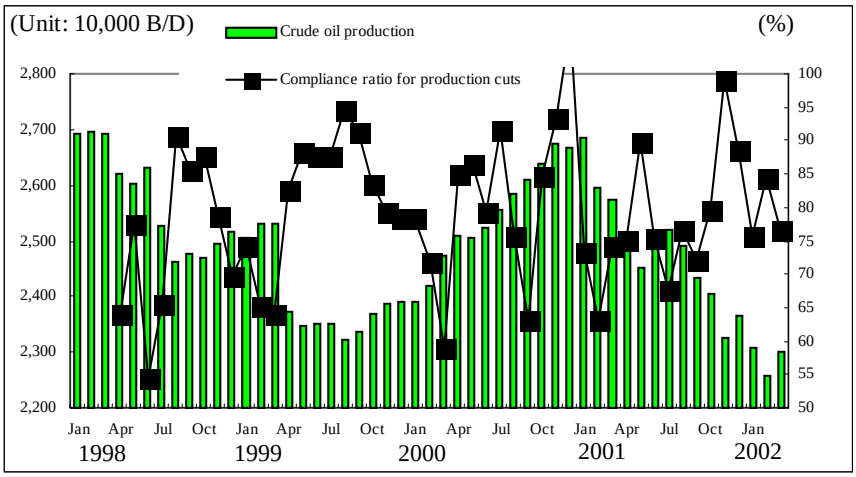
OPEC's production policy had the greatest influence on international petroleum supply and demand balances and crude oil price trends in and after 1999. Faced with the unprecedented low price of $10 per barrel, OPEC countries, driven by a sense of crisis, agreed on consecutive large-scale production cuts in March and June 1998, and then again in March 1999. The total reduction on these three cut backs combined reached 4.32 million B/D by the ten OPEC countries (excluding Iraq). These production restrictions were joined by some non-OPEC producers, and collaboration among major OPEC countries was reinforced, specifically among Saudi Arabia, Venezuela, and Iran, after March 1999. Under these circumstances, large-scale production curtailments were effectively conducted in good compliance (Fig. 3). With global oil demand increasing and non-OPEC oil production remaining sluggish, the curtailments by OPEC producers rapidly tightened the international oil market and contributed to skyrocketing crude oil prices after March 1999.

In 2000, as crude oil prices rose above the 30-dollar level, OPEC became wary of excessively high prices and shifted its policy to increase production in March 2000. Following the March production

increase, OPEC also implemented production increases in June, September, and October 2000. With the four production increases, the total increase from OPEC reached at 3.72 million B/D. These increases, at first, did not lower crude oil prices due to the heightened political tensions in the Middle East, and tightened supply and demand conditions on petroleum products in the United States, which will be touched on later. However, the OPEC production increase, coupled with slackening oil demand in and after 2000 and production recoveries by non-OPEC producers, contributed to lower prices in and after November 2000.

In 2001, OPEC turned again to production cuts to protect crude oil prices within the target range ($22-$28) for the OPEC basket price agreed in the general meeting in March 2000. With successive production cuts in January, March, and July (totaling 3.5 million B/D), crude oil prices declined but remained within the target range. However, after the terrorist attacks on the United States on September 11, oil demand dwindled under global recession, pulling crude oil prices far below the target price level. In order to stabilize market conditions OPEC attempted to collaborate with major non-OPEC producers, and finally succeeded in reaching a compromise with Russia and other oil producing countries, and enhanced production cuts in January 2002. At that point, the production quota for OPEC was 21.7 million B/D, the lowest level in the past ten years. In this way, OPEC has remained the biggest factor in the creation of crude oil price fluctuations since 1999.

Fig. 3. OPEC oil production (excluding Iraq) and compliance rates of its quota



(Source) Prepared from data on IEA “Oil Market Report,” etc.

