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Proposal on Measures for Reducing Asian Premium of Crude Oil

-- Changes in Pricing, Unity among Consuming Countries and Preparation of Oil Market --

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1. The Existence of Asian Premium and Its Impact

Fig. 1 Movements of AL Formula Prices

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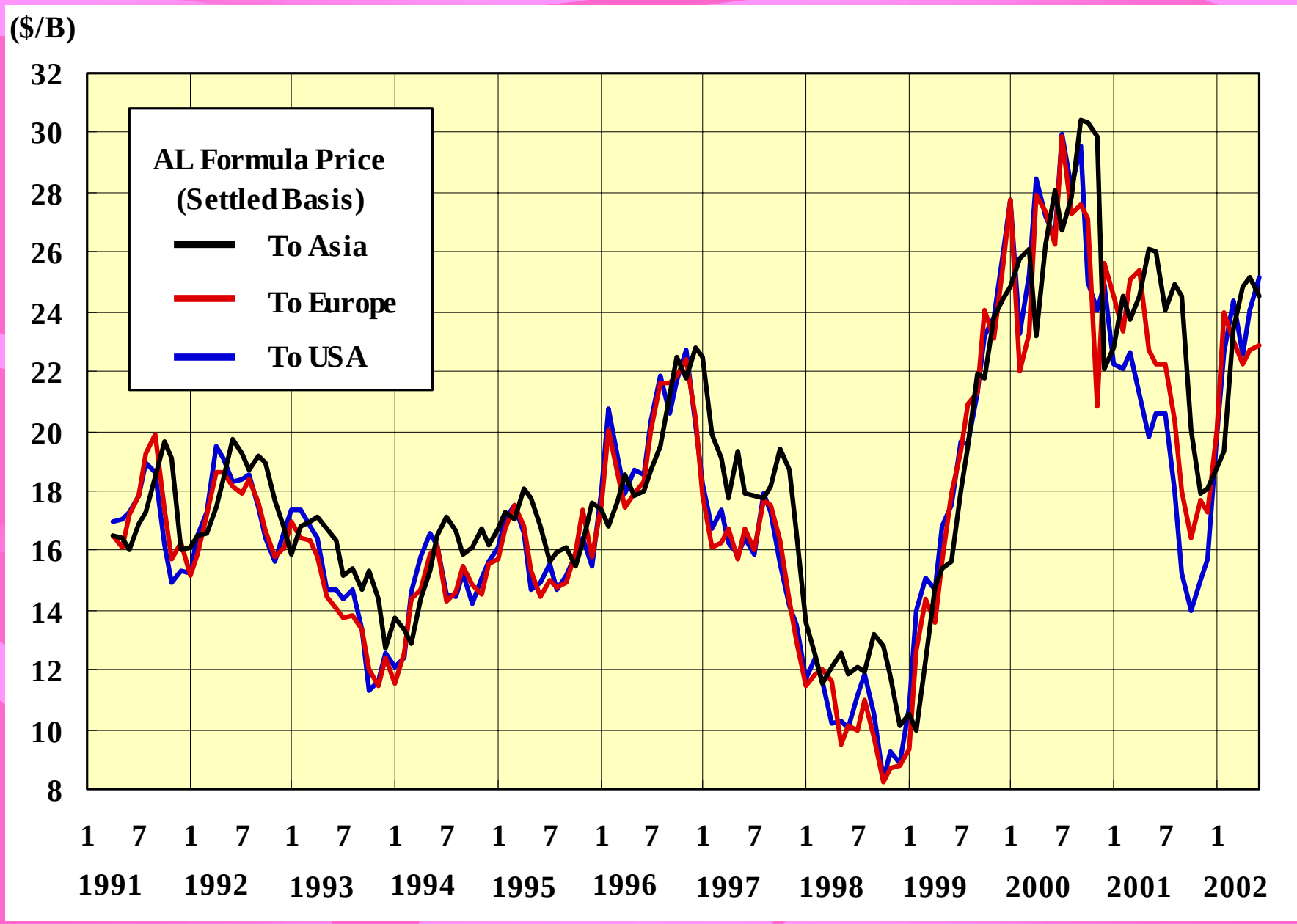

Fig. 2 Movements of Asian Premium of Crude Oil

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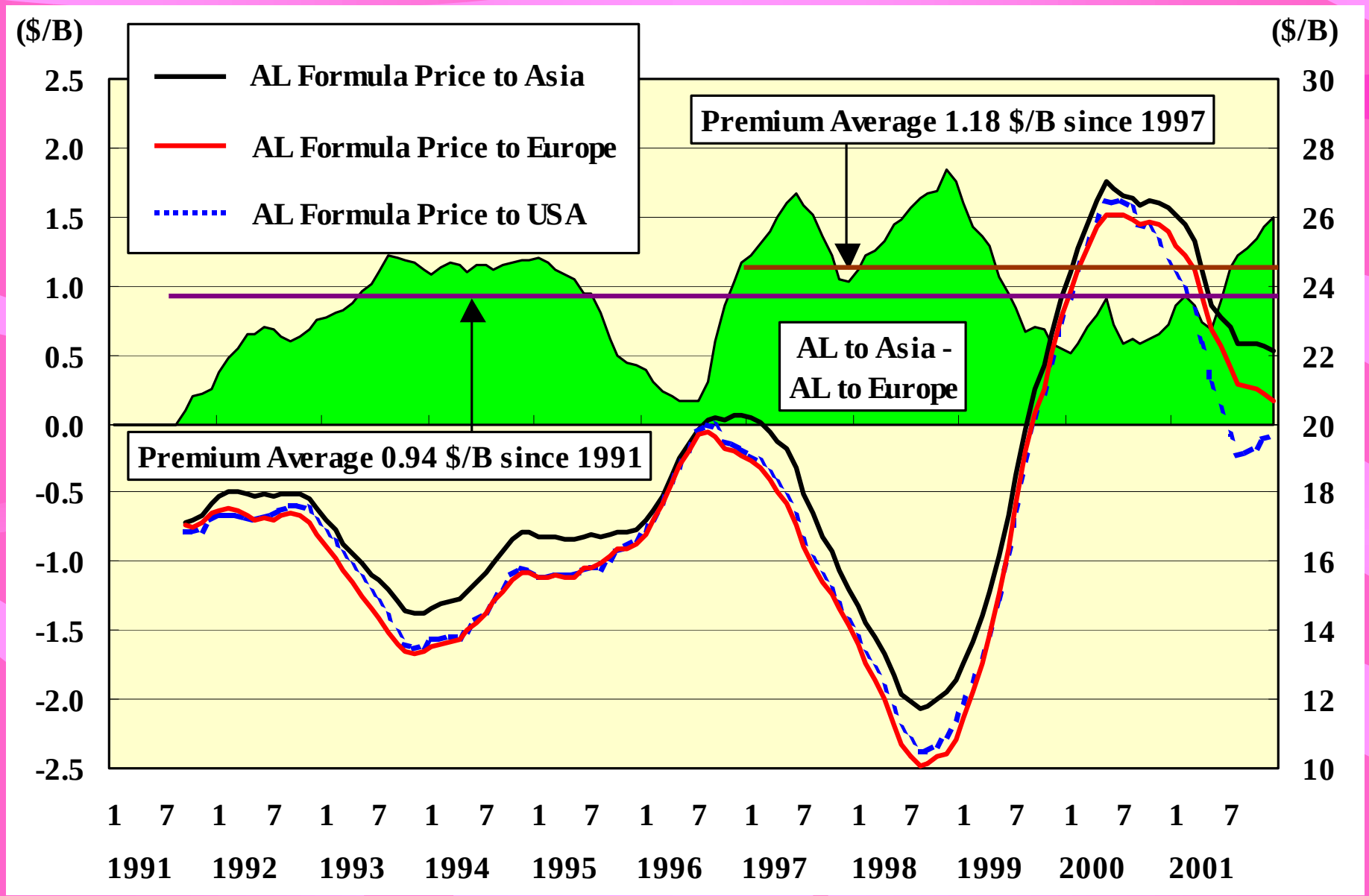

Asian Premium Fixed in Long Period

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- **Average premium 0.94$/B at long-term from 1991 to 2002**

  # Continuation of premium more than 10years

  # Premium reduced only in pricing rising stage of 1996

- **Recent clear signs for intentions of oil producing countries to keep premium**

  # Expanding to annual average 1.5$/B in 1997 and 1988

  # Keeping about 1$/B in price rising stage from 1999 to 2000

  # Expanding again from 2001 to 2002

Fig. 3 Aggravation of Refinery Margin in Singapore (Arabian Light)

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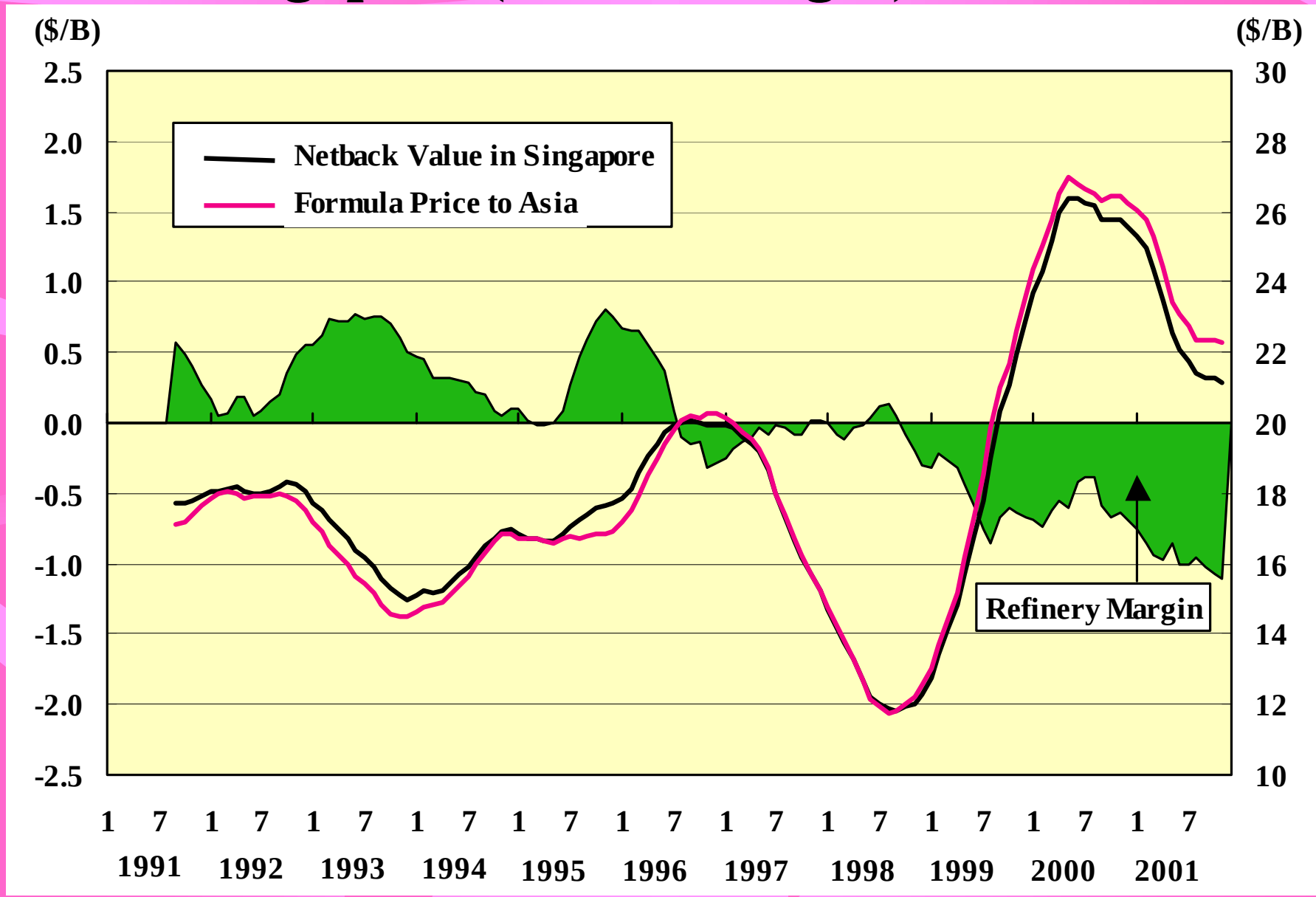

Fig. 4 Income Transfer due to Asian Premium

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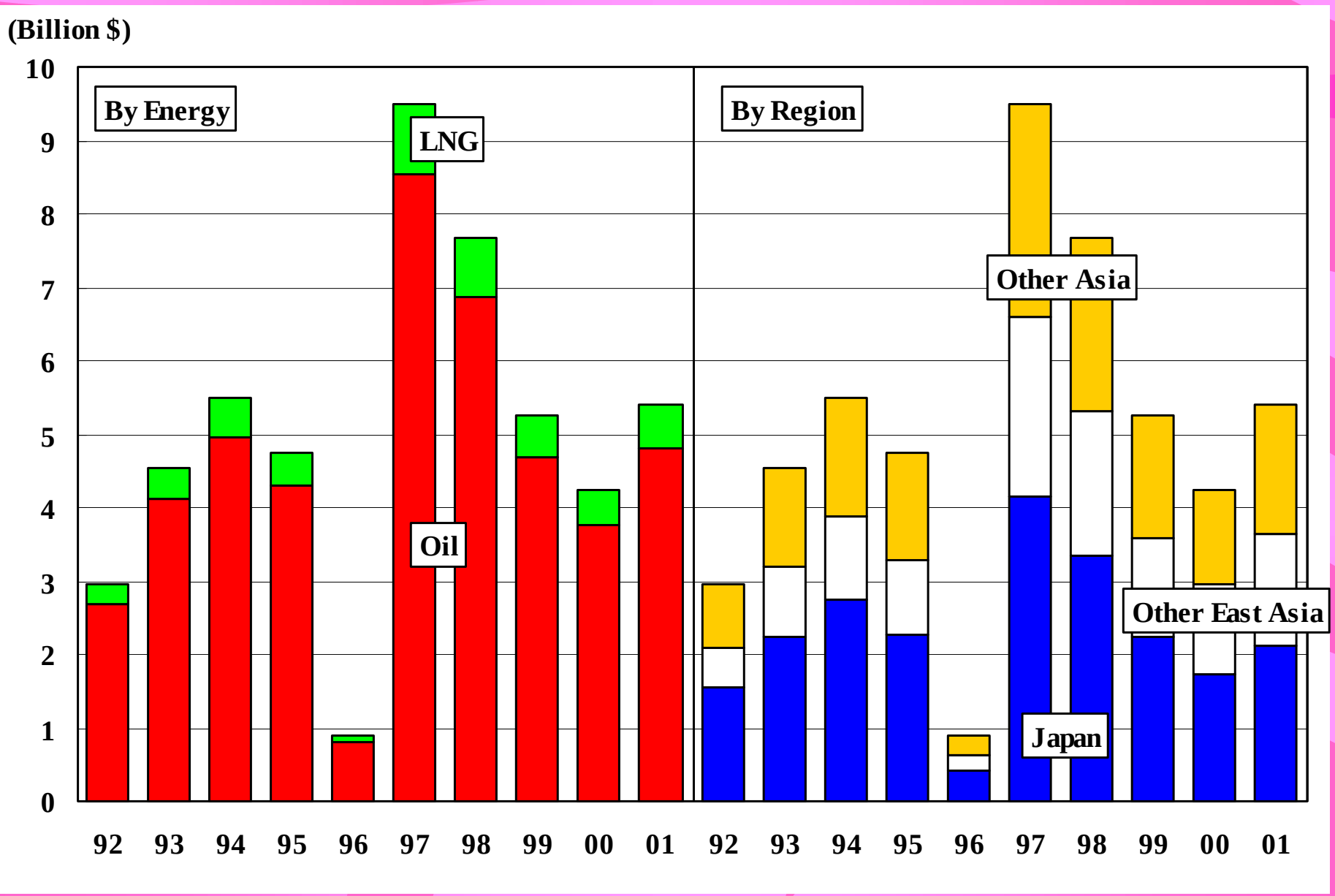

