THE ECONOMIC DEVELOPMENT POLICY IN THE TRANSITION TOWARD A MARKET-ORIENTED ECONOMY IN THE SOCIALIST REPUBLIC OF VIET NAM

PHASE 1
FINAL REPORT

OPINIONS OF THE FIVE-YEAR PLAN FOR SOCIAL AND ECONOMIC DEVELOPMENT 1996-2000 IN VIET NAM

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Overall Contents

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Preface to the Final Report, Phase 1

This study was proposed after consultation with Viet Nam's Prime Minister Vo Van Kiet and Vietnamese officials when a high level Mission of the Japanese government on Economic and Technical Cooperation visited Viet Nam in October 1994. A formal agreement was reached during Party Secretary-General Do Muoi's official visit to Japan in April 1995 to carry out the study as part of Japan's official development aid (ODA) to Viet Nam. It was agreed that the Study would be implemented under the Social Development Studies Program of the Japan International Cooperation Agency (JICA) and a Scope of Work Agreement defining the details of the Study was officially signed in August 1995 between Vice Minister Mr. Vo Hong Phuc of Viet Nam's Ministry of Planning and Investment and Councilor Mr. Norio Hattori of Japan's Ministry of Foreign Affairs Economic Cooperation Bureau.

The project was agreed to be conducted as a joint study between Japan and Viet Nam and the research groups for that study was organized on both sides with the participation of first rate scholars and experts. Professor Shigeru Ishikawa headed up the Japanese Research Group, Dr. Nguyen Quang Thai the Vietnamese project team. Under the Agreement, the project is to be pursued in two phases. During the first phase, the over-arching goal is to study the Five-year Plan for Social and Economic Development in Viet Nam (covering the years 1996 to 2000). This phase was planned to end in June 1996 with the submission of a Project Report to the leadership of Viet Nam via the Ministry of Planning and Investment. The research of the first phase includes, in addition to the study for the general commentary on the draft Five-year Plan, four specific studies relating to the following four selected topics respectively which are to be conducted at the four separate Sub-Research Groups as "in-depth" studies of the draft Five-year Plan.

(1) Macro economic growth and the its relationship with inflation and stability;
(2) Capital mobilization in the fiscal and monetary domains;
(3) Industrial development and industrialization policies; and
(4) Policies on agriculture and rural development.

During the course of the research, both sides agreed to add the three topics below, though the research on them has not yet been organized:

(5) Development gaps among domestic regions;
(6) Unemployment and underemployment problems; and
(7) Relieving starvation and mitigating poverty.

This research project has attracted the attention and interest of Viet Nam's leaders. Party Secretary-General Do Muoi and other senior officials have received reports on on-going research findings from the scholars involved in the project. Scholars on both sides have revised their reports in light of the leading opinions provided by Party Secretary-General Do Muoi in September 1995 and March 1996, and at his request they have prepared an Executive Summary Report (March 1996) earlier than the Final Report so that

their opinions may be incorporated in the document "Orientations and Tasks of the 1996-2000 Five-year Plan for Socio-Economic development in Viet Nam."

The Executive Summary Report was written solely, and the Final Report was written mainly, by the Japanese Research Group but it reflects the findings of joint research conducted by both sides of Japan and Viet Nam. This joint research was deepened through five seminars of various sizes, two in Hanoi (the Start-Up Seminar in August 1995 and the Seminar to hear opinions on the Draft of the Final Report in March 1996) and three in Tokyo in October and November 1995 and January 1996.

The method this research project desired at its planning stage to follow was a "joint study" of the Vietnamese and Japanese Research Groups by way of identification of research topics and determination of research methods and data on the basis of joint discussion, proceeding of the joint study with frequent contacts, meetings and field surveys, and writing (as much as possible jointly) of the research findings and derived policy options. We are pleased that this desire was achieved at least preliminarily, especially toward the end of the first phase.

The Final Report consists of five parts, and is printed correspondingly in five volumes. Part One is on general commentary on the draft Five-year Plan*, and the following Parts on in-depth studies of specific issues of the draft Five-year Plan conducted by the four Sub-Research Groups. In each of these Parts (or Volumes), that summary of the research results either for general commentary or at each Sub-Research Group which was written for the Executive Summary Report, is reproduced (with some revisions) and, together with the comments on it by the Chief Sub-Research Group of the Vietnamese side, constitute the Introductory Chapters. They are followed by papers and notes, each written by either Japanese or Vietnamese member, and joint field-survey reports.

The research tasks (or topics and sub-topics) selected for the five Parts are summarized as follows.

First, the research tasks of the General Comment Part (Volume 1) are the interpretation and evaluation of the contents and outcomes of the Doi Moi policy, the leading strategy principles which was initiated in 1986 and is still effective and governing the new Five-year Plan (draft), and the analyses, from a more operational view-point, of the policy-systems contemplated in the new Five-year Plan (draft). The latter questions, firstly, from the aspect of economic system reform, what is the structure of blue-prints of marketization designed for the Vietnamese economy is, and, secondly, from the aspect of productive force restructuring, what type of the economic "development model" for industrialization or its variant available in development economics is suitable as a guideline for the Viet Nam economy taking into consideration the initial conditions of her economy. The answers to these questions should be useful as clues for exploring the policy options for Viet Nam.

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* In this Final Report, the term "Draft Five-year Plan" refers to either one of the following documents which were sent to the Japanese Academic Group directly from the Ministry of Planning and Investment. Specific reference of either of these is made in our report only when it is necessary.

(1) *1996-2000 nen gokanen no keizai shakai kaihatsu keikaku no shuyou naiyo no shoki soan* (This is the Japanese translation version of the original in Viet Nam language which was sent to the Japanese Academic Group at the end of June 1995 so that opinions on it may be presented at the Start-Up Seminar in August 1995. In English, this is *Initial Draft of the Five Year Socio-Economic Development Plan in 1996-2000:* Main Contents. Later in August 1995, the document, Some Issues on Industrialization and Socio-Economic Development in Viet Nam from Now Upto the Year 2000 was sent to the Japanese Academic Group. This appears to be a version with minor revisions of the "Initial Draft.")

(2) Socio-Economic Development and Investment Requirements for the Five Years 1996-2000, Government Report of the Consultative Group Meeting, Paris, 30 November to 1 December 1995, Hanoi, October 1995. (This was transmitted to the Japanese Academic Group on October 3, 1995 so that opinions on it may be presented at the Seminar in Tokyo in January 1996.)

In our earlier general comment on the "Initial Draft" of the Five-year Plan, four items of policy options were suggested, which in fact were made the research topics of the four Sub-Research Groups at its start. It is possible to locate these four policy options within the overall framework we have just shown for the analysis on the policy-systems of the Five-year Plan (draft).

The study task of the Part for Macroeconomy Sub-Research Group (Volume 2) is to attempt a simulation analysis of the issue in a hypothetical situation where the Viet Nam government wants to attain the degree of a high rate of growth of GDP which is enabled only by a considerably high rate of domestic investment, considering the fact that the present level of domestic saving ratio is still very low, not significantly higher than zero, and both the debt service payment obliged by the large accumulated external debts and the minimally required government social service expenditures amount large, how strong would be the pressure for domestic inflation and external balance of payment deficit. The statistical indicators used for simulation are taken from the figures in the Five-year Plan draft.

To this Part is added a study on the environmental issues: how important it is for such a country as Viet Nam where industrialization is at its initial stage to take measures to minimize the "environmental degradation" and "industrial contamination" as early as possible.

The research tasks of the Part for the Fiscal and Monetary Policy Sub-Research Group (Volume 3) are firstly, a systemic analysis to clarify the transformation of fiscal and monetary mechanism of the Vietnamese economy accordingly as the economy changes its resource allocation formula from the one in the planned economy of basing itself on the centralized material planning and, with it, material allocation to the one in the transitory economy where the government intervenes partly by material allocation and partly through the fiscal and monetary policy instruments that are conventional in the market economy. The research tasks are, in addition to it, to investigate the *modus-operandi* of the present fiscal and monetary system, from the point of view of the effectiveness of the domestic saving mobilization and to explore the measures to improve them. As priority items, the issue of how to adjust the fiscal relationship between the central and provincial governments so that the total government revenue could be raised and the regional income disparity be reduced and the issue of how to raise and enhance the financial system which may facilitate the preservation of the long-term and medium-term investment funds for industry, in particular, to the private sector are taken up.

From the point of view of foreign saving mobilization, studies are made with respect to the sources from FDI, ODA and others and the issues involved in these source.

The research tasks of the Part for Industrial Policy (Volume 4) are firstly to make surveys not only on the existing production and export-import statistics of industry, but also on the not-yet well covered or organized statistical information and data on industry on the by firm or by establishment, by ownership, by size or by regional bases, and thereby to clarify the present situation and its characteristics as well as the issues to be

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(3) *Directions, Planning Tasks of Socio-Economic Development for 5-Year 1996-2000, Report of the Central Executive Committee of the Party, Section VII to be Submitted to the Eighth Congress of the Party*, Viet Nam Communist Party Central Executive Committee, Hanoi, November 14, 1995. (This was sent to the Japanese Academic Group in March 1996 so that opinions on it may be presented at the Final Seminar in Hanoi.)

(4) *Political Report of the Central Committee (VIIth Tenure) to the VIIIth National Congress of the Communist Party of Viet Nam* (This was published in Viet Nam dated April 10, 1996. Comments for this was in time only for including them in Postscript to the Executive Summary Report.). The finally adopted version of this document at the Party National Congress is the following. Communist Party of Viet Nam VIIIth National Congress, *Orientations and Tasks of the 1996-2000 Five-year Plan for Socio-Economic Development, Report of the Central Committee, the VIIth Tenure, to the VIIIth National Congress*, Hanoi, 28th June-1st July, 1996. It was sent to the Japanese Academic Group on July 12, 1995.

solved of the Vietnamese industry. Exploration should be made on that basis, and taking into consideration the experiences of East Asian economies as a predecessors of Vietnamese industrialization, with respect to the order of industry-by-industry development in terms of the dynamic shift of comparative advantage position. The use of FDI and the way of participation in the regional integration schemes of AFTA and APEC are also to be explored. Lessons must be learned also from the experiences in the East Asian countries with regard to the matter of establishing the oil refining, petro-chemical, iron and steel, cement and chemical industries, which are capital lumpy and intensive, yet the government was anxious to build earlier, capturing the advantage in rich resource endowment.

Finally, the research tasks of the Agriculture and Rural Development Sub-Research Group (Volume 5) are to identify the policy instruments for further increase in agricultural production for the sake of promoting economic development, on the basis of the analyses on the changes in the institutions and organizations of agricultural production as well as in the production incentives during the 1980s and in the first half of the 1990s. Among these research tasks, especially important are the clarification of the roles of the factors like the potentiality of increasing the area under rice planning, the production incentive effect of institutional changes and price increases, research and development and irrigation investments. Investigations are also to be made on the way to improve agricultural finance and farmers' organizations in the way consistent with the market-oriented economic reform.

In pursuance from the Final Report, the joint research of the second phase will start on the basis of a new agreement between the two parties.

In addition to submitting this Final Report to the leadership of Viet Nam, we have sent it to you in hopes of soliciting your opinions for more effective start of the second phase joint study.

July 1996, Hanoi and Tokyo

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1
Summary of the Studies on Industrial Policy

The startling economic growth demonstrated by countries across East Asia in recent years has attracted worldwide attention to their industrialization-oriented policies. Ambitious initiatives in industrialization form one cornerstone of Viet Nam's 5-year economic plan, and as such, they call for an appropriate set of industrial policies. Drawing on the findings of our own research, in this paper we review the structure of Vietnamese industry and trade as well as the policies that have been integrated into the country's current 5-year plan. From that foundation, we then analyze problems facing new investments now planned in five capital-intensive industrial sectors (steel, petroleum refining, petrochemicals, urea fertilizer, and cement), and explore criteria for successful investment with reference to examples of both success and failure in other countries. In addition, we discuss bottlenecks to foreign direct investment (now an essential ingredient for industrialization in most ASEAN economies), problems of small and medium enterprises and rural industries, and the influences that AFTA and APEC membership will likely have on Viet Nam.

I. Structure of production and trade, and industrial policy in Viet Nam

In the production of Viet Nam, agricultural, industrial and service sectors accounted for 27.7%, 29.6%, and 42.7% of GDP respectively in 1994. Industrial sector in ASEAN countries in 1994 is in the range of around 40% (Thailand 39.2%, Indonasia 40.7%) and considerably higher than that of Viet Nam. Simply judging from the ratio of industrial sector, Viet Nam is currently comparable to Thailand in the early 1980s.

Though industrial output in Viet Nam has been climbing strongly for some years now, about half of the total output is in primary goods, and relatively little in manufactured goods. For instance, crude oil, coal, and other fuels accout for 16%, and foodstuffs, 34% (1994 figures). On the other hand, export oriented products such as textiles (textile, sewing and tanning of leathers etc.9.5%) and electronics (2.1%) have small shares. Furthermore, these industries have not increased their shares during this period. This shows that the growth of industrial output resulted from the expansion of domestic market and the increase in export of primary commodities. In other East Asian countries, the rapid increase in the share of textiles in production and employment was widely observed at the initial stage of economic development, subsequently replaced by

Box 1 Trends in industrial structure (the Colin Clark Rule)

A country's industrial structure evolves with its economic development.

During the early stages of development, industrial structure will be heavily weighted in primary industries, as industrislization proceeds, the weighting in the secondary or manufacturing industries will expand. Once the industrialization process peaks out, the tertiary Sector will make up a growing share of industrial structure, coupled with a reversal or decline in the share attributable to the secondary Sector. Looking at industrialization trends for other countries, in Japan the secondary Sector peaked at 45.2% in 1970, and in South Korea, at 45.1% in 1991.

Box 2 RCA of industrial goods in Viet Nam

In measuring comparative advantage, RCA (Revealed Comparative Advantage. Comparison of certain country and world average in the export share of certain product.) is widely used. Trade data of Viet Nam shows that RCA of manufacturing commodities are generally very low. Among them clothing and accesaries, and footwear show RCA above 1.0 (in 1994, 3.58 and 3.30), showing advantage in these industries. In other East Asian countries, however, these items had shown RCA more than 10.0 at the peak period and there exists great potential for Viet Nam to expand the export of these items in the future.

SITC	Commodity	1991	1992	1993	1994
751	office machines	N.A.	N.A.	0.03	0.09
785	bicycle	N.A.	N.A.	0.14	0.10
84	clothing and accessories	1.94	2.47	2.22	3.58
85	footwear	0.49	0.86	2.55	3.30
896	fine arts products	0.00	0.01	0.01	0.00

machineries (electronics, transportation, etc.). From this trend, one can conclude that Viet Nam has not begun ASEAN-style export-led development yet.

Regarding trade, Viet Nam's export to CMEA countries has dropped to a negligible level from 1991, rapidly shifting its destination to the Western markets. The export grew rapidly by 92.3% between 1991 and 1994. Primary goods (mostly food and crude oil) remain the dominant export and accounted for 73.1% of total export in 1994. Among industries, light industries accounted for 18.3% of total export, contributing to 29.6% of total export growth. Almost all of this growth was clothing (weaving and shoes). The current export structure reflects Viet Nam's economy just starting industrialization. Viet Nam needs to diversify industrial export toward skilled labour intensive products such as machinary and electronics, considering the development pattern of other East Asian countries.

II. Industrial policy of Viet Nam

Viet Nam's industrial policy also addresses the importance of the efforts to shift the industrial structure to gain a comparative advantage in the international matket, since the industrial sector is expected to be the major driving force for the economic development. The growth of industsrial sector is targeted at 14-15% annually toward the year 2000, with the share of the sector reaching to 34-35% of GDP in the year 2000. To accomplish this target, both export-oriented and import-substituting industries are expected to be promoted. Other elements such as rural development, pollution control and compatibility with the rules of AFTA and WTO must be taken into consideration. Under this environment the government of Viet Nam must choose the best industrial growth path, which leads to the sectoral industrial policy of each industry.

Viet Nam's sectoral targets in the five year plan seem broad-ranging and ambitious in their scope and scale. Moreover, they underscore expectations that the country will be striving in parallel to boost export and import-substitution industries, as well. Above all, the past experiences of other East Asian countries in the cited industrial fields will be of value to the search for the growth path that offers Viet Nam the best prospect of exploiting its comparative advantages. With few exceptions, most Asian countries to date have opted for export-oriented models of growth, and on that basis they typically started by developing their textile industries and other simple labor-intensive sectors, thereby effectively putting their labor forces to work. Next, they shifted their emphasis to more advanced labor-intensive industrial pursuits such as the manufacturing of machinery and electronics. Certain ASEAN member-states in particular found it relatively easy to get their more-advanced, labor-intensive operations up and running by capitalizing on foreign direct investment and importing sophisticated plant equipment developed in the electronics revolution. In view of the current international backdrop, it would appear that shifting from low-tech to high-tech labor-intensive industries, as many ASEAN countries have done, is the best path of growth that would allow Viet Nam to exploit its comparative advantages in certain export industries. Many foreign investors share this view. Indeed, it is a position that seems all the more persuasive if one bears in mind Viet Nam's competitive edge in human resources.

Box 3 The Korean experience and the current situation in the ASEAN economies

In 1973, Korea formulated a master plan for the heavy and chemical industries and embarked on an ambitious program comprising extensive investments in the steel and petrochemical sectors. At the outset, its investments were criticized as being imprudent and simply too big in their scale. However, thanks to expanding domestic demand and heightened exports, the country succeeded in weathering the financial burden. In fact, those investments effectively laid the foundations for much of South Korea's strength in the international market today. It should be noted, though, that the country put more emphasis on domestic demand than on exports. Only in the 1990s have the ASEAN nations reached a stage in their growth at which domestic demand is sufficient to accommodate investment projects in the steel and petrochemical industries.

One factor deserving special attention is the importance attached to capital-intensive industries by the sectoral goals of the current 5-year plan. Countries with populations as large as Viet Nam's will eventually need their own domestic chemical and heavy industries. Though industries in these fields can be expected to have a number of favorable spillover effects on other sectors of the economy, they typically demand enormous initial investments and on top of that, will not engage a very sizable share of the labor force at the outset. Unless steps are taken to identify the important features of a given industry and ensure that investments in it are not wasted, the resulting burden on the economy will probably be severe. In the next section, we pursue a multifaceted examination of five industrial sectors thought to be targeted for especially heavy levels of investment under Viet Nam's current 5-year plan, and follow up with several recommendations.

III. Five capital intensive industries and possible problems for new investment

Labor-intensive pursuits seem to be the most appropriate approach to industrialization for Viet Nam at present. However, history shows that capital-intensive projects in the heavy and chemical industries have played an important role in the overall industrialization process in some Asian countries (see box 3). In the initial August 1995 draft of its Five-year Plan, the Vietnamese government demonstrated strong interest in a number of capital-intensive projects in the heavy and chemical industries that could be expected to effectively exploit the country's natural resources. Following is a discussion of the features characterizing five of those sectors—in steel, petroleum refining, petrochemicals, urea fertilizer, and cement—with attention to international market trends and the possible problems for new investment.

All of these industries typically demand enormous capital outlays and have long payback periods. Moreover, even small differences in unit production cost can be the dividing line between business success and failure. Another problem is that all the products of these sectors (except cement) are international commodities, and as such, their prices are subject to steep fluctuations influenced by global economic trends and the balance of international-market supply and demand. Viet Nam can expect a sharp increase in domestic demand for the products of its heavy and chemical industries once it reaches a further stage in its economic development. At present, though, that demand falls short of what should be considered an appropriate scale for capital outlays in these fields. This reality demands an in-depth study of such factors as investment timing, trends in international supply and demand, as well as the feasibility of each project that is planned.

The initial draft of the Five-year Plan placed stress on exploiting the country's natural resources. However, there is one point here that deserves attention and that has been clearly substantiated by the Japanese and Korean experiences in the field of steel: namely, that domestic sources of raw materials do not automatically translate into international competitiveness. Crude oil and iron ore can be exported as raw materials. However, Viet Nam could face heavy losses and liabilities if the huge capital outlays and other costs associated with transforming those raw materials into finished products are not below the international average. It should be borne in mind that Viet Nam's real strength is in its human resources, not its natural resources. It is of critical importance that the country's industrial policies strive to effectively harness that strength.

Box 4 The bright and dark sides of steel mill investment

High costs have in some instances made steel-mill operations a burden in certain neighboring countries. To give an example, Country M brought a direct-reduced-iron (DRI) steel mill (with 1.2 million tons annual capacity) into operation in the early 1990s. However, the initial investment proved abnormally high. In addition, the vast distance separating the steelmaking and rolling facilities has severely inflated the trucking costs. As a result, the mill is now running a huge deficit, and as a state-run enterprise, it has become an increasingly heavy burden on the government's finances.

By contrast, a comparable DRI plant brought on-line in Country I has been operating well and is now even under study for capacity expansion. Though economic growth has stoked intense domestic demand for steel in both countries, the two projects described above have demonstrated sharply divergent performance in terms of their profitability. The lesson is that even projects for small-scale, integrated steel plants deserve careful study regarding their feasibility.

1. Steel

Steel is a sector that demands enormous initial investments and that has a strong influence on other industrial sectors. Largely for these reasons, steel ventures in other Asian nations have typically been started up as state-run, national projects. The extended lead-times involved in steel-mill construction usually demand that the capital outlays be pursued in line with well-reasoned, long-range master plans. Such undertakings have not always been successful in countries neighboring Viet Nam (see box 4).

Forecasts are that Viet Nam will witness a surge in domestic steel demand during the early years of the 21st century. At that time, it may appear feasible to build a 3-million-ton-class blast-furnace-integrated steel mill. In the event Viet Nam decides to go ahead with such an undertaking, it will be essential to ensure (i) that the project is internationally competitive (e.g., by locating it in a large seaside complex aimed at maximizing the benefits of scale); and (ii) that domestic demand be able to consume a substantial amount of the facility's output. Unless the first of those conditions is met, the country will have to assume a significant share of the costs; that could translate into pressure on the government budget or on consumers themselves. If the second condition is not met, the operation will face heightened exposure to risks stemming from international price trends, and hence, increasingly serious business risk, in turn.

Though it is anticipated that Korea, Taiwan, and other Asian countries will pursue aggressive capacity-