5. Trends in oil supply-demand balances and inventories, and their impacts

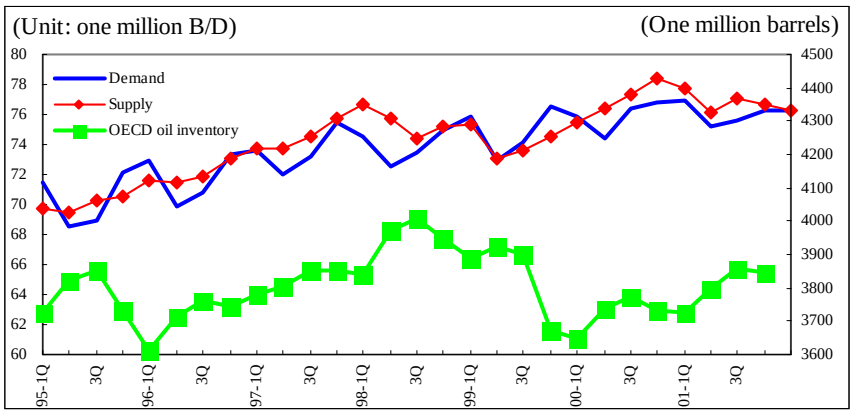
With the oil supply and demand trends outlined above, the supply-demand balances in the international oil market fluctuated between slackening and tightening. As indicated in the figure below (Fig. 4), after the first quarter of 1997, over supply in the international oil market continued until the first quarter

of 1999. As a result, the OECD oil inventory kept increasing, reaching 4.01 billion barrels in the third quarter of 1998. Furthermore, after the first quarter of 1999, short supply continued until the first quarter of 2000, rapidly decreasing the OECD oil inventory (which hit 3.68 billion barrels at the end of 1999, the lowest OECD oil inventory level since 1992), followed until recently by over supply due to sluggish oil demand and increased production by non-OPEC countries.

In this sense, the oil inventories seems to correctly reflect the supply-demand balances in the international oil market. Although there may be some problems in the precision of inventory statistics, the oil inventories of the OECD region, which accounts about 60% of the global oil market, present fairly good pictures of the changing trends in the international supply-demand situations. It can be thus concluded that the dwindling crude oil prices from 1998 through the beginning of 1999, soaring crude oil prices from the beginning of 1999 through 2000, and declining crude oil prices after the end of 2000 were caused by changing supply-demand balances of the international oil market, that is, the supply and demand fundamentals, as indicated in the oil inventory data.

In addition, there is another factor affecting oil inventories and crude oil prices. As described later, the effects of the oil futures markets cannot be neglected in the determination of crude oil prices. Of all the information that players in oil futures markets use for conducting transactions, oil inventory statistics are extremely important. In extreme cases, some players depend solely on inventory data for their short-term transactions. These participants in futures markets place particular emphasis on the U.S. oil inventory statistics issued weekly by the DOE, etc. In determination of crude oil prices, close and complicated “interconnections” are thus formulated among the international and U.S. fundamentals, U.S. oil inventory trends, and the transaction of participants in the oil futures markets.

Fig. 4. International oil supply-demand balances and OECD oil inventory



(Source) Prepared from data of IEA “Oil Market Report,” etc.

6. The problem of "missing barrels" and its impact

The term "missing barrels" refers to certain inconsistencies found between supply and demand differences implied in data concerning oil production and consumption in the international market and the actual oil inventory fluctuations that were observed[3]. This problem has attracted the attention of market participants since the latter half of the 1990s, and since that time attempts have also been made to identify its causes. The following points, among others, are now cited as causes of this phenomenon: (1) the statistics of oil production/consumption, etc. are unreliable, particularly in non-OECD countries; (2) oil inventory data is not collected at all in many non-OECD countries; (3) there is some room for improvement even in OECD oil inventory statistics, as indicated in ex-post revision frequently made; (4) "secondary and tertiary inventories" at the distribution and end-user stages are also not collected even in OECD countries; and (5) under these circumstances, oil futures price structures (contango / backwardation) affect the market participants' incentives for holding inventories, and this may cause fluctuations in the speculative holdings of inventories.

