

Global Focus on Knowledge/Winter Semester 2008

# Future Prospects of Crude Oil and Food Prices, and Japanese Economy

Lecture at The University of Tokyo (Ⅱ)  
(October 23, 2008)

Kazuo Iwata

President, Economic and Social Research Institute, Cabinet Office

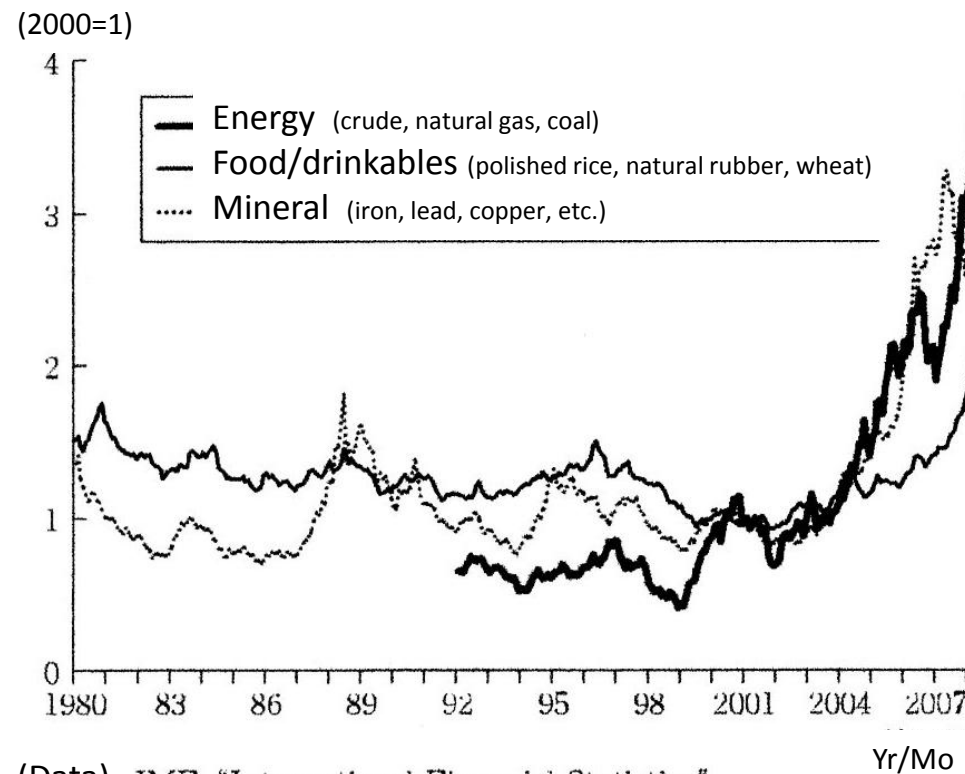
The figures, photos and moving images with ㊦marks attached belong to their copyright holders. Reusing or reproducing them is prohibited unless permission is obtained directly from such copyright holders.

# 1. Trend of Crude/Food Prices

- Prices of crude oil and mineral started climbing since around 2004, soared during these past 2-3 years, and subsequently went down. But they still remain at high levels.
- Food price shot up suddenly from around 2007 and fell off recently: (1) population growth, (2) upturn in the income level of emerging countries, (3) abnormal climate (e.g., a drought in Australia), and additionally, (4) large-scale consolidations of exchanges in recent years. The futures price of crude closely operates together with that of food.
- Soaring of the crude price, NASDAQ index during the bubble period, and American housing price resemble well in shape.