Fig. 5 Asian Premium of LNG

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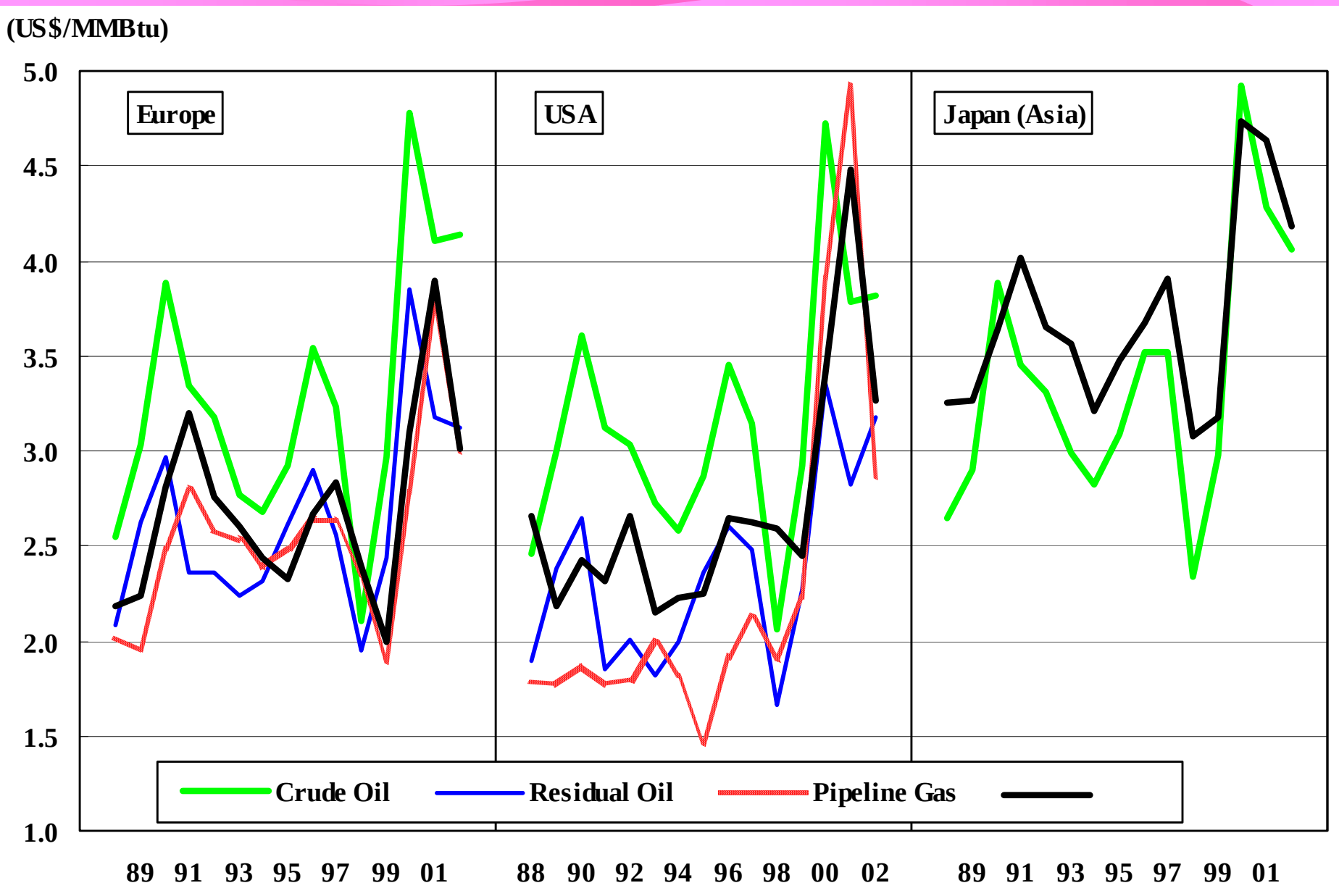

Fig. 6 Ups and Downs like Emergency Time LPG Contract Price

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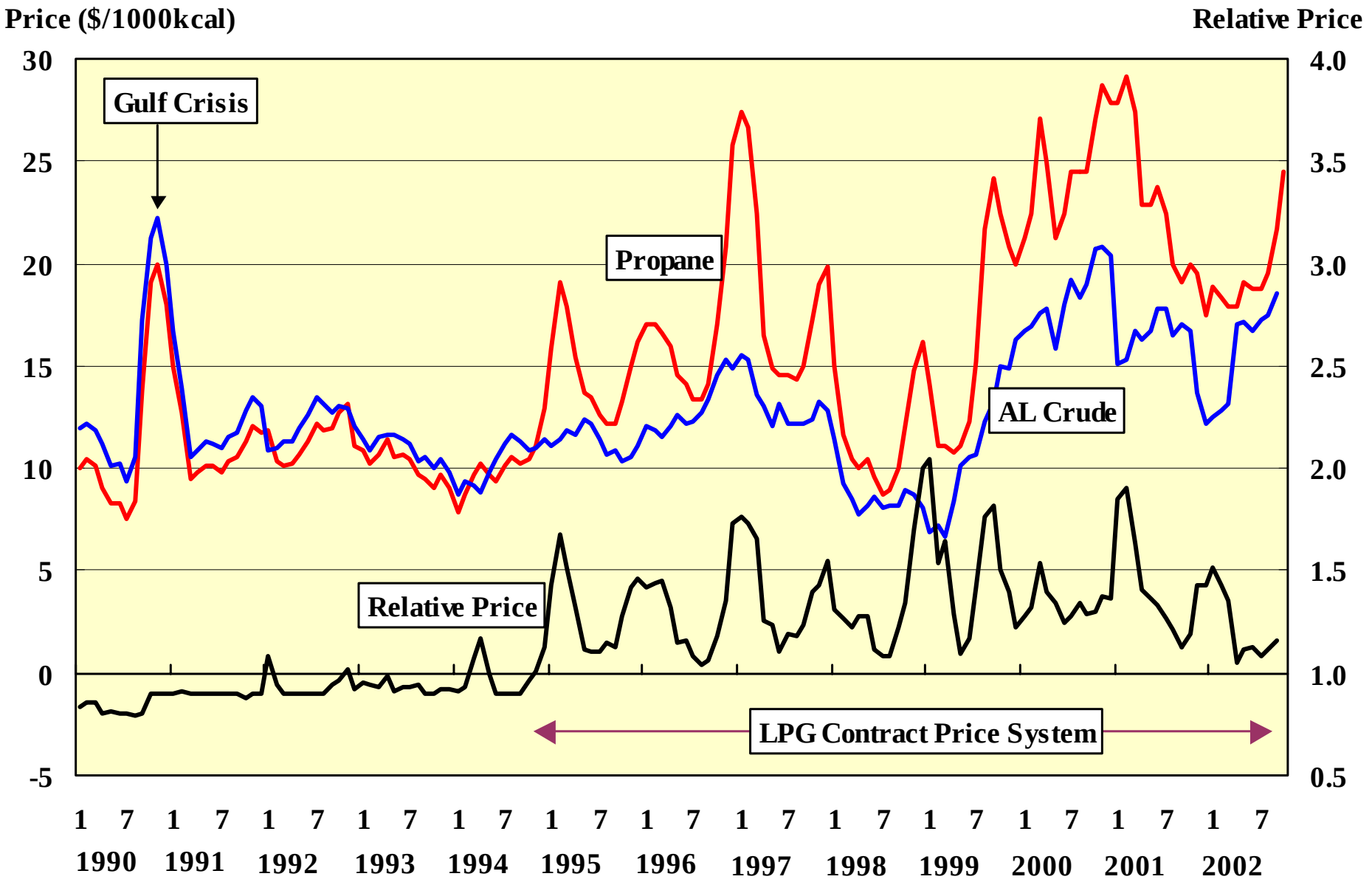

Asia Premium Having Large influences to International Competitiveness in Economy

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- **Additional income transfer of 5 to 10 billions $ from Asian consuming countries to oil producing countries**
- **Worsening refinery margin since 1999—recently expanded to minus value of about 1S/B**
  - **# reducing refinery margin due to demand slowdown and surplus refining capacity since 1997**
  - **# minus refinery margin due to higher crude oil price since 1999**
  - **# lowering refinery operation in Singapore, Korea and so on**
- **Asia Premium is not limited to oil but exposed on whole energies**
  - **# Price of other energies such as LNG is raised through crude oil price**
  - **# LNG has an original problem for Asian premium**
  - **# LPG contract price showing ups and downs like emergency time – one-way force by producing countries**

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2. Dubai Production Decrease and Necessity of Marker Crude Change

Pricing Formula of Crude Oil and Its Components

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$$P_{\text{(selling crude)}} = P_{\text{(marker crude)}} \pm (a_{\text{adjustment factor}})$$

- Marker crude price is determined in the spot or future market
- Adjustment factor is originally determined by oil producing country watching competitive conditions in the market
- Necessary to examine the relation between both terms
- Necessary to consider the difference in referring timing of marker crude oil price

Fig. 7 Asia Premium Continuing about 10 Years

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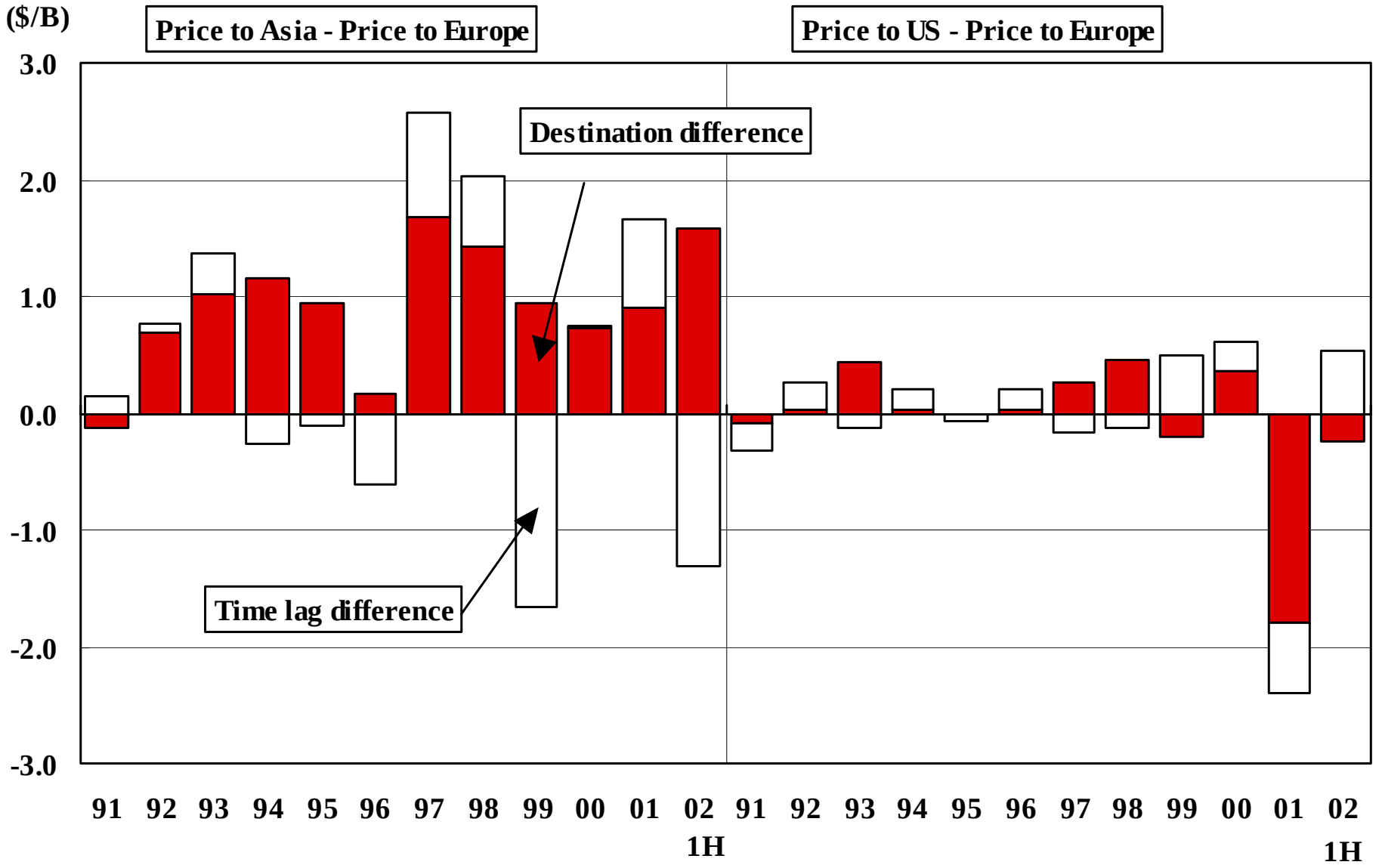

Fig. 8 Difference between Marker Prices and Difference between adjustment factors