Certain aspects of this problem have recently attracted many observers' attention; for example, the OECD oil inventories did not decrease as rapidly as observed in the supply and demand balances amid the short supply in and after 1999, and the actually observed increases of the OECD oil inventories seemed more moderate than expected amid the over supply in and after 2000. As for the former, one of the primary causes mentioned was that the futures prices structure of significant backwardation in the face of sharp increases in the prompt barrels, resulting in the draw down of large portions of the missing barrels generated in the previous year. As for the latter, prices for the prompt barrels continued to rise and remain high due to the political tensions in the Middle East and problems in the U.S. petroleum products market, while futures price structures remained backwardation. Due to the backwardation factor, there were few incentives for private-sector oil companies to hold inventory. It was also pointed out that consumers and others accumulated secondary and tertiary inventories in anticipation of supply interruptions and price hikes, resulted in low primary inventories.

The "missing barrels" are problematic in that they may send the wrong signals to markets, and may be conducive to excessive oil price fluctuations. As stated in the previous section, participants in futures transactions now tend to focus solely on changes in oil inventories. Against this backdrop, if the inventory trends are detached from the actual trends of supply and demand fundamentals due to these "missing barrels," transactions based on this misleading data may quite possibly cause price overshooting (or undershooting)[4]. If OPEC implements large-scale production adjustments based on

[3] For example, although large supply surpluses are observed in production/consumption statistics, oil inventories may not increase significantly enough. In such cases, there must be "missing" oil somewhere.

[4] For a limited (not long) period of time, while missing barrels exist, such a vicious cycle may even take place in which

these “wrong” price signals and inventory situations, their actions may, after a certain time lag, expand the next phase of supply-demand imbalances.

It is difficult to completely eliminate the so-called “missing barrels,” as may be anticipated from the complexity of the causes, and the problem may quite possibly be taking place on a large scale. In this sense, the problems caused by the “missing barrels” will continue to be a significant factor of instability in the international oil market in the future.

7. Supply and demand trends in the U.S. petroleum products market and their impacts

Partly because OPEC moved to increase production in and after March 2000, the international supply and demand trends in 2000 (particularly for crude oil) slackened as a whole. Nevertheless, the price of crude oil reached $37 in September 2000, and remained high until the end of the year. One of the reasons mentioned was the effect of the tight supply and demand situation in the U.S. petroleum products market and the soaring product prices there. In fact, the prices of heating oil in the U.S. first jumped in the early 2000, followed by soaring gasoline prices in the summer. From this point, it can be argued that crude oil prices in 2000 were generally led by petroleum product prices in the U.S..

Behind the soaring petroleum product prices in the United States, certain bottlenecks seem to have existed in petroleum product supplies. In their efforts for thorough rationalization, American oil companies closed inefficient and unprofitable refineries and reduced their production capacities since the early 1980s; as a result, American refineries are now operating at close to their maximum capacity. Under the circumstances, tight supplies seemed prevalent in the market because (1) increased crude oil supplies in the international market in and after 2000 did not significantly contribute to increased production of petroleum products in the United States, and (2) a perception emerged that further tight supply-demand conditions would immediately ensue if there is any refinery accident and the like. In addition, oil companies took such strategies as reducing working capital as a means of rationalization, and minimizing oil inventories to reduce costs. As stated earlier, partly because the oil futures price backwardation persisted by the end of 2000, American private-sector oil companies maintained their petroleum product inventories at very low levels, which enhanced perceptions of tight supplies in the market, and created a vicious circle.

In addition, when new gasoline (RFG II) accompanied by stricter mandatory quality standards was introduced in the summer of 2000, its supplies were rather limited due to (1) the delay in upgrading investment, (2) lawsuits among oil companies on patents for manufacturing the new gasoline, and (3)

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low observed inventory levels accelerate increases prices and the low prices further depress inventory levels.

restricted supply caused by quality regulations being segmented for individual regions. The results of this limited supply were skyrocketing gasoline prices, particularly in parts of the Midwest. Furthermore, environmental regulations seem to have restricted the supply of petroleum products; even the construction of secondary facilities for quality improvement was not easy under stricter environmental regulations.

In and after 2001, thanks to slackened U.S. oil demands, increased imports of petroleum products, and accumulated experience in supplying the new gasoline, the petroleum products markets seemed to have calm down. There have been no developments in petroleum product prices causing skyrocketing crude oil prices since 2001. However, potential bottlenecks in the supply of petroleum products, as stated above, have not been completely eliminated, and remain as a structural problem. Thus, it is necessary to watch future developments in this regard closely.