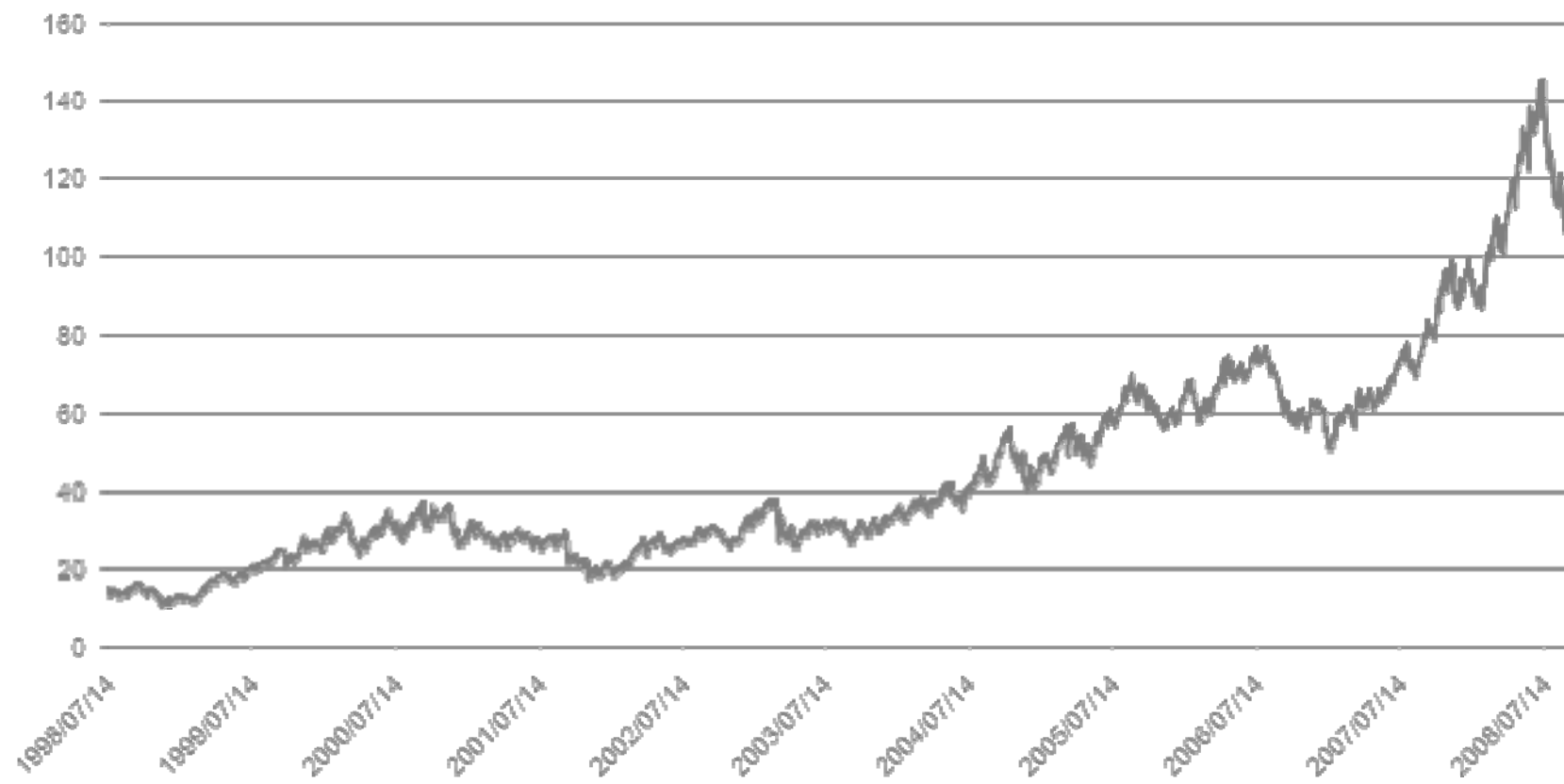
# (Chart 1) Pricing Trends of Energy, Mineral and Food