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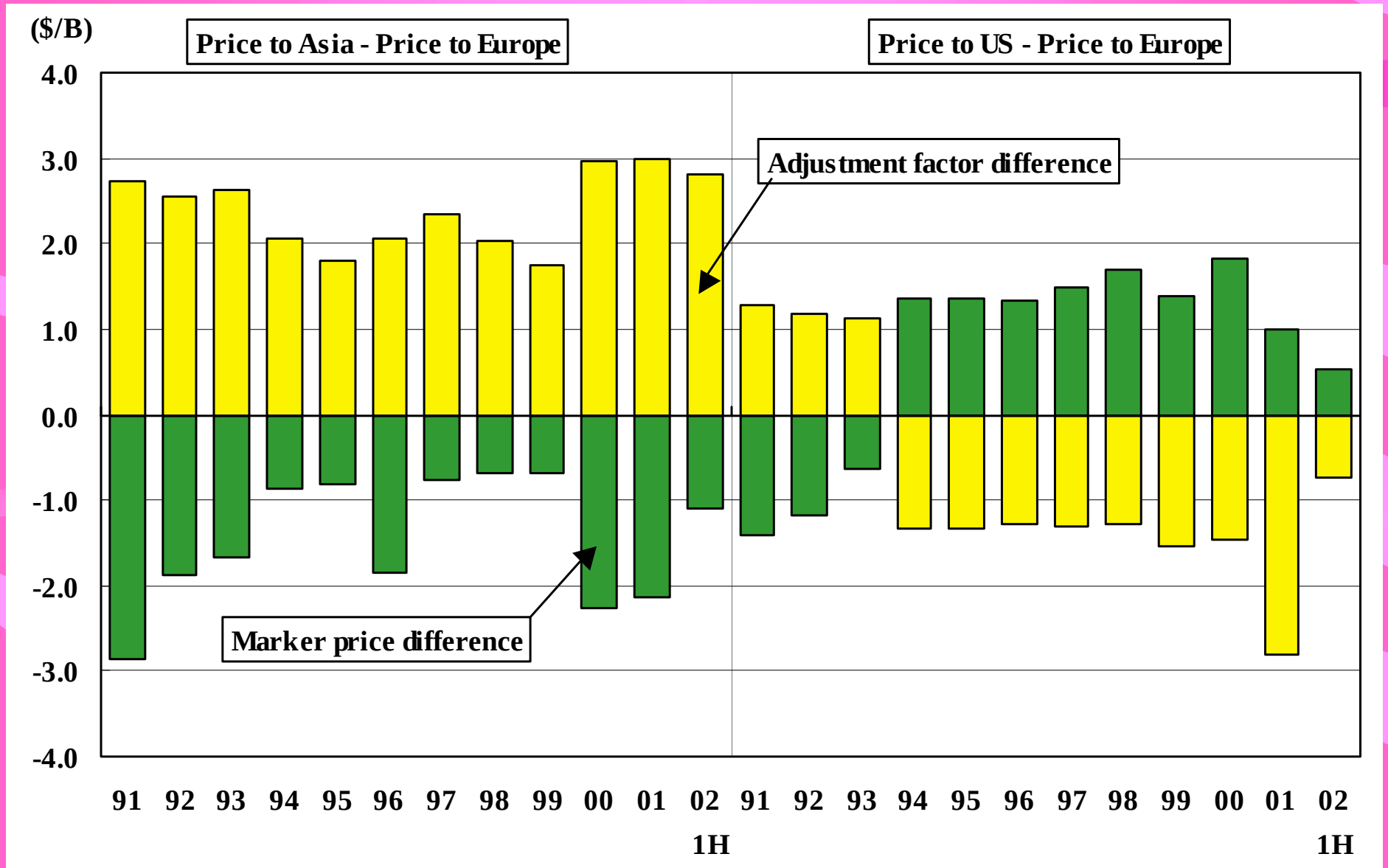

Production Decrease in Dubai, Marker Crude for Asia and the Points at Issue

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- **Production decrease to 150,000 B/D in 2002 from 420,000 B/D in 1987**
  - # Steadily decreased Entering 1990s and accelerated since 1995
  - # Crude destination was limited to Asia since1991
  - # Rapid decrease in spot trading, Special buyers by bidding
- **Dubai price formation completely losing reliability**
  - # Low liquidity and transparency in spot price formation
  - # Assessment of Dubai price using Brent price and spread between Brent and Dubai
  - # Quotation price by Platt's considering spot and future
  - # problem of intentional price manipulation using defects of physical trading

Adjustment Factor Set by Middle East Oil Producing Countries and Its Components

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$$a \text{ (adjustment factor)} = Q \text{ (quality difference with marker crude)}$$
$$+ T \text{ (transport cost to consuming area)}$$

- **Oil producing countries determines adjustment factors intentionally or considers competitive conditions of crude oil in the market?**
- **Two factors in the case of judging market competitive conditions**

 # quality difference between selling and marker crude in the concerned market

 # Transport cost from ME oil producer to the concerned market (consuming area)

Fig. 9 Adjustment Factor for Europe and Its Components

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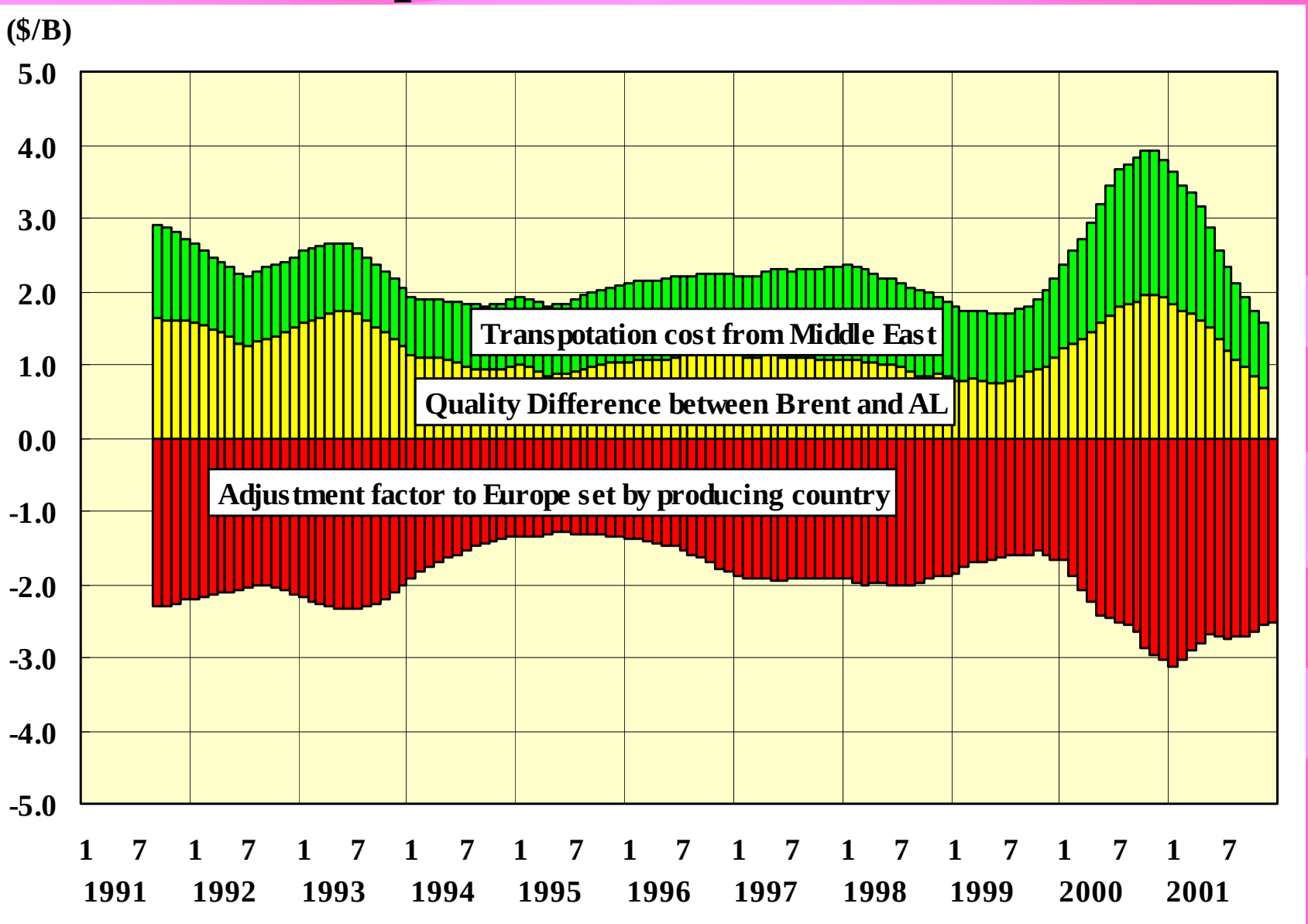

Fig. 10 Adjustment factor for US and Its Components

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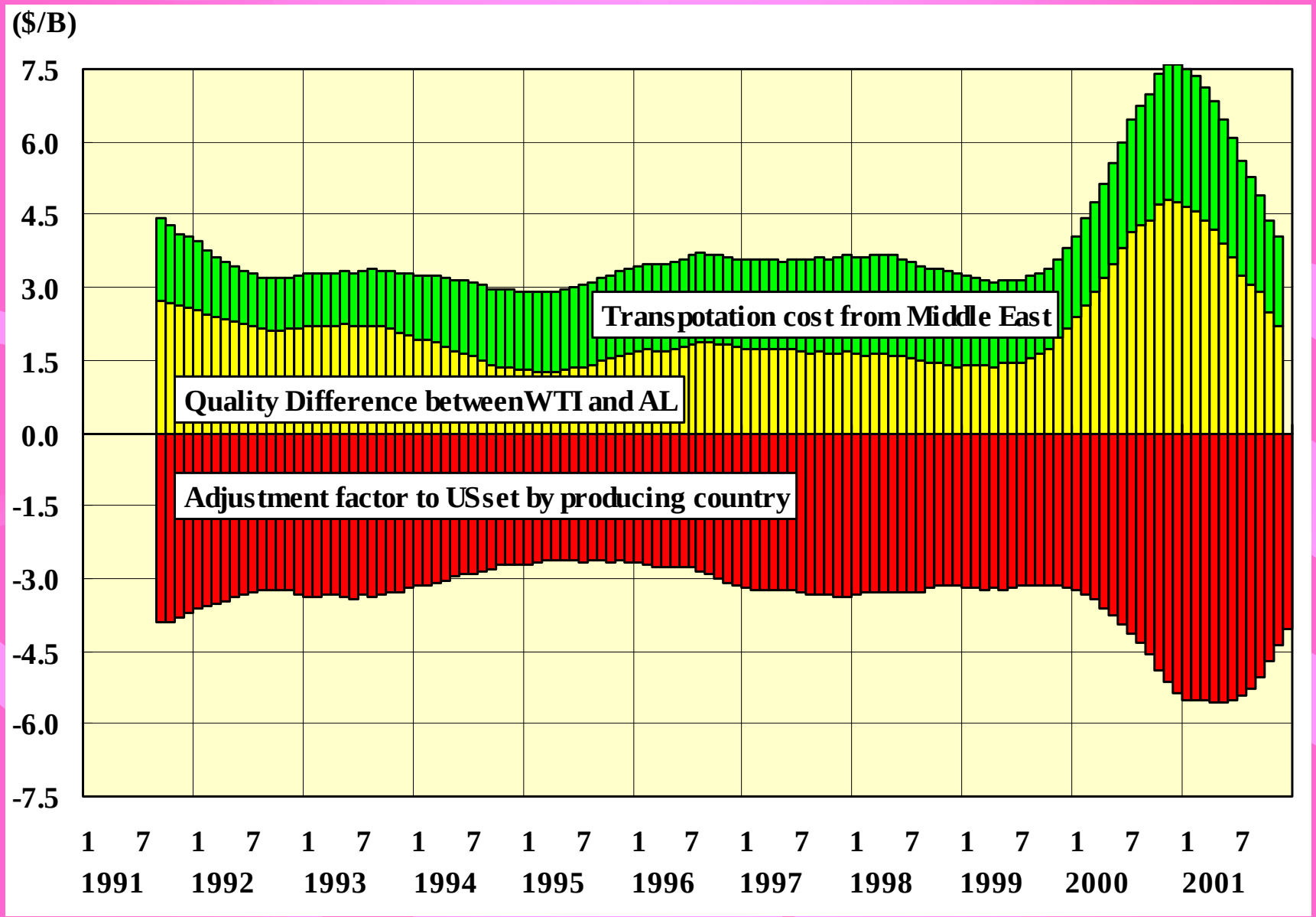

Fig. 11 Adjustment Factor for Asia and Its Components

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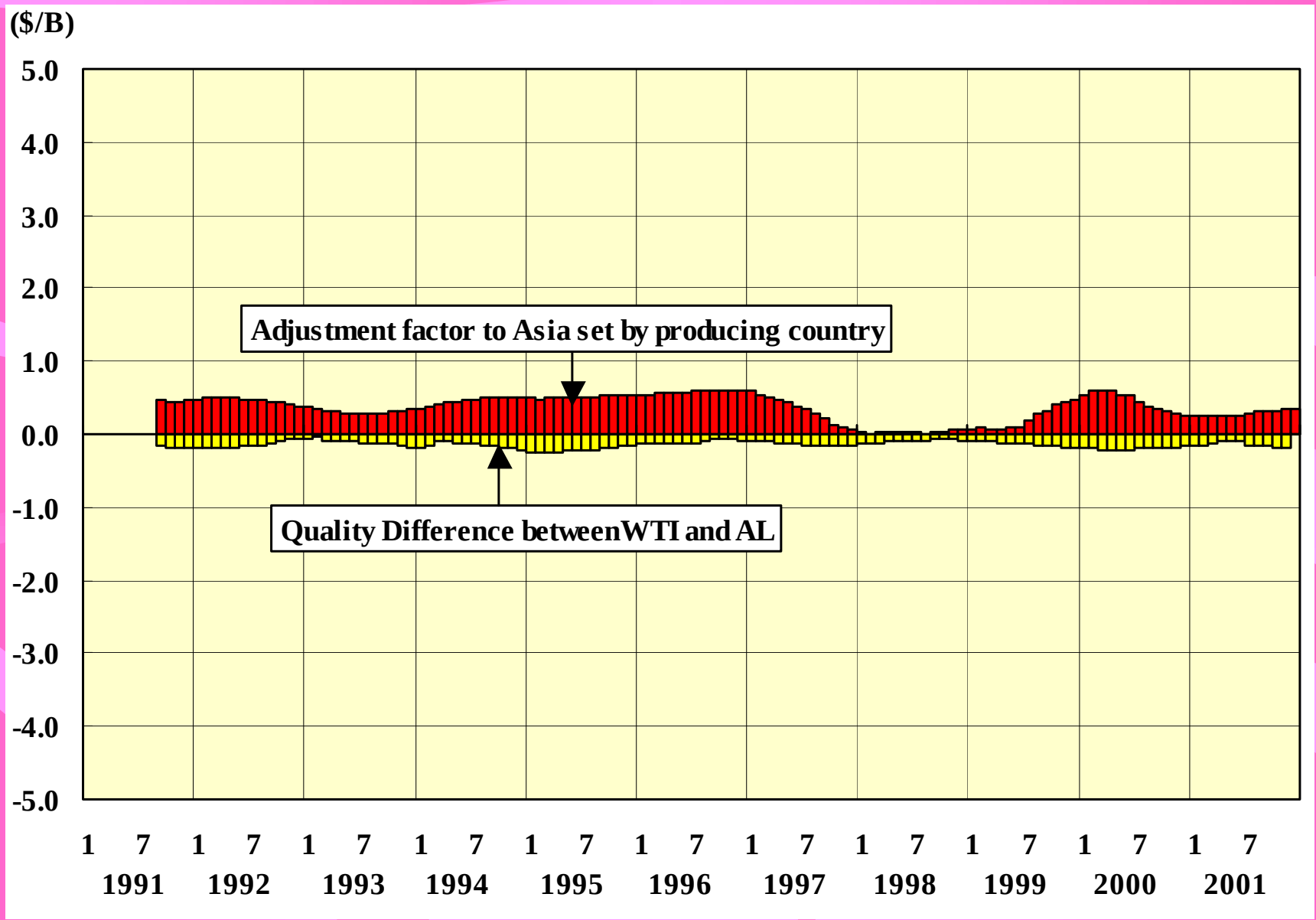