8. Price formation in crude oil futures markets and its impact on price trends

Crude oil futures transactions have grown steadily since their initial listing in NYMEX in 1983. In 2001, total volume of crude oil futures transaction in NYMEX reached 37.53 billion barrels per year (102.82 million B/D). There are several rules or regulations imposed on trading crude oil futures in NYMEX, such as reporting limits, position limits, and price fluctuation limits to ensure transparency, fairness, and liquidity. Market participants performing transactions exceeding certain limits are categorized into (1) "commercial participants," involved in the oil business, such as oil majors, oil producers, and refiners, and (2) "non-commercial participants" not engaged in the oil business, such as hedge funds and individual investors[5]. Recently, the impact of transactions by non-commercial participants, or speculators, on price formation processes has drawn particular attention. Non-commercial participants, as evident from the definition, have no interest in the actual commodity of "oil." They are simply "speculators" trying to gain profits through futures transactions. In the current NYMEX crude oil futures market, about 20-30% of the total volume is traded by these non-commercial participants (based on open interests). As non-reporting participants (many of whom are considered to be speculators) account for about 30% of all participants, the percentage of speculators' shares in NYMEX crude oil futures transactions may range from 20% to 50% at the maximum.

As there are various players to be found among speculators, generalizations may be difficult, but their transactions are frequently characterized by (1) portfolio trading between various markets (stock, bond,

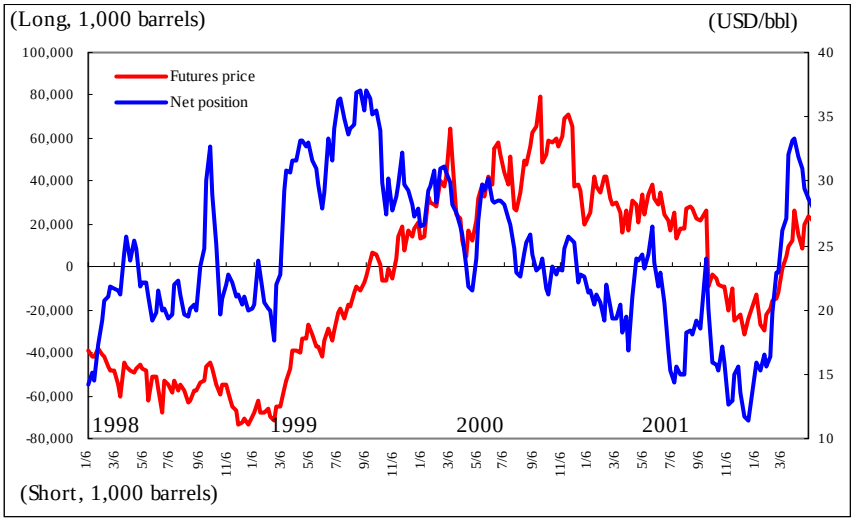
[5] Small-scale participants not reaching reporting limits are classified as "non reporting participants." For transaction status by participant, please refer to the Commitment of Traders Report issued weekly by the CFTC (Commodity Futures Trading Commission).

currency, and commodity), (2) heavy use of technical analyses (chart analyses) and sophisticated computer-programmed trading, and (3) emphasis on the U.S. oil inventory as the fundamental indicator. In addition to these characteristics concerning non-commercial trading, which enhance the importance of participants as speculators, transactions are heavily influenced by such factors as: supply and demand fundamentals; political development and reactions; and "speculations" and "psychological factors" on the actions and reactions of other trade participants. Given these circumstances, (1) crude oil futures prices tend to fluctuate quite significantly over a day's trading, (2) certain incidents may trigger huge fluctuations of prices, and (3) excessive price fluctuations (overshooting / undershooting) may occur.