(Chart 1) Transition of Prices of Energy, Food/drinkables, and Mineral

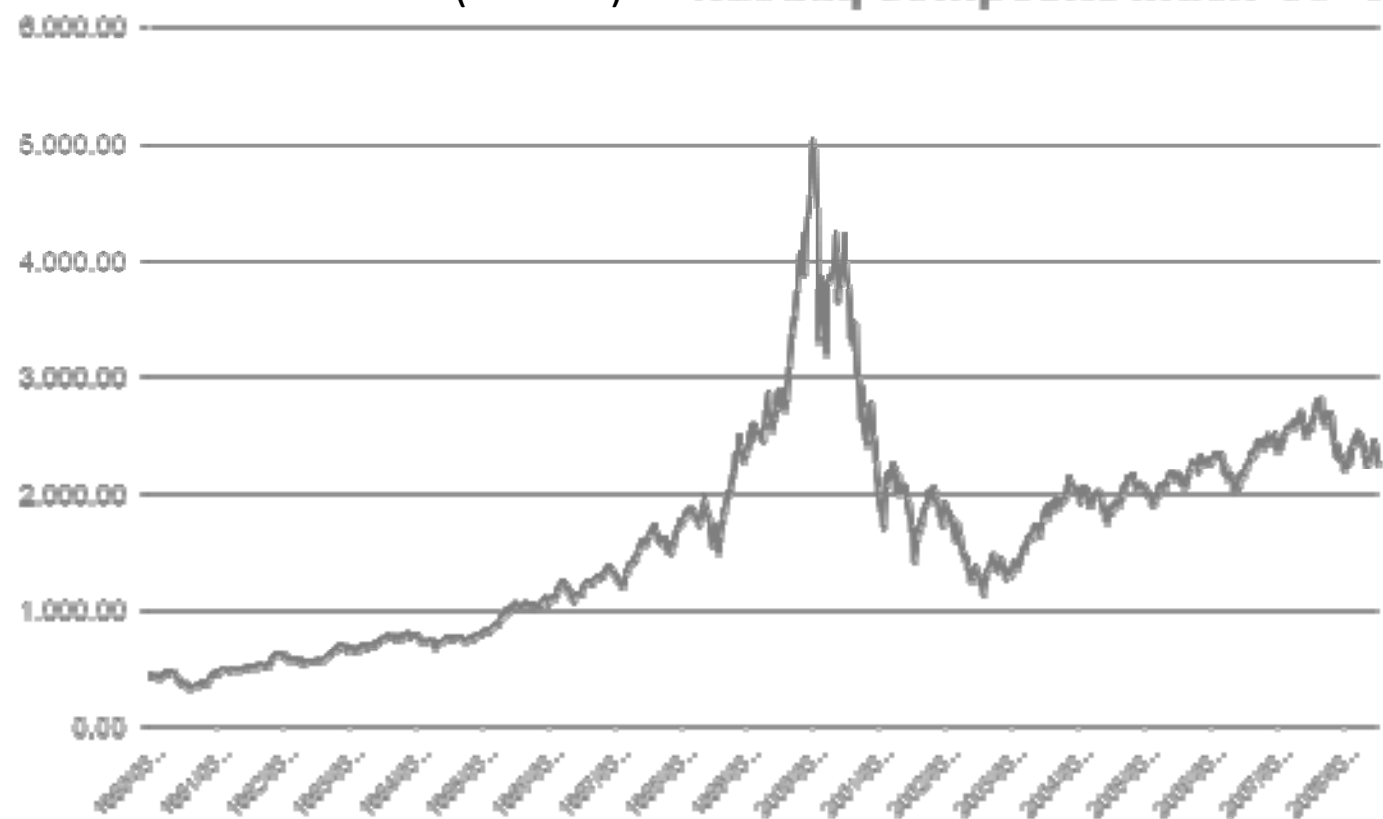


(Data) IMF "International Financial Statistics"

(Chart 2) WTI '98-'08



(Chart 3) Nasdaq composite index '90-'08



## (Chart 4) All in Bubbles

The picture inserted here removed  
due to copyright restrictions.

## 2. Factors in Steep Rise in Crude Price (I)

- (1) The swing of crude price until mid-2004 was attributable to a “genuine demand market” led primarily by demand (the rise of BRICS like China and India). As income elasticity of demand for oil is 3-6 times as large as price elasticity, the price hike is unlikely to curb the demand.
- (2) Since mid-2004, this has become a “financial market,” turning crude price into “liquid assets,” value of which is decided in futures market.
  - Investors’ urge to retain commodity futures gets stimulated by their earnings improvement with the diversification of retained assets through the investment in commodities including oil, and by the fact that the spare productive capacity of oil-producing countries (OPEC in particular) is limitative (passive long position).
  - Compared to the market size of WTI, a massive amount of investment funds flew into the futures market. Particularly commodity index fund rapidly increased since 2003: it trebled from \$70 billion in January 2006 to the excess of \$225 billion in the beginning of 2008. In addition, hedge fund transactions exert an impact on short-term variability.

## 2. Factors in Steep Rise in Crude Price (II)

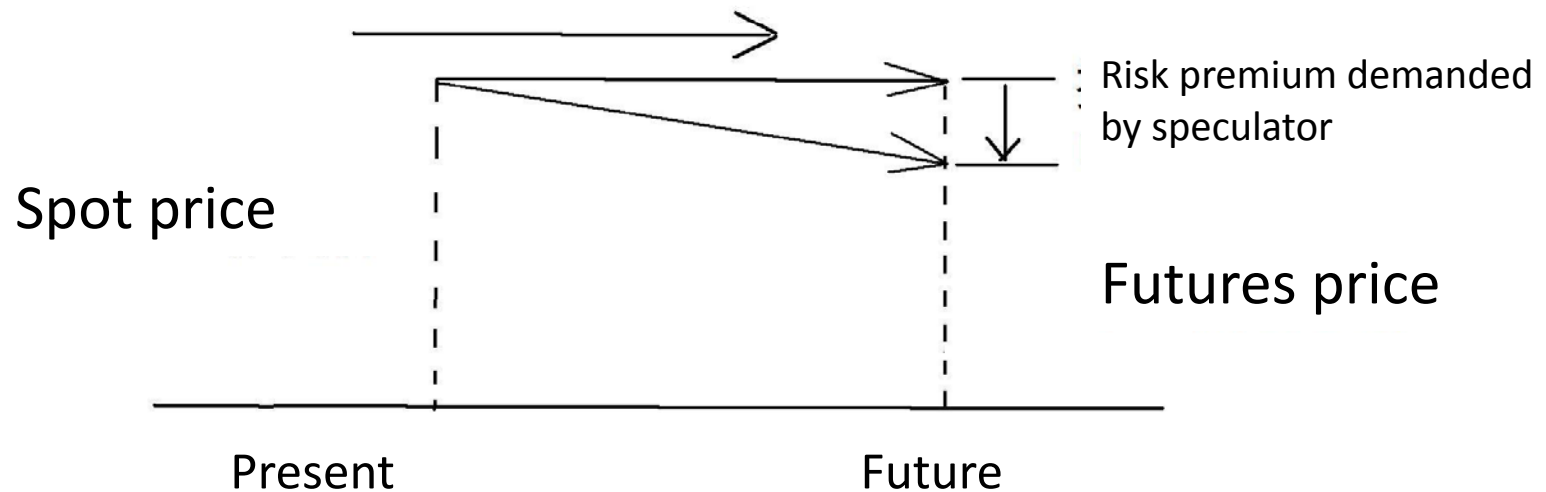
- As a result of the money inflow into futures market, a contango market (futures price  $>$  spot price: regular spread) emerged since February 2005. Normally it ought to be backwardation (futures price  $<$  spot price: reverse spread).
- For instance, a producer of rice, in an attempt to hedge a risk in the price fall at the time of rice harvest sells rice in futures market (purchasing an insurance), and a speculator purchases this futures (providing an insurance). At this time, the speculator demands a risk premium in return for his bearing of the risk of a price fluctuation in the future. This premium equals the increment of spot price over futures price (Keynes=Hicks).