Viewpoints on Crude Oil Price Level in Asia

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One-way forced price by producer

Situations which consumers should avoid with first priority

Competitive level with alternative crudes in Asia

Competition between ME and African, North Sea crudes

Price set up by producers through considering competitive conditions in the market

Situations which consumers should effort to reduce premium

Level where FOB price at delivery point in ME producer are consistent among consuming areas

Crude oil price level which is not a handicap for Asia in international competitions of economy is required – Issues which ME producers should also consider

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3. Change of Pricing for Asia and Reduction of Premium (Short-term Measures)

Short-term Measures for Reducing Asian Premium

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1. Procurement Expansion of Alternative Crude Oil from Areas besides Middle East

2. Changes in Pricing for Asia such as Changes in Marker Crude

Fig. 12 Import Expansion of African and North Sea Crude Oils

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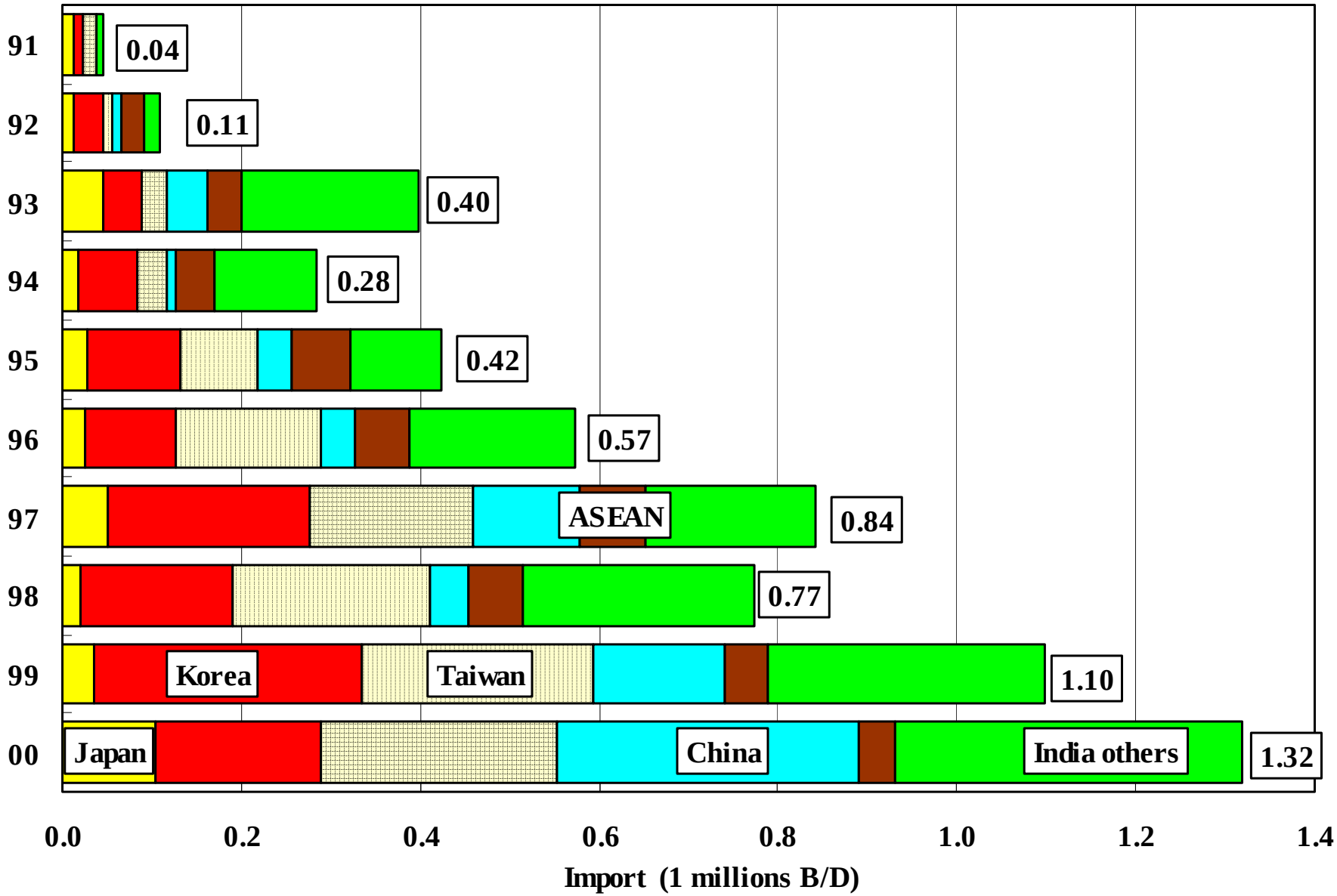

Procurement of African and North Sea Crudes and Its Problems

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- **Procurement Expansion of African and North Sea Crudes in 1990**
  - # In Korea and Taiwan, expanded due to the strengthening of sulfur regulations in diesel oil and residual oil -- Desired postpone for full-scale introduction of desulfurization
  - # In China, expanded due to refinery limitation with pursuing crude similar to domestic one
  - # In ASEAN and India, expanded due to insufficient clacking with pursuing lighter crudes
  - # These crude oils is needed even if price is higher than ME crude oils
- **Problems for procurement of African and North Sea Crude**
  - # Not work effective because of limited amount possible to procure
  - # Necessary measures to compensate higher cost of long distance transport
  - # Necessary ship allocation due to the small size of each oil field

Not be effective measures in short-term, considering these points

Table 1 Alternative Candidates of Marker Crudes for Asia

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Alternative Candidates	Strong/Weak Points
Idealistic crude	
Daqing crude	● Although China is a large consumer market, the oil market is under administrative control and is not free. ● Spot exports are limited and the market is localized, ruling out dealings with U.S. and European traders. ● Greatly differ in properties from Middle Eastern crude oil.
Arabian light	● Large in production scale, allowing trading on a global scale. Can represent M.E. crude for Asian market. ● Saudi Arabia bans spot trading to keep prices from falling. Destinations for exports are restricted. ● Saudi Arabia monopolizes sellers' market.
Price index for M.E. crude	● It is necessary to expand oil products trading in East Asia and streamline spot trading market. ● It is necessary to streamline products futures trading market and to post price index for M.E. crude. ● Streamlining of various aspects is necessary, making its immediate realization difficult.
Realistic crude	
Oman	● Spot trading to some extent already exists. Larger in production scale than Dubai crude. ● Shell holds 40 percent concession interests, leading to apprehension of price manipulation by Shell.
IPE Brent	● Large-scale trading in international market. High liquidity of market and high transparency of prices. ● Having marker crude in common, the verification of price differentials for European market becomes easy. ● Price fluctuations reflecting supply and demand in U.S./European markets constitute new risks. None of actual trading in Asian market.,

Proposal (1) for Pricing Change for the Sake of Reducing Premium

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- **Pricing Based on Brent Crude Price (Marker)**

P (Selling crude) $= P$ (IPE Brent) $\pm a$ (Adjustment Factor)

a (Adjustment Factor) $= Q$ (Quality difference between selling crude and Brent by Singapore Assessment)

$+ T$ (Transport cost from Middle East to Northeast Asia)

- **The Main Points for Pricing Proposal**

To adopt IPE Brent Price as a global common standard

To assess quality difference between selling and Brent crudes at the Singapore market

To consider transport cost from Middle East to Northeast Asia

Fig. 13 Assessment of Quality Difference at the Singapore Market

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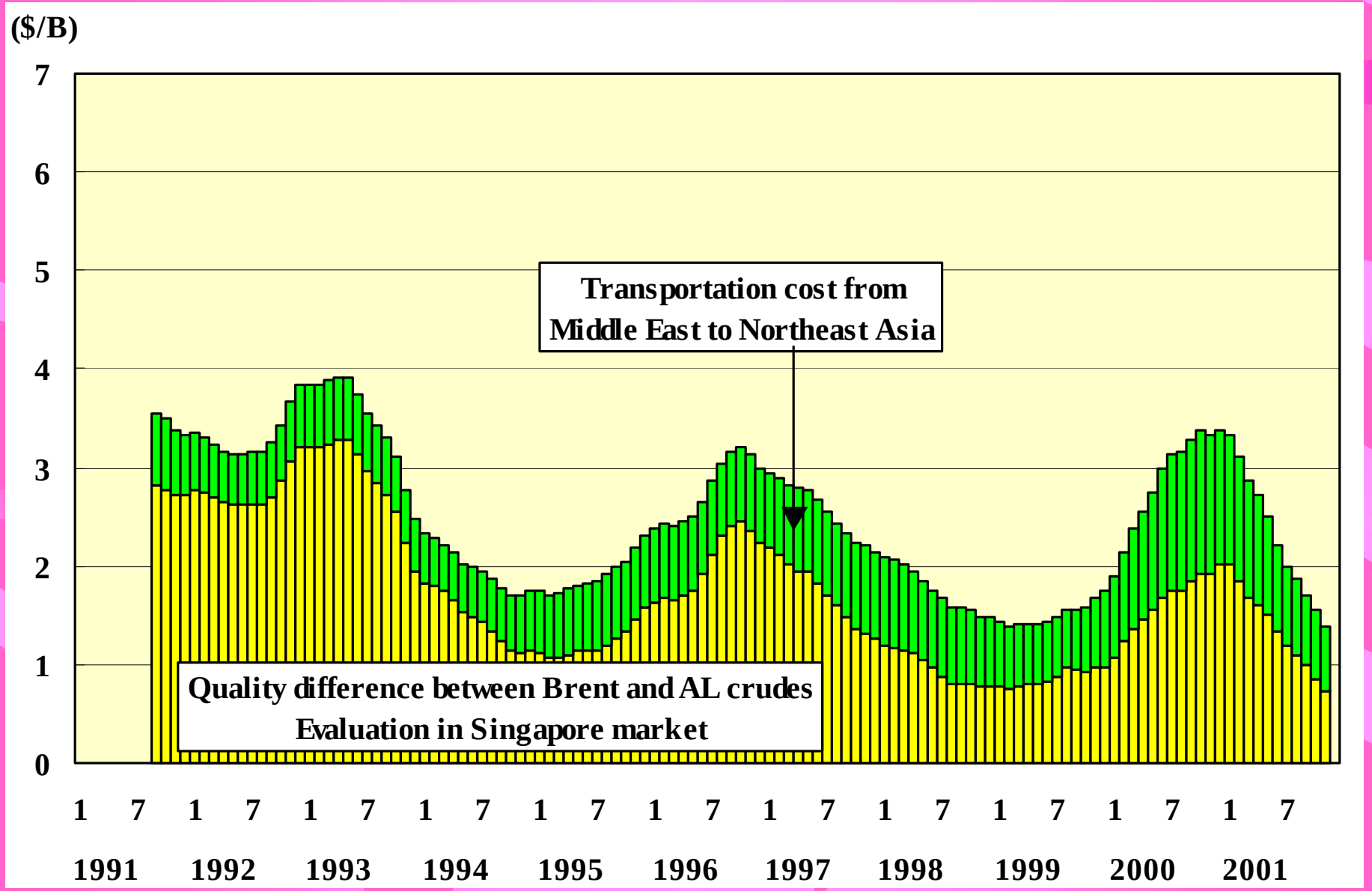

Fig. 14 Proposal (1) : Pricing Based on Brent

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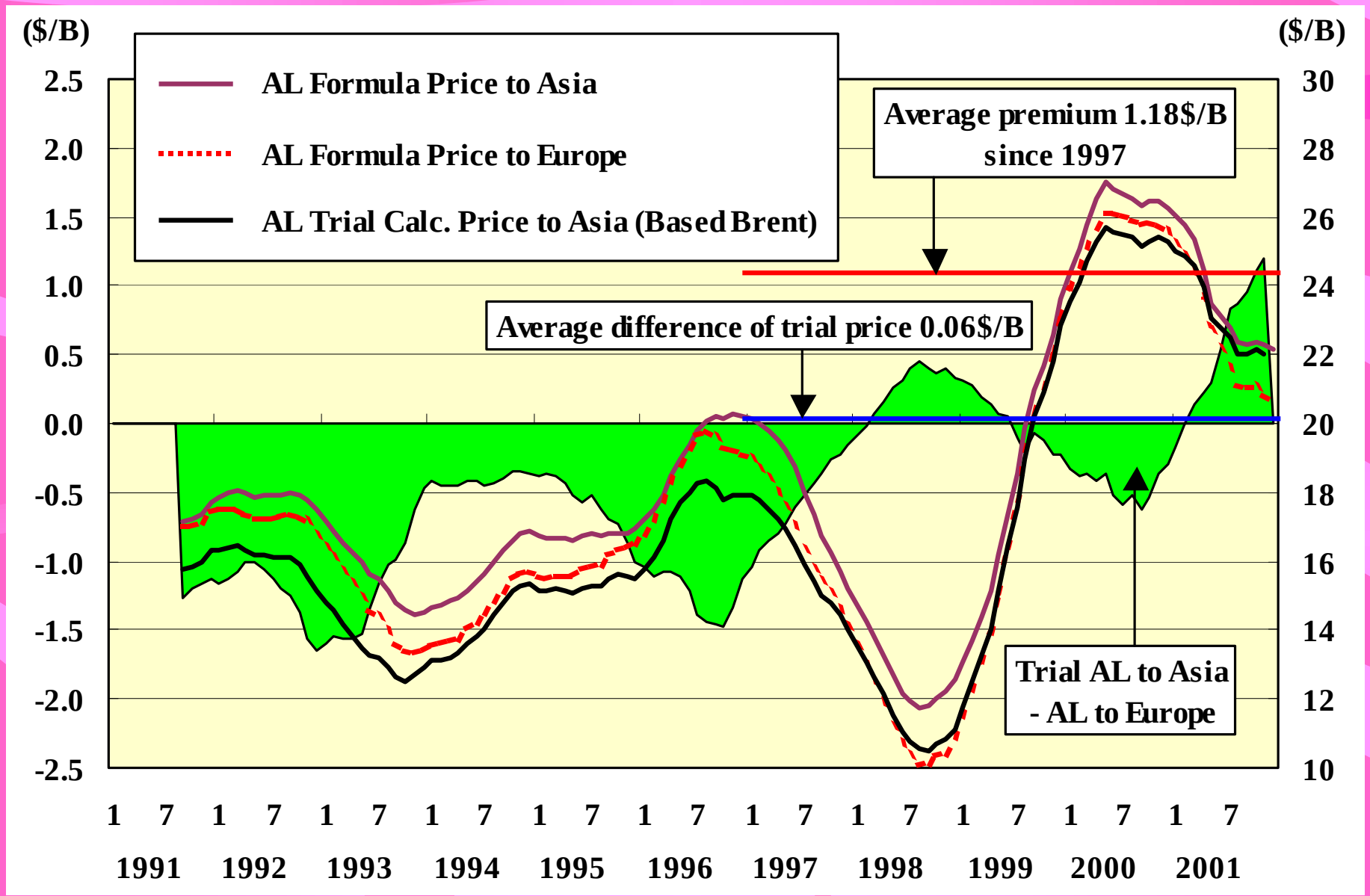

Fig. 15 Improvement of Refinery Margin in Proposal (1)

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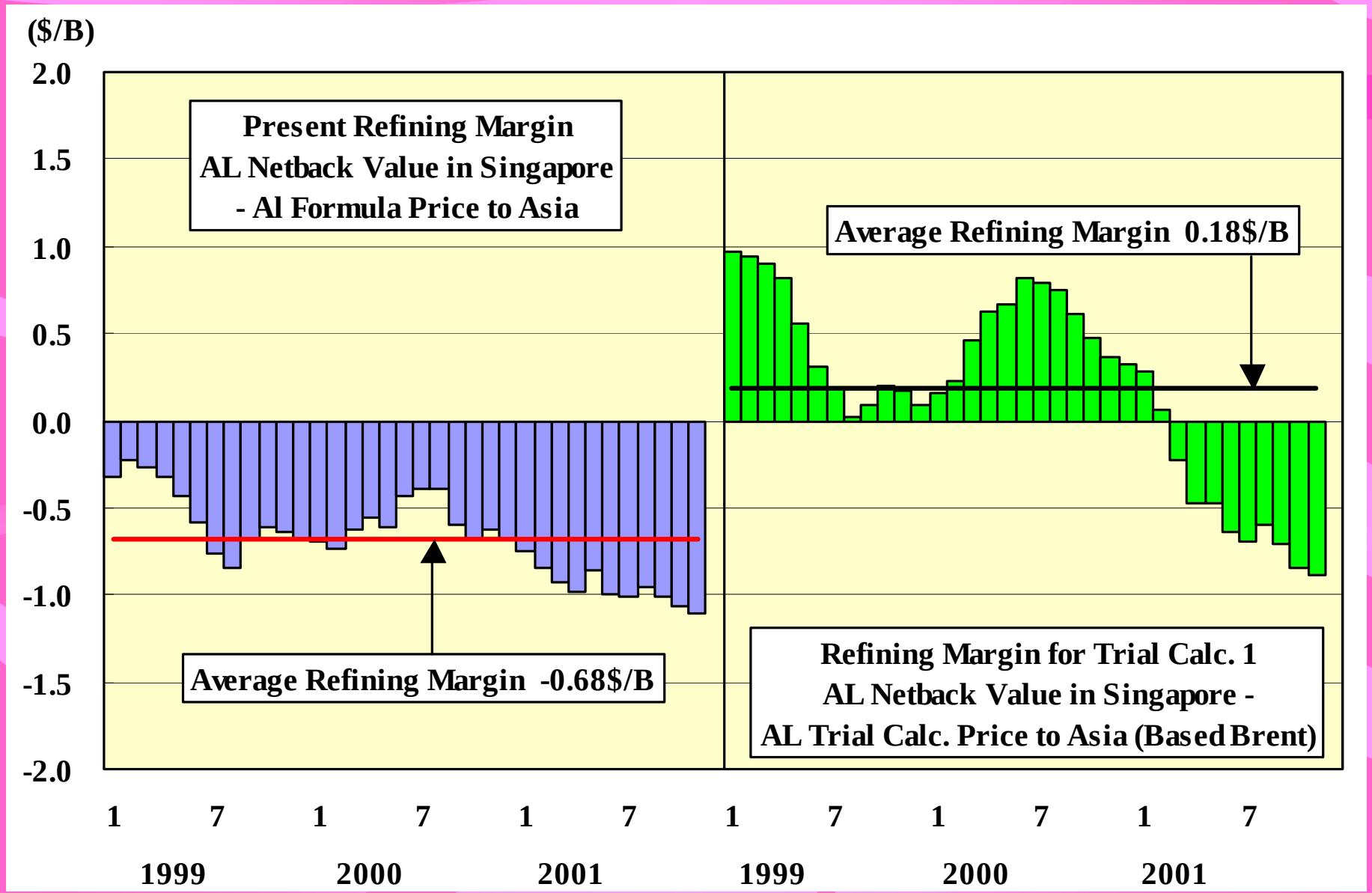

Problems in Pricing Proposal (1)

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- **Price formation not reflecting oil supply-demand in Asia**

  # Brent price is formed with reflecting oil supply-demand in Europe
  # Easy to be influenced by special problems in US oil supply-demand
  # Not always consistent with oil supply-demand environments in Asia

- **Problems of price manipulation due to production decrease in Brent**

  # The existence of price manipulation such as notorious squeeze
  # Twin market relation between physical spot / forward and IPE future

Proposal (2) for Pricing Change for the Sake of Reducing Premium

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- **Pricing Based on the Average of Formula Prices for Europe and US**

$$P_{\text{(Selling crude for Asia)}} = (P_{\text{(Formula price of selling crude for Europe)}} + P_{\text{(Formula price of selling crude for US)}}) /2$$

- **The Main Points for Pricing Proposal**

 # To adopt the average of formula prices for Europe and US

 # To calculate monthly average fitting with delivery timing from middle east oil producing countries

 # To minimize time lag between delivery for Asia and price settlement for Europe and US

Fig. 16 Proposal (2) : Pricing Based on the Average of Europe and US

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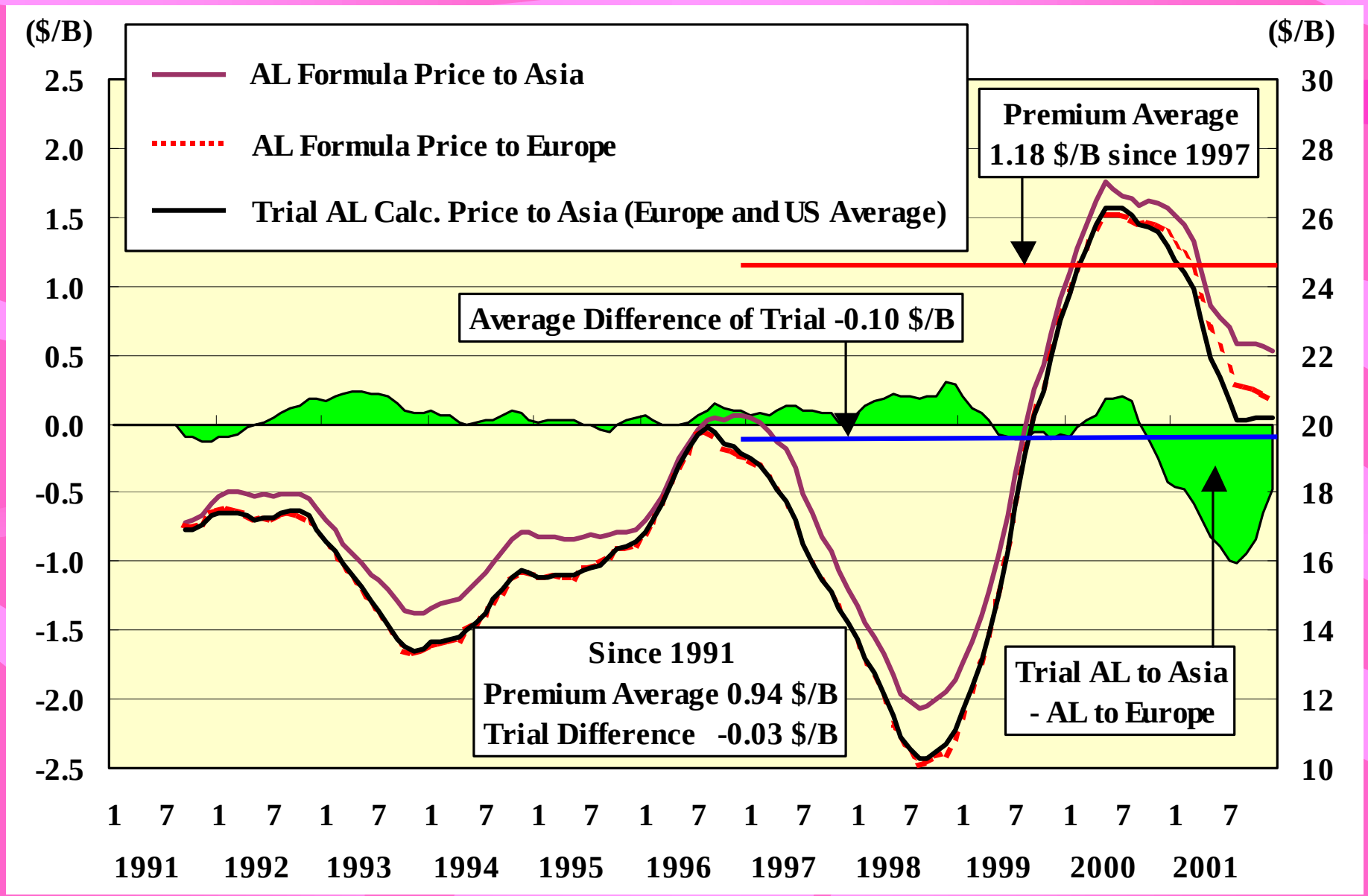

Fig. 17 Improvement of Refinery Margin in Proposal (2)

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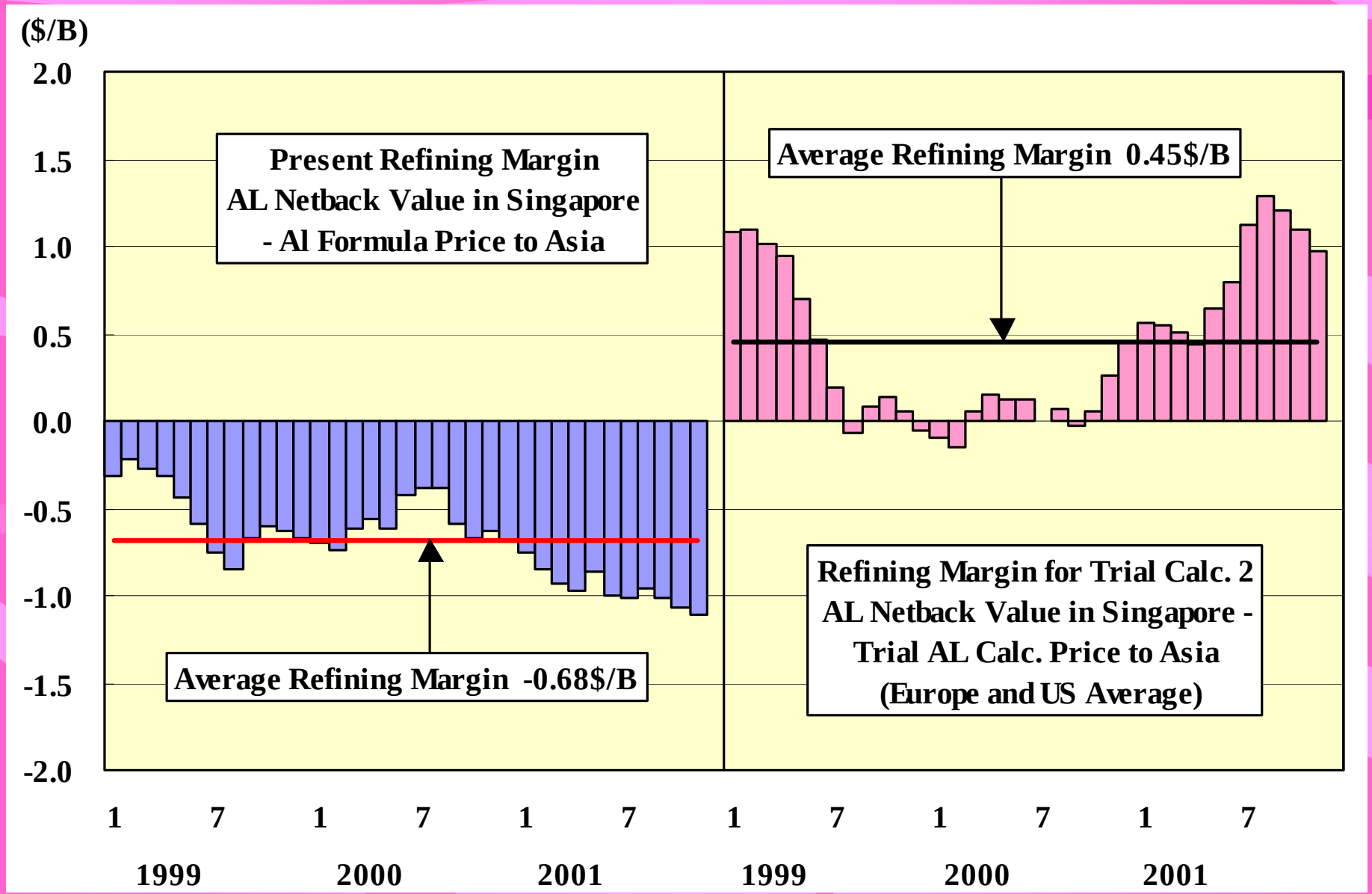

Problems in Pricing Proposal (2)

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- **Price formation not reflecting oil supply-demand in Asia**

  # Brent price is formed with reflecting oil supply-demand in Europe
  # WTI price is formed with reflecting oil supply-demand in US
  Easy to be influenced by US special problems such as pipeline
  # Not always consistent with oil supply-demand environments in Asia

- **Complicated price formation not based on marker**

  # Monthly average of formula prices is required by type of crude
  # Apprehension to Complicated method not based on common marker
  # Difficult to check suitability of price setting

Fig. 18 Oman Price Almost Coincident with Dubai Price

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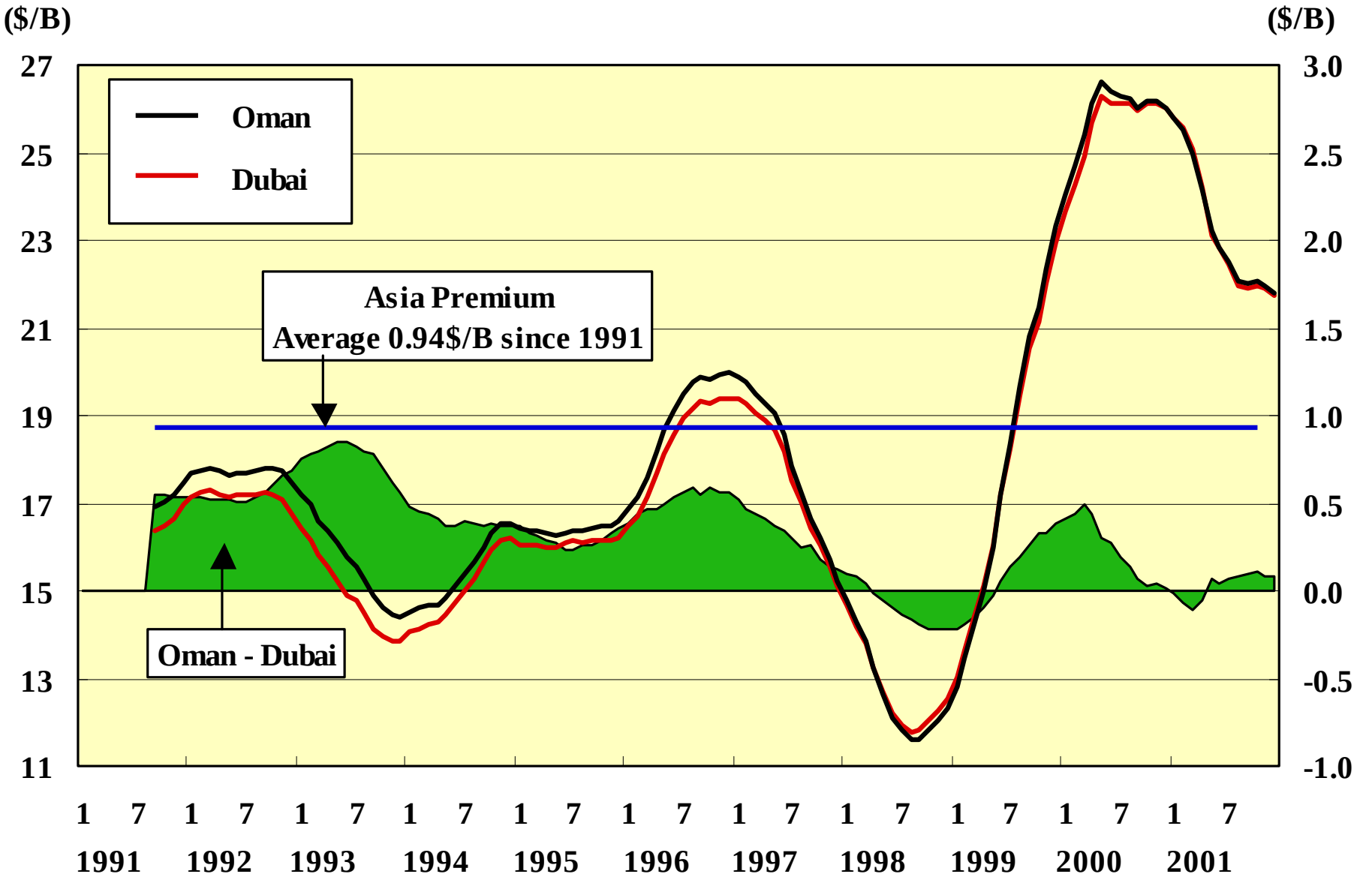

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4. Importance of Oil Product Market Preparation in Asia and Unity among Consuming Countries

Fig. 19 Product Price Difference between Singapore and Rotterdam

(Singapore price – Rotterdam price)

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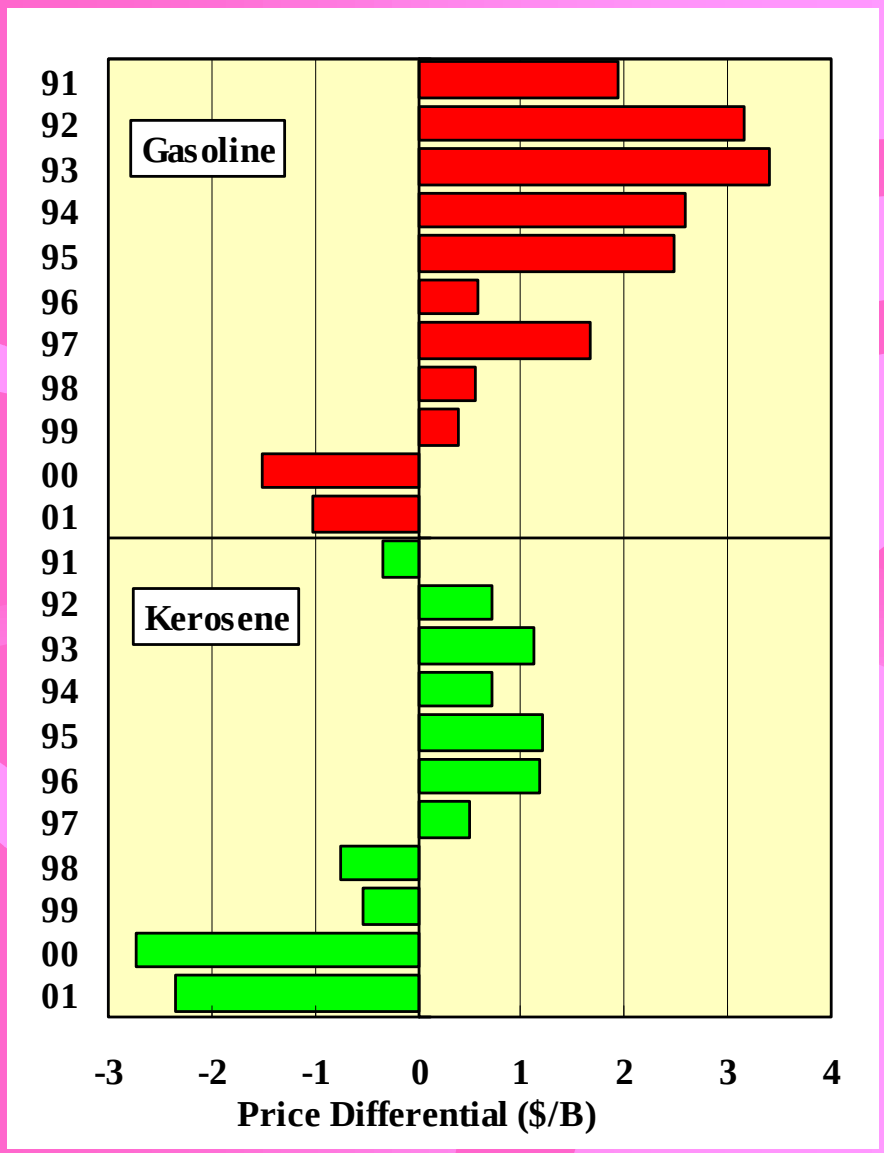

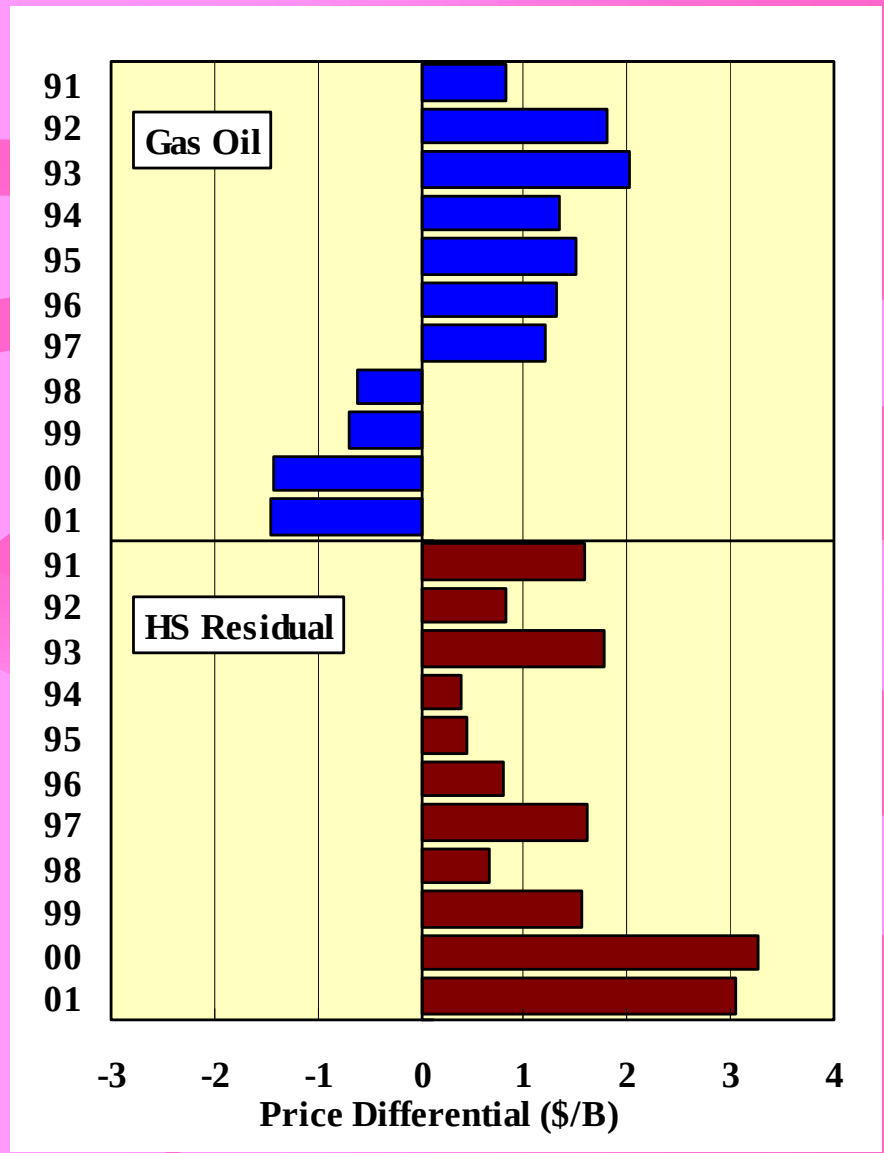

Fig. 20 Refinery Operation in Main Asian Countries

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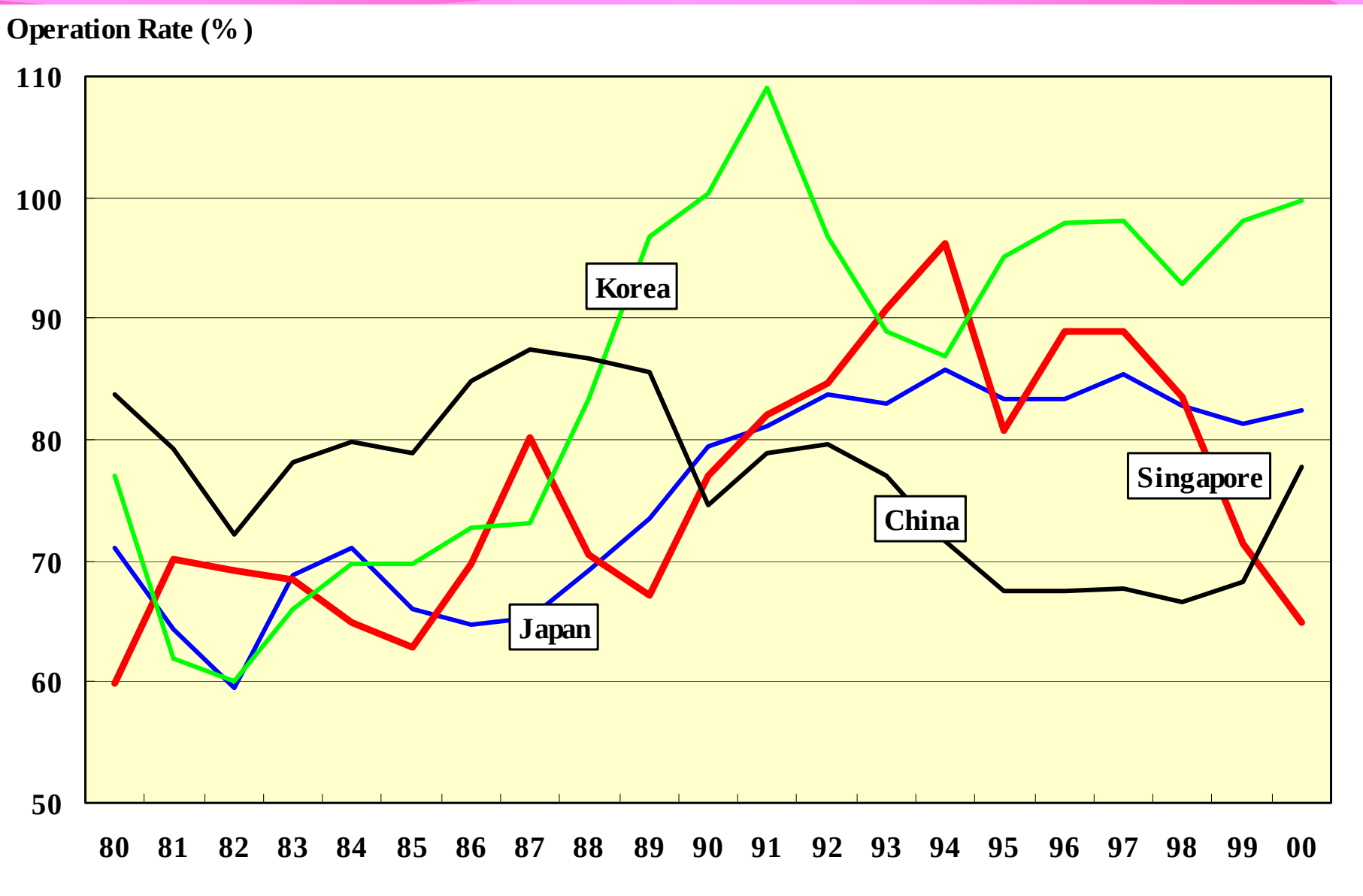

Fig. 21 Product Price Difference between US Gulf and Rotterdam

(US Gulf Price – Rotterdam Price)

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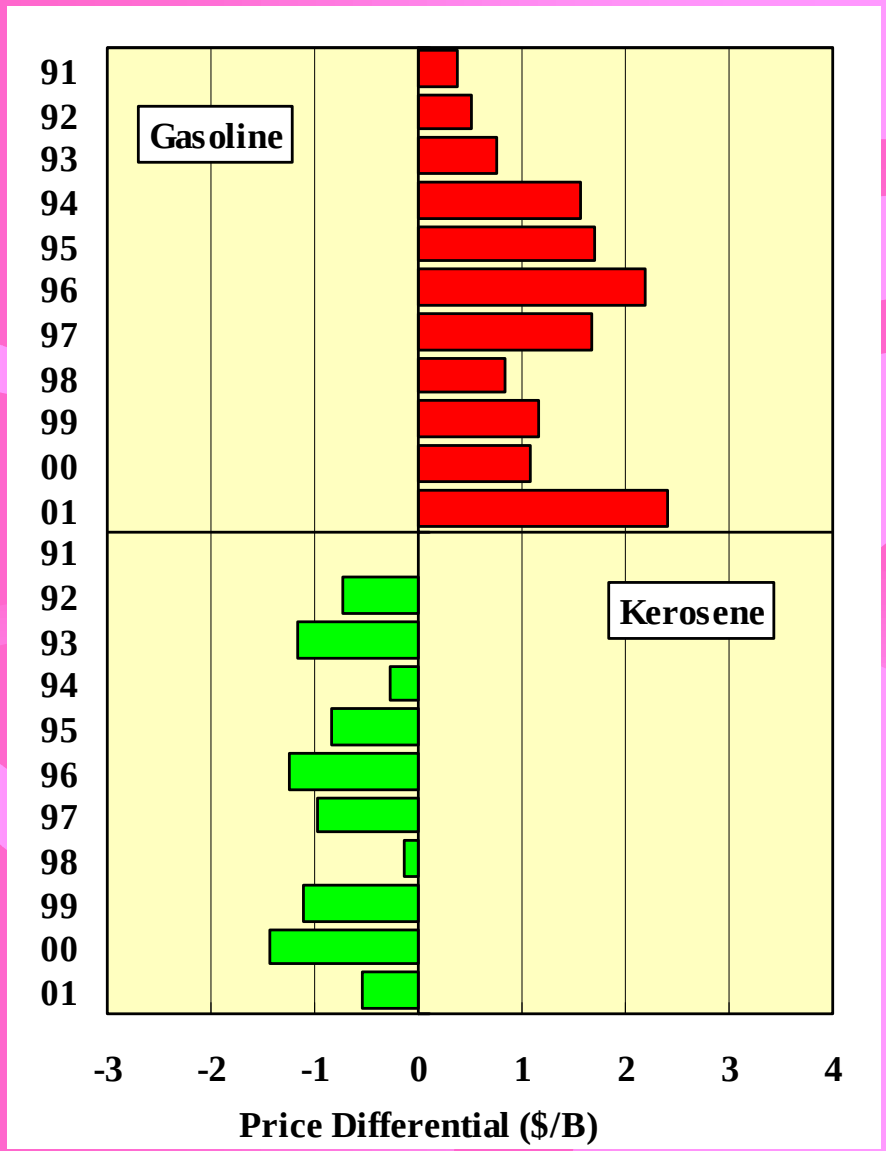

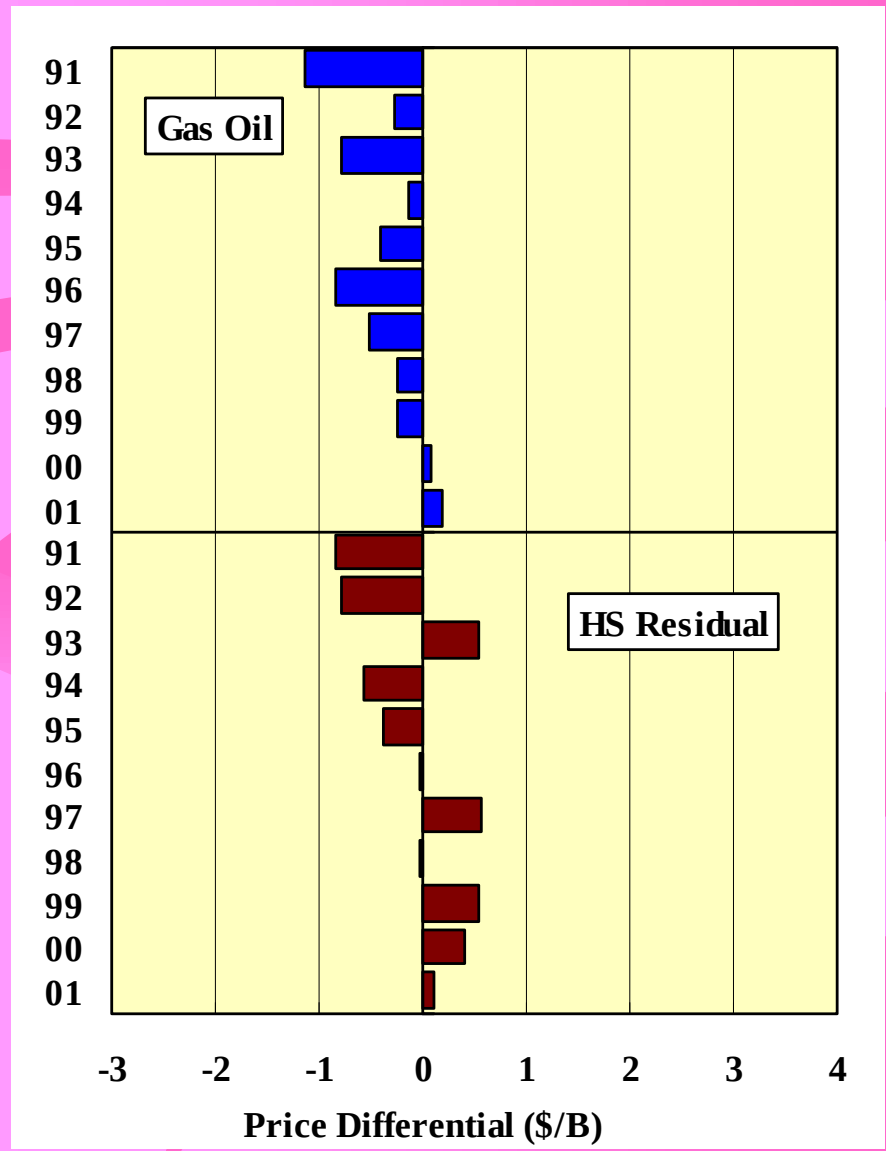

Table 2 Characteristics of Asian Market and Differences from European/U.S. Markets

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	Asian Oil Market	European/U.S. Markets
Crude	+ Futures trading market remains underdeveloped. + Price transparency is low. + Middle Eastern crude is predominantly used. Imports of West African crude are increasing. + No locally produced crude is used as a marker crude.	+ Futures trading market is fully mature. + Price transparency is high. + Use of Middle Eastern crude is limited. A variety of competitive crude exist. + Locally produced crude is adopted as a marker crude.
Products	+ Regulations are in force and necessity for risk management is small. + Singapore is the only international market. + Trading is done primarily in large-scale cargoes. + Product price is formed by adding cost to crude oil price.	+ Free market in which keen competition is carried on. + Spot product trading market is developed in a country and in a region. + A variety of trading in cargoes, barges, etc. + Product price is formed by spot and futures trading. Crude oil prices and product prices mutually influence each other.

Characteristics in Product Price Formation in Asia

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- **Trend of higher product price structure until 1996**

  # First, crude prices on a global basis such as Brent and WTI are determined by Europe/US oil supply-demand balance

  # Second, crude prices for Asia are determined from the global prices

  # Finally, Asia product prices are determined by adding cost to the crude prices for Asia

- **Product prices softened since 1997 and Some Gaps with Crude**

  # Decline in oil demand and surplus refining capacity due to economic crises in 1997

  # Product prices in Singapore softened and refinery margin worsened

  # Residual oil prices soaring due to the lowering of operation in Singapore

  # even though, price formation different from Europe/US still continues

Importance of Oil Market Preparation in Asia

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- **Oil market not prepared in Northeast Asia, large consuming area**

  # Large consuming area with oil demand of 12 millions B/D which is a similar size to Europe/US
  # Oil market is not prepared in the center of large consuming area
  # Singapore market is a just intermediate position for northeast Asia
  # Necessary to send information signals reflecting energy competitive relations in large consuming area

- **Required conditions for preparation of oil product market in Asia**

  # Streamlining and expansion of oil product trades within Asian region
  # Deregulation and privatization of oil industries in Asian Consuming Countries
  # Unification for quality standard of oil products in Asia

Responses of Consuming Countries to Asian Premium

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- **Responses of Asian consuming countries**

  # Formation of common consensus on Asian premium of crude oil
  # Voices of claim from Japan, Korea, China and so on in international conference in recent 2-3 years

- **The 8th International Energy Forum (IEF Osaka) Dialogue between Producer and Consumer**

  # Korea, China and the Philippines took up this issue in ASEAN+3 meeting
  # In IEF itself, India and Japan called attention to the importance of this problem
  # The parties concerned will examine this problem until next IEF (2 years later)

Unity among Consuming Countries and Negotiations with Oil Producing Countries

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- **Unity among Asian consuming countries**

  # Important to make a common perception among Asian consuming countries and to unite in various stages such as policy, government and private sector
  # Deliberation on response measures through ASEAN+3 meeting
  # Necessary to intensify negotiation power through unity among consuming countries

- **Negotiation with oil producing countries**

  # Important to have opinion exchanges with oil producing countries through dialogues between producers and consumers such as IEF
  # Important to have an energy dialogue between East-West Asian countries whose interdependent relations will be tight in the long-term

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5. Spot Trading of Middle East Crude and Elimination of Asian Premium (Middle- or Long-term Measures)

Proposal (3) for Pricing Change for the Sake of Reducing Premium

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- **Pricing Based on Spot Price of ME Crude through Realization of Spot Trading**

$$P\ \text{(Selling crude)} = P\ \text{(AL spot price)} \pm a\ \text{(adjustment factor)}$$

- **The Main Points for Pricing Proposal**

  # ME crudes in main stream will be a price marker by the realization of spot trading

  # Marginal markers in Europe/US is reflecting special conditions in consuming area

  # Marker of ME crudes will reflect global oil supply-demand

  # Premium will be removed because the same marker will be used for each consuming area

Fig. 22 Proposal (3) : Pricing Based on AL Spot Prices

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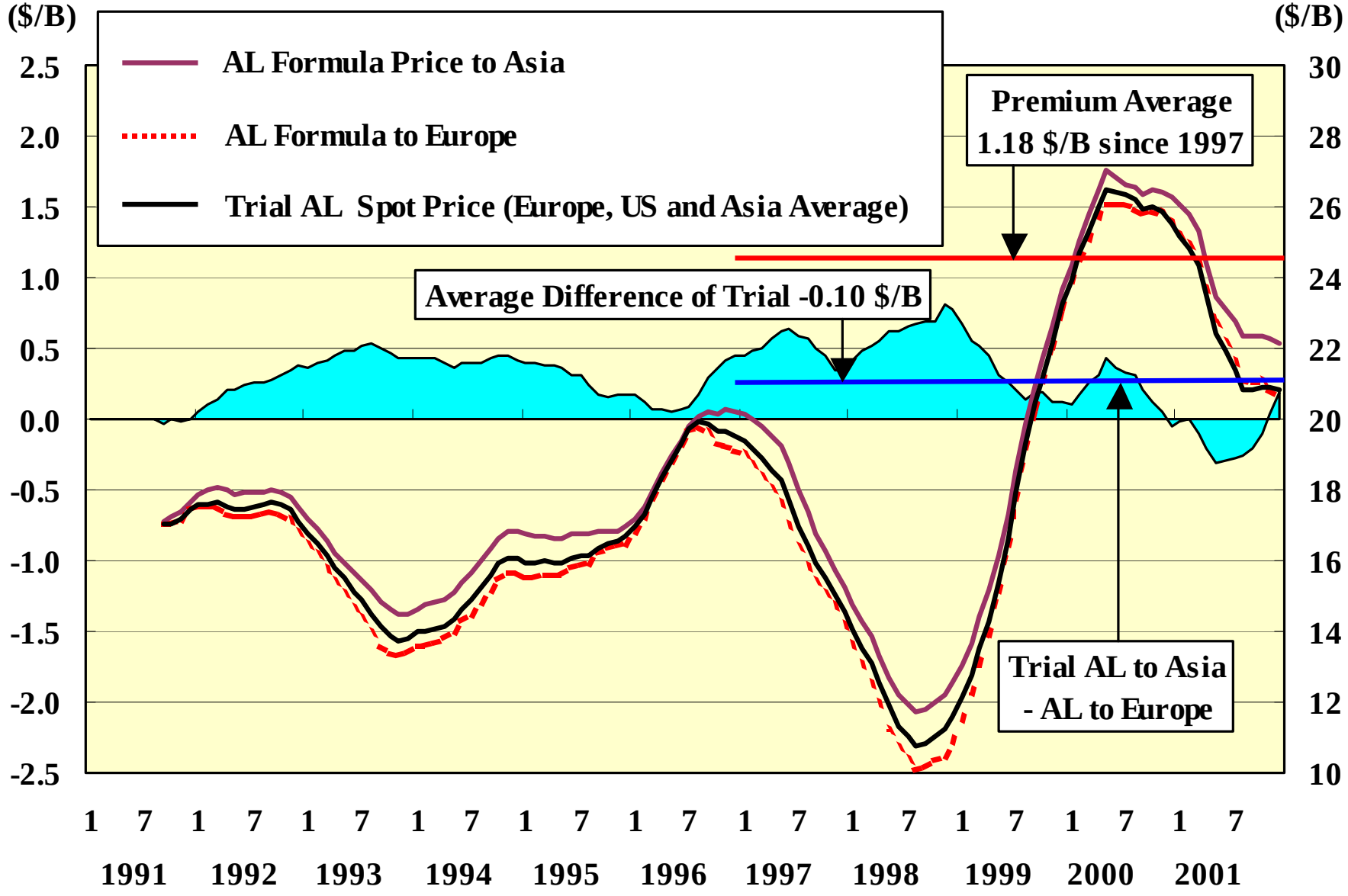

Fig. 23 Improvement of Refinery Margin in Proposal (3)

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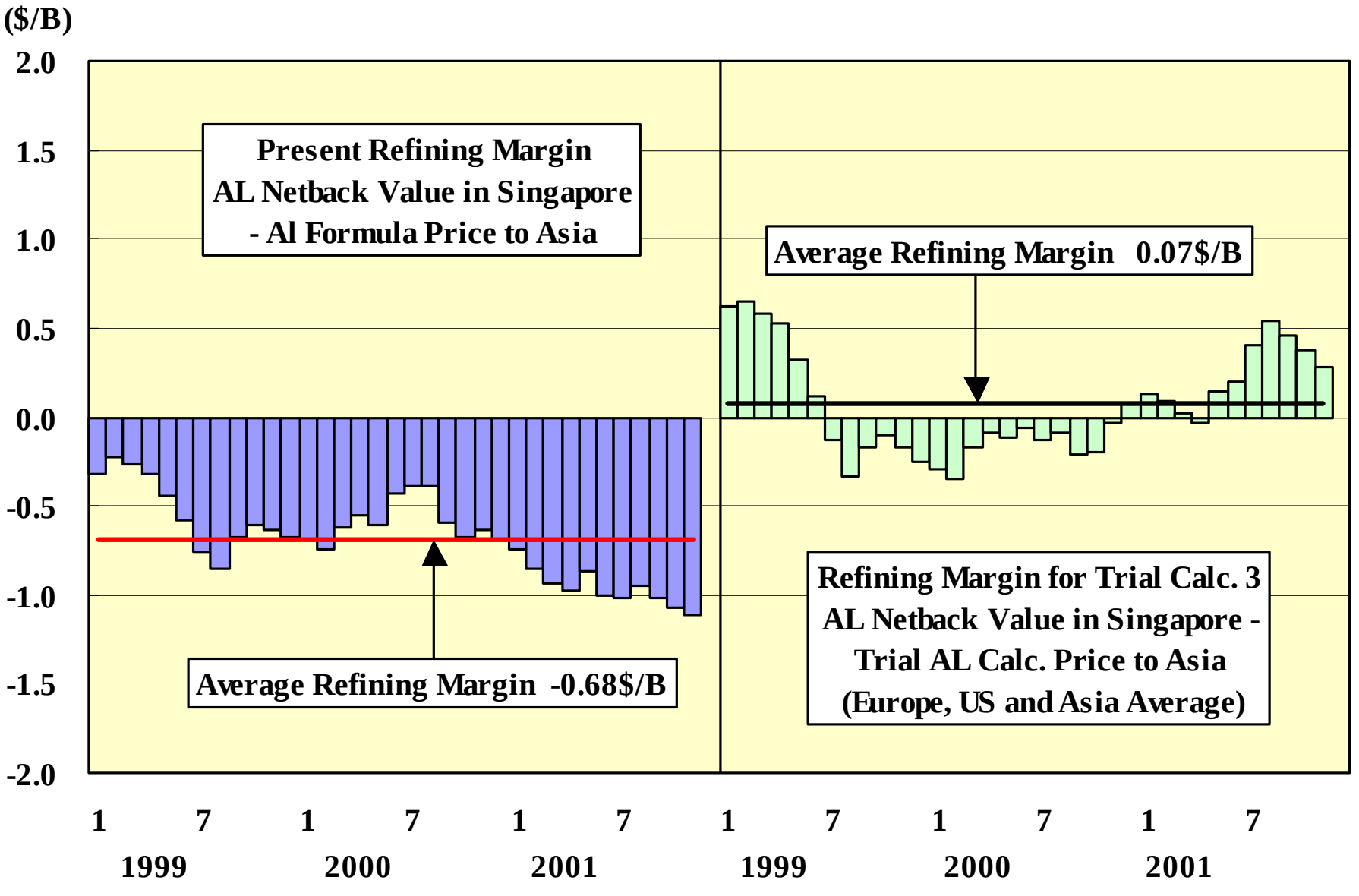

Problems in Pricing Proposal (3)

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- **Negative attitude of oil producing countries to spot trading**
  - # Not hope to repeat price collapse of crude oil in 1986
  - # Spiral price drops due to the guarantee of refining margin in netback selling
  - # Restriction of destination change and Inhibition of spot trading
  - # Can not expect change of this attitude in the short-term

- **Changes in oil supply-demand environment after 15 years passed**
  - # Reduction of surplus crude oil production capacities from 1986
  - # Small possibility of one-way price drop even if starting spot trading of ME crudes
  - # Difficult to make a price stabilization using marginal crudes

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6. Global Links of Oil Market and Stabilization of Crude Oil Price (Conclusion)

Fig. 24 Global Links of Oil Markets

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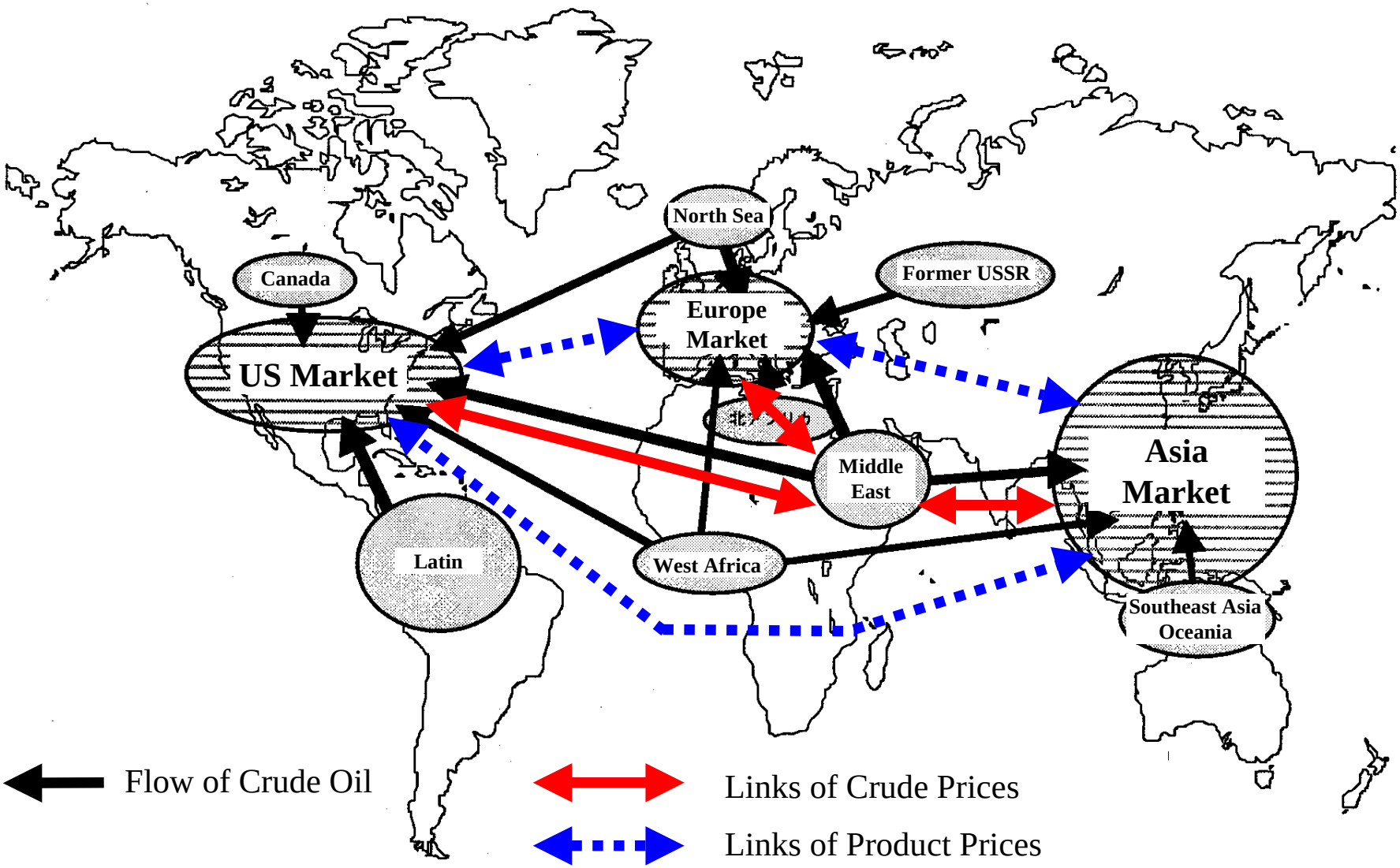

Fig. 25 Violent Fluctuations in Crude Oil Prices in and after 1996

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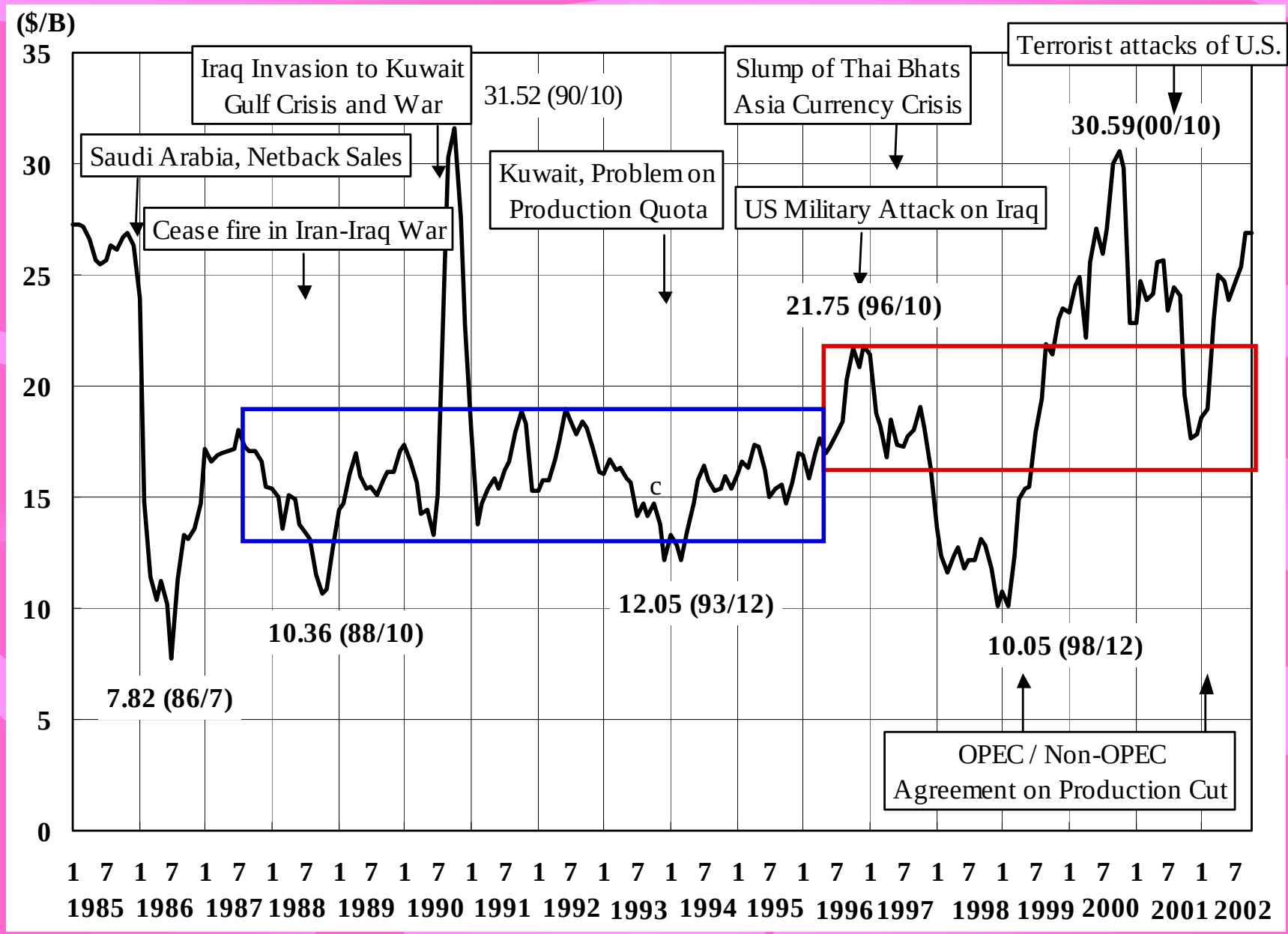

Table 3 Too High OPEC Price Band

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Crude oil price level (range), $/bbl	Oil-producing & oil-consuming countries' responses
$7-13 (average $10)	● Lowest level, below which neither OPEC nor non-OPEC want to see oil prices fall. ● At lower prices, OPEC and non-OPEC strengthen unity to defend price level desperately. ● Oil-producing countries' response to crash in oil prices in 1986 and 1998.
$12-18 (average $15)	● Concerted action by OPEC and non-OPEC to maintain crude oil prices. ● Alert zone for oil-producing countries (non-OPEC's response in 2001). ● Price level at which non-OPEC is encouraged to begin development of new oil reserves.
$17-23 (average $20)	● Price level at which non-OPEC assumes profit-taking positions. ● Russia's move in recent months, non-OPEC's behavior in the past. ● Price level at which non-oil alternative energy sources' entry into energy market begins.
$22-28 (average $25)	● Price level that OPEC wants to maintain. ● To maintain the price level, production cuts by OPEC alone is necessary. ● Development of crude oil and non-oil alternative energy sources become activated.
$27-33 (average $30)	● Price level at which all oil-consuming countries become united in criticizing high oil prices. ● Animated discussions about releasing oil stockpiles for emergency use. ● Oil-consuming countries' response in 2000 to crude oil prices which remained at high levels

Spot Trading of Middle East Crudes and Stabilization of Crude Oil Price

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- **Factors affecting violent fluctuations of crude prices**

  # Too high OPEC price band and production controls
  # Weakened supply cushions such as insufficient refining capacities and low level of oil inventory
  # Overshooting reactions in future market and bottlenecks in spot market
  # Reflection of marginal supply-demand by marginal price marker

- **Formation of marker price by spot trading of ME crudes**

  # ME crudes are the mainstream reflecting global supply-demand balance
  # Without direct interventions, spot trading is consistent with production controls
  # Stabilization of crude prices is serious subject also for oil producers

Some room to suggest the adoption of spot trading to oil producers from the viewpoint of stabilization of crude prices?

Middle and Long-term Subjects aiming at Reducing Asian Premium

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- **Preparation of oil product markets in northeast Asia and Asia**

  # Streamlining and expansion of oil markets in various consuming areas
  # Formation of the linkages of oil markets between Asia and Europe/US

- **Developments of alternative crudes except ME crudes**

  # Procurement of increasing crude oils in the West of Suez such as West African crudes
  # Developments of neighboring oil resources such as Sakhalin and east Siberia
  # Developments of liquid fuels (GTL) from coal and natural gas

- **Further reinforcement of flexibilities in consuming areas**

  # Flexible combinations of crude oil processing and oil product import/ export
  # Reinforcement of flexibilities in fuel selection in consumer sides