As for the influence of non-commercial traders on crude oil futures price trends in NYMEX, certain levels of co-relations have been observed in terms of changes in prices and trading positions. However, the "intensity " of the correlation varies from period to period. For example, when crude oil prices were soaring after early 1999, it was apparent that non-commercial participants abruptly shifted their positions from the net short position (net selling) they had held immediately before the price rising phase to the net long position (net buying), and in fact took significant net long positions. In this sense, it can be said that fairly strong correlations existed between the soaring crude oil prices during this period and the trading by non-commercial participants (Fig. 5). However, they soon started to reorganize their positions to increase short positions, a move that was further reinforced in 2000. In 2001, they shifted to taking significant net short (net selling) positions. On the other hand, crude oil prices remained high in 2000, gradually declining in 2001 until the terrorist attacks in September, subsequent to which they plummeted. In this regard, after 2000 the influence of non-commercial participants on crude oil price trends seems to be relatively small[6].

[6] During the period after January 2002, in which crude oil prices rose again, non-commercial participants again took significant net long positions, resulting in strong correlations.

Fig. 5. Net positions by non-commercial participants and WTI crude oil prices



(Source) Prepared by IEEJ from various reference materials.

Still, it has been pointed out that: (1) it is quite difficult for any trade participants to make arbitrary price manipulations due to the scale of the NYMEX futures markets and various trading regulations[7]; and (2) it is almost impossible for any trade participants to formulate mid- to long-term price trends contrary to supply and demand fundamentals, except within a single day or for daily price fluctuations[8]. In other words, due to the influences of speculative transactions and characteristics of price formations in the current futures market, large price fluctuations may take place that may be inconsistent with the fundamentals in the "short term." However, as to the mid- to long-term trends, such as soaring crude oil prices after 1999 and depressed prices after 2001, supply and demand fundamentals played the decisive roles.

The problem is that although price formations in the current oil futures markets cannot create any mid- to long-term price trends, they may still create "excessive volatility" in crude oil prices. At present, as price information derived from oil futures markets, such as NYMEX, sends the most important signals to the international oil market, enhanced "excessively volatile" prices may send the wrong signals, triggering "excessive" reactions in supply and demand, and causing the next "excessive" price fluctuations. In this sense, there is concern about a structural problem whereby once a major price fluctuation takes place, it is not easily stabilized.

[7] It has been pointed out that certain influential players can manipulate prices in the Brent forward market and the CFD (contract for difference) market recently.
[8] In overseas interviews conducted to compile this report, many industry analysts and experts mentioned this point.

9. Measures taken by major countries against soaring crude oil prices

It has been noteworthy that, against the soaring crude oil prices after 1999 and the subsequent price fluctuations, major oil consumers, such as the United States and Europe, as well as major players in the international oil market, such as OPEC oil-producing countries, deployed highly strategic measures and actions based on their respective political motives and circumstances.

In the United States, (1) there is a "climate" in which gasoline prices, once significantly increased, may trigger political reactions, as gasoline price trends are quite closely links to people's daily lives, and (2) various political reactions took place in and after 2000, when crude oil prices rose above $30, as the presidential election was scheduled in November of that year. Specifically, (1) actions were taken to encourage OPEC to increase production and stabilize crude oil prices at the General Meeting in March 2000 (by exerting political pressures), (2) a political decision was made to release the Strategic Petroleum Reserve (30 million barrels) in September 2000, and (3) it was decided to create North East heating oil reserve (2 million barrels) in July 2000.

In France and the United Kingdom, etc., petroleum products prices rose rapidly due to plummeting their currency rates against the US dollar and the existence of exorbitant oil-related taxes and tariffs, in addition to soaring crude oil prices. Protests and demonstrations by large oil consumers, such as freight and agricultural workers, included the blockading of roads and refineries and created serious shortages of petroleum products supplies in some regions. The governments of these countries were then forced to make certain political action or compromises to solve these problems, by proposing temporary tax relief and other measures, as they were scheduled to hold important national and local elections.

OPEC oil-producing countries, heavily dependent on oil income for their national economies, reinforced their unity through reforms of political relationships against the backdrop of the historically low prices that continued until the beginning of 1999, then implemented large-scale production cuts and succeeded in raising crude oil prices. In addition, in and after 2000, being aware of the negative effects of excessively high prices (weakened demand for OPEC crude oil), these countries increased production to stabilize crude oil prices. They have, therefore, implemented production adjustments with the strategic intention of stabilizing their own societal and economic structures (and current regimes).