$$\text{Spot price} - \text{Futures price} = \text{Risk premium}$$

## (Chart 5) Is Reverse Spread Normal?

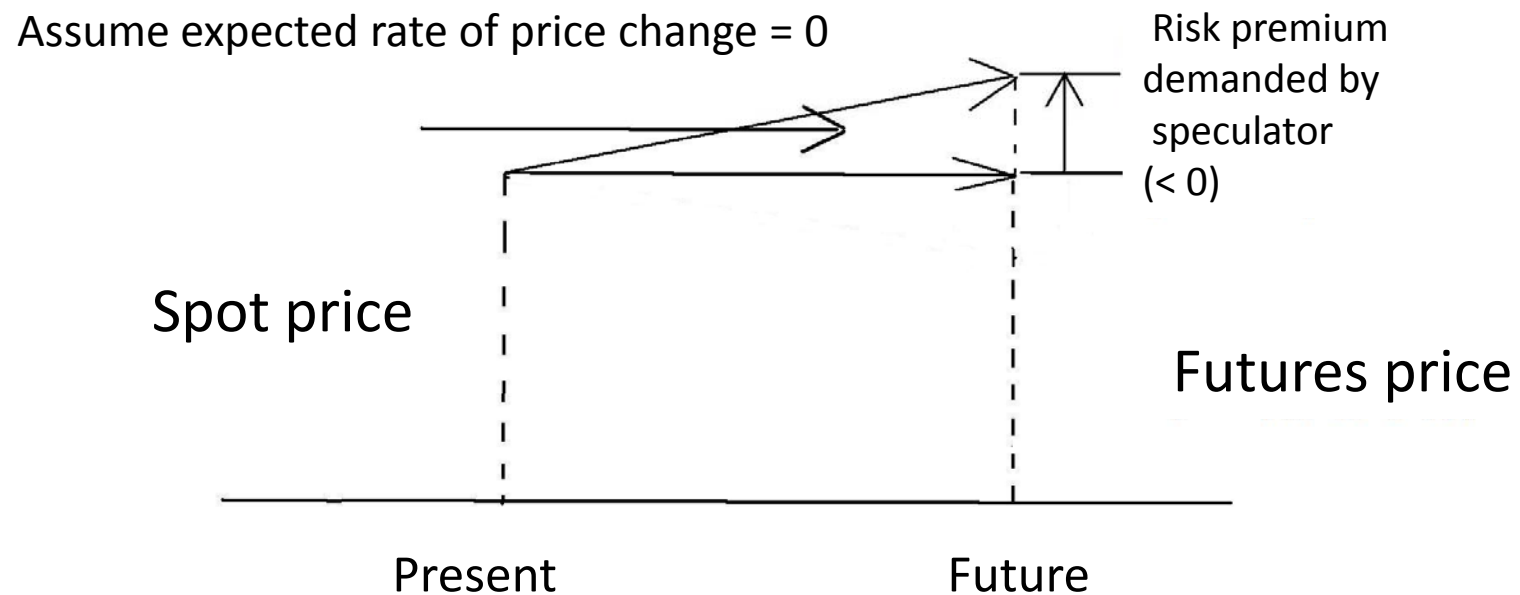
backwardation

Expected rate of price change = 0



## (Chart 5) Reverse Spread (contango)

contango



## 2. Factors in Steep Rise in Crude Price (III)

—On the other hand, from the perspective of retaining crude inventory, in light of the cost to retain inventory and convenience yield, depending on sizes of an interest rate, retention cost and convenience yield, both regular spread and reverse spread can be explained (Kaldor's stock thesis).

Futures price — spot price = marginal stock cost— convenience yield by stock retention (a formula to be read as the definition of convenience yield)

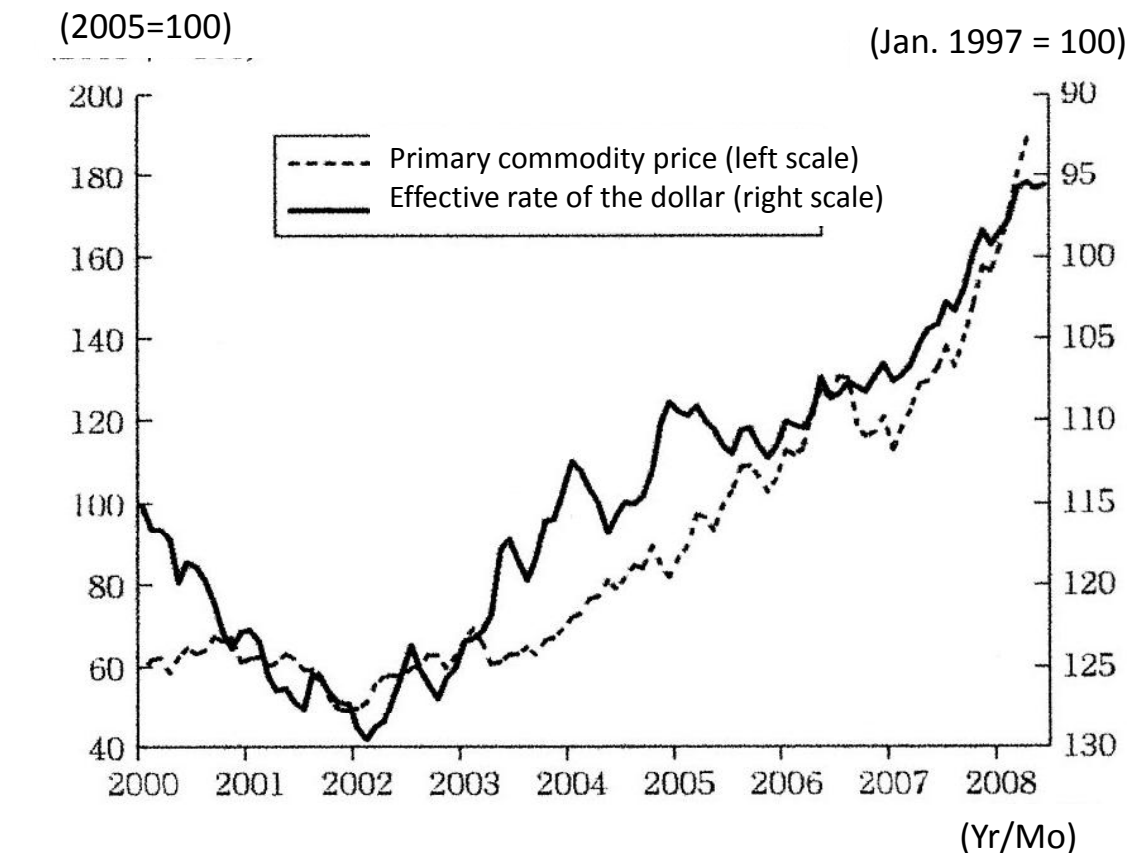
—Ex-chairman Greenspan stated that because the futures price climbed (contango) in February 2005 only to build up inventory, an “enthusiastic price hike” would be held back in the end. Nonetheless, partly because the inflow of funds into crude futures market continued without interruption, it was not until mid-2007 that the higher futures price came to be corrected. It has been in regular spread again since the end of May 2008 and crude futures price peaked out in July.

## 2. Factors in Steep Rise in Crude Price (IV)

- Whereas, with an idea that the storage buildup would lead to the price reduction, OPEC considered the restriction of output necessary.
- (3) After 2007 the movement to “Flight to simplicity” grew stronger, and since January 2008, owing to hatred toward the dollar and American financial policies, crude price kept on climbing rapidly.
- Under President Carter silver price shot up from \$5 in 1979 to \$50, and silver became a “hard asset” replacing dollars (“Hunt Silver Crisis”). With a raise in warranty money, it went down in excess of 50%.
- Just like silver of those days, crude has become a “hard asset” replacing dollars and continues to rise in price like bubble irrespective of genuine demand.
- To evaluate the oil price with the price of gold, it is at the level of the first half of the 1970s.

# (Chart 7) Destination of Flight from Dollar

(Chart 12) Transition of Effective Rate of Dollar and Price of Primary Commodity



(Data) US FRB "Federal Reserve Bulletin" — —

† Japan Research Institute's Research Eye dd. 6/10/2008,  
The Japan Research Institute, Limited

## 2. Factors in Steep Rise in Crude Price (V)

—Meanwhile financial institutions expanded transactions on derivatives which led to an escalation of volatility. Amid the oil price increase, airline companies bought call options (right to purchase assets in the future) and cut back on fuel costs; financial institutions that sold these call options bought crude in futures with the purpose to hedge risks of said sales (delta hedge), thus accelerated the price hike of oil. Conversely by selling forward to hedge their sales of put options (right to sell off assets in the future) to oil producers (delta hedge), these institutions enlarged the range of price reduction during September 2006 through early February 2007.

(4) Made-in-America theory: in addition to the policy of monetary relaxation to stabilize financial system

—President Bush's speech in January 2006 to the effect to cut back on the degree of dependence on Middle Eastern crude oil by 75% suppressed the interest in investment to increase production of crude among Saudi Arabia and oil producing countries in Middle East.

—In the U.S., a proposal was made by President Bush in January 2007 that biofuels would grow 5 times by 2020 and that the use of ethanol should be 20% of gasoline by 2017. EU targets at substituting 10% of gasoline by 2020, but Prime Minister Brown wishes for a reconsideration of this objective.

## 2. Factors in Steep Rise in Crude Price (VI)

- Strategic storage buildup in August 2007. President Bush announced in January 2007 to raise the stockpiling target from 690 million BD to 1.5 billion BD, and in August the U.S. doubled its purchase volume. (China increased the stockpiling too.)
- Also in August the country resumed the stockpiling of sweet crude oil, which induced WTI hike at least by \$10; it's possible that derivative instrument trades by financial institutions amplified the upward swing.
- In addition, in January 2008 Department of Energy announced to double the share of sweet crude oil against the strategic storage buildup.

Furthermore,

- Tightening of regulations (low sulfur content) for environmental protection also suppressed motivation to invest in oil resource development and refining.

## 2. Factors in Steep Rise in Crude Price (VII)

(5) Although the peak oil thesis does not apply since drilling for oil is possible more than 40 years (30 years in the 1970s), gasoline's production and refining reserve have been declining.

—Because of an emergence of resource nationalism (70% of deposits owned by state-run oil companies) and a trend toward nationalization, an upper limit of the production is set at 95 million BD. Backward-bending supply curve might be the case.

—Deterioration of refining facilities in the U.S. and the lack of investment in Russia.

—Geopolitical risks have been amplifying investors' anxiety in the supply. (With light gravity and low sulfur content, Nigeria's crude fits well to gasoline, but liberation campaigns take place there.)

## 2. Factors in Steep Rise in Crude Price (VIII)

(6) The steep rise in WTI gasoline price was also affected by a change in the oil market structure centering on light-gravity and low-sulfur crude.

–The market size of sweet crude oil (sulfur content of less than 0.5%) is small at 5—20 million BD, most of which is produced under long-term contracts. For the sake of strategic stockpiling the U.S. applies purchase in kind to the royalty income derived from crude development in Gulf of Mexico, thus the supply volume to the market becomes less by that much.

–The shortage of gasoline refining facilities (majority unable to handle Middle Eastern crude) and decrease in gasoline inventory in the U.S. While heavy-gravity oil can be easily substituted, medium- and light-crude products are mainly for the transport sector's use and it requires a long time to substitute them. The demand for low-sulfur gasoline and diesel by the environmental policy makes it difficult to substitute sour crude oil for sweet crude.

–This is an epoch of “energy gridlock” where funds do not extend over an investment in prospecting, because, for one, oil majors have become specialized in high-grade products being away from all-round manufacturers and for another, they now emphasize dividends and short-term stock prices (share buyback) due to the change in corporate governance.

(7) Price control over petroleum products in emerging nations

–Gasoline in China and Indonesia is about half the price in Japan. The subsidy in India has escalated as much as to 3.8% against her GDP. Owing to the added burden on the national treasury, there emerges a movement to raise prices of petroleum products (in Indonesia, etc.).

### 3. Effect of Steep Rise in Crude Price (I)

- (1) In oil-importing nations, as terms of trade worsen due to a surge in the import price of oil, which transpires the transfer of real income offshore, domestic price hike, and strain on corporate earnings, their domestic demand grows stagnant.

In case of Japan, the recent overseas transfer of real income amounts to 4–5% of her real GDP, being bigger than that in other foreign countries. Owing to the worsening of corporate earnings, nominal wage per capita declined centering around nonmanufacturing industry and small and tiny companies.

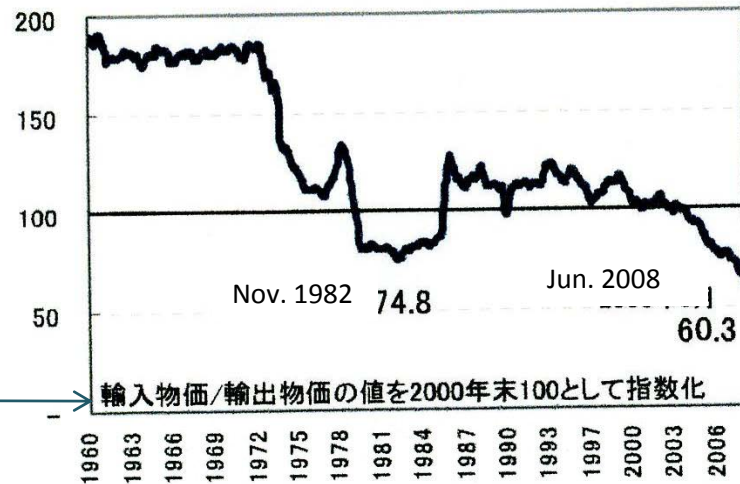
In Europe, there is a risk that the rise in energy price might trigger the secondary price hike through the wage increase.

The U.S. suspended the rate-cut cycle inasmuch as the easing of money would cause depreciation of the dollar and increase prices of crude and food, which would bring about price hikes in import and domestic commodity that would end up giving a negative impact on personal consumption.

- (2) Oil-producing countries enjoyed the boom on domestic demands thanks to the improvement in terms of trade (more than 10% of real GDP).

# (Chart 8) Worsening of Terms of Trade and Its Magnitude

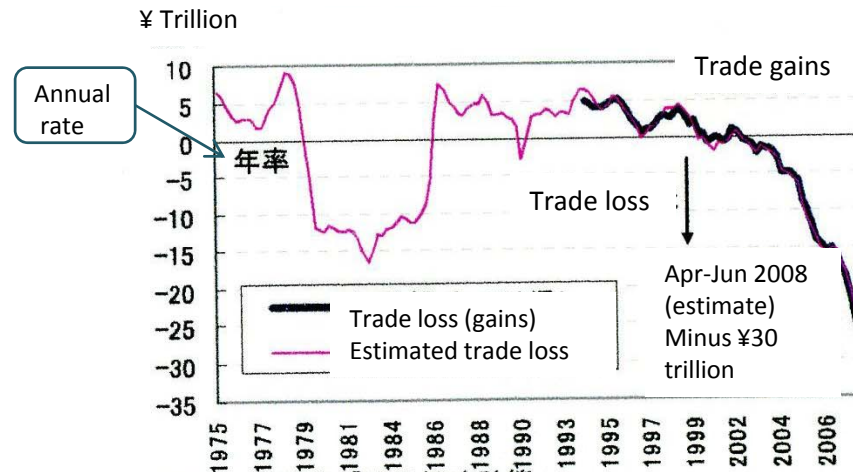
Data 1 Transition of Import-Export Trade Terms



(Origin) Bank Of Japan, *Corporate Goods Price Index*

Indexed against the value of import price/export price in 2000 year end as 100

Data 2 Transition of Loss in Trade



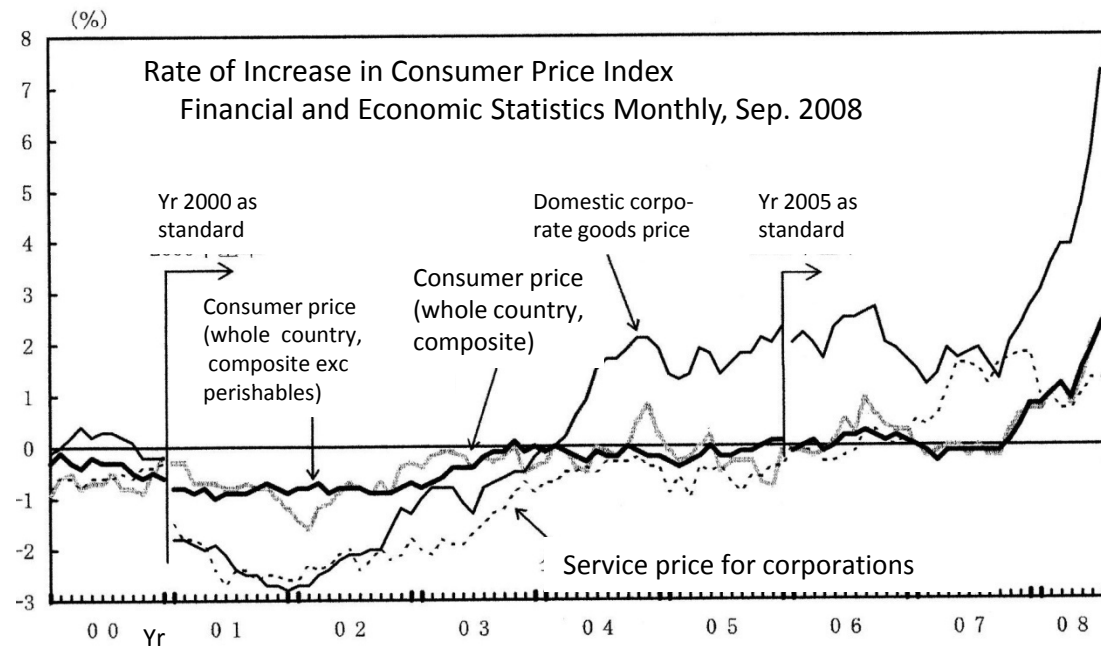
(Origin) Cabinet Office, *National Economic Accounting*

Estimates sourced from Dai-ichi Life Research Institute

Report of Dai-ichi Life Research Institute dd. Sep. 2008

† Date of Dai-ichi Life Research Institute Inc.

# (Chart 9) Upswing in Japan's Commodity Price



- (Notes) 1. Consumer price in (1) has been calculated with X-12-ARIMA.  
 2. Domestic corporate goods price in (1) excludes the effect of summer- season extra charge on power bill applied in Jul-Sep every year.  
 3. Until Yr 2000 in (2), each has been calculated based on Yr 1995 as standard. Domestic corporate goods price and consumer price until Yr 2005 have been calculated based on Yr 2000 as standard.

(Data) Ministry of Public Management, *Consumer Price Index*; Bank of Japan, *Corporate Goods Price Index, Whole Sale Price Index, Corporate Service Price Index*

### 3. Effect of Steep Rise in Crude Price (II)

(3) Substitution of energy source with biofuels (including ethanol, cellulose decomposition) is causing the price hike of food (wheat, corn, sugarcane) and cut back on forest resources.

—Nonetheless, substitution with bio-energy is limitative with some 2–4 million BD in another 10 years. Also there is a disparity between domestic and foreign prices of ethanol with the domestic production at ¥100 per litter and the import price at ¥40.

—Steep rise in energy and food prices awake social unrest and political uncertainty in emerging countries and developing nations. In addition to droughts, epidemics, and cyclone damage, food price has been influenced by American measure supporting biofuels of corn. In Vietnam an inflation rate soared 27% and in oil-producing countries inflation is growing worse with an additional reason of the peg to the dollar.

—China and South Africa proclaimed not to use corn as a basic ingredient of biofuels.

## 4. Future Prospect of Crude Price

### Short-term projection

- (1) On genuine demand side, when the slowdown in growth rates of the world economy is long in span of time and deep in downturn, such will be a factor in the lowering of crude price.
- (2) In financial sphere, if the termination of the U.S. rate-cut cycle and reversing of funds, attributable to slowdown in credit impairment, should happen, such will be a tentative factor in the lowering of crude price.

### Scenario A

American business tends upward from the latter half of 2009 and returns to her potential growth-rate course. Crude price goes down tentatively with the reversing of funds but gets back on a rising trend again.

### Scenario B

The U.S. economy, with prolonged settlement of subprime credit problems, maintains L-shaped shallow collapse till 2009; FRB cannot lower the interest rate due to inflation worries; crude price continues on an unstable path between the eased money policy, the dollar depreciation, and business gridlock (\$70–150 a barrel).

### Scenario C

Business recession of the U.S. economy becomes substantial and the world economy's growth slows down, resulting in a decline in crude price (\$50–70).

There is a great likelihood of Scenario B to C (G3, G7 recessions), and a reverse oil shock after the 2nd oil crisis is possible too. (Crude price went under \$10 in 1986.)

### Medium- to long-term projection

The price is on a rising trend because of supply constraints on crude oil derived from investment shortages, resource nationalism, risks in geopolitics and natural disasters. (In 2012–13 “the epoch of constrained supply” will come to light.)

## 5. Response to Steep Rise in Crude Price (I)

### (1) In the area of financial policy

- Against the worsening of terms of trade, to choose a “channel of a policy interest rate” so as to minimize deviation from a desired standard of the gap between the future inflation and GDP (optimum policy management). This however depends on the assumption of the accurate knowledge about a weight decision on two objectives and sensitivity level as to changes in GDP gap of inflation.
- Amid the lowering of market liquidity and dysfunction of money market (TED spread), it is impossible to discontinue liquidity supply for maintaining the stability of financial system. A problem remains to be the inflow of funds into commodity market (negative feedback).

### (2) A bill is being submitted to the U.S. Congress to watch and restrict big investors' investment in commodity market. Raising warrant money is an effective policy.

## 5. Response to Steep Rise in Crude Price (II)

- (3) It is important for an energy policy to resolve the future supply constraint caused by an investment shortage, and to recover a balance of supply and demand for a medium-and-long term; in the light of issues of global warming, the following out to be factored in as well:
- To establish an energy-saving society
  - To disseminate technologies/facilities for collection and retention of carbon dioxide
  - To develop second-generation biofuels and substitution energy that don't compete against food (promotion of technological innovation for atomic power and new energy, hydrogen energy)

Additionally;

- For the U.S. to discontinue the purchase of strategic storage and break into the reserve. (discontinued the buildup for the year in May 2008)
- To reduce geopolitical risks (peace keeping in Middle East)

## 5. Response to Steep Rise in Crude Price(III)

- (4) To make a business chance out of the steep rise in crude price
  - Oil sand (5 trillion barrels centered on Canada)
  - Dissemination of hybrid cars (from nickel hydride battery to lithium hydride battery)
  - Historically, energy conversions from wood to coal and from coal to oil have taken place long before reserves run out (Greenspan).

As for food, plants that are harvested on commercial basis are limited, and wheat, rice, corn, potato, and soybean occupy half the food produce (vulnerability of the supply structure). “Second-phase green revolution,” genetically-modified crop (soybean and corn, etc.); as there remain safety issues, an effective use of a genetic selection technology can be considered as this emphasizes biodiversity.