As stated earlier, oil as a commodity is now listed on futures markets, and prices are determined through active trading in those markets. In this sense, it can be aptly argued that oil has become quite similar to an "ordinary commodity." However, actual prices are determined through various political

and strategic maneuvers. Specifically, as excessively high (or low) oil prices can have various political and geopolitical implications, a growing perception seems to emerge: "everything cannot be left to market for this commodity"[9].

10. Implications for Japan

Based on recent trends and the factors causing the soaring crude oil prices and huge price volatility after 1999, as stated above, the implications for Japan can be summarized as follows.

(1) Possibility of soaring crude oil prices and volatile fluctuations

Since 1999, crude oil prices have fluctuated significantly and, quite possibly, unstable price trends may continue, including steep rises. The reasons may be summarized as follows: (1) supply buffers to alleviate the effects of supply and demand changes, such as oil inventories, have been weakened; (2) the characteristics of price formation in oil futures markets as stated above exist; (3) price fluctuations that have continued so far may formulate and enhance subsequent price fluctuations; (4) there are major concerns on the strained Palestine situation and the possibility of U.S. attacks on Iraq; and (5) there is the possibility of price trends detached from actual supply and demand fundamentals being psychologically driven by the previous factor in (4). Because future developments cannot be predicted with certainty, it is crucial to analyze and follow up international conditions concerning oil market and price trends on a continual basis.

(2) Efforts required to prevent soaring prices and increase stability

Japan depends almost entirely on imports from the international market for her domestic requirement for oil. Even for natural gas (LNG), our import prices are often linked with crude oil import prices, and thus heavily affected by international oil market trends. Under these circumstances, it cannot be denied that violent fluctuations of crude oil prices (particularly skyrocketing prices) in the international market constitute a major threat to our energy and economic securities. It is therefore necessary to make strenuous efforts not only to analyze the international oil situation, but also to prevent the negative impacts of price increases and fluctuations on Japan and the world as a whole. Part of such efforts may take the form of actions to directly stabilize prices. In this regard, it will be necessary to take proper views and actions from the perspective of Japan's current position as the second largest oil importer and economic power in the world, after the United States. In addition, as economic globalization accelerates and as greater effort is required to enhance international competitiveness in

[9] Although they are outside of the scope of this report, geopolitical aspects of the oil market have recently attracted great attention. These include the American policy of oil embargo against Iran and Iraq and its impacts, the implications of the terrorist attacks on the United States and the associated "war against terrorism", the political tensions in the Middle East and its impacts, and the pursuit by China and other Asian nations of security of oil supplies.

increasingly severe economic environments, it will be necessary not only to consider how to cope with supply disruption or price hikes as an emergency measure or preventive action, but also to strive to secure oil at more reasonable and competitive prices under ordinary circumstances[10].

(3) Importance of collaboration in Asia and producer-consumer dialogue

To attain the above objectives, Japan will need to continue the energy security measures and policies it has so far undertaken domestically for the diversification of energy sources, energy conservation, and enhancement of oil stockpiles, but must also continue to promote international cooperation and dialogue. First, it will be important to promote cooperation with Asian countries which are now embarking on active energy security policy deployments, including construction of national oil stockpile facilities, etc., to counter the increasing dependency on oil imports. Second, more dialogue and discussion with oil producing countries (in particular in the Middle East) will be necessary to stabilize prices and establish more reasonable price formation processes in the international oil market. Through effective dialogue and discussion, we will need to seek more "fruitful" collaborations for the common interests of both oil producing and oil consuming countries. With regard to these two points, specifically for the stockpiling of oil, it will be necessary to examine the possibility of flexible use of oil stockpile for market stabilization. Namely, it can be important not only to enhance the stockpiles quantitatively, but also to seek more effective utilization of stockpiles so as to stabilize prices, for example, by releasing (or building) oil stocks flexibly to counter excessive price fluctuations, while considering the characteristics of the current international oil market and oil futures markets.

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[10] An important example may be actions against the so-called "Asian premiums" attached to crude oil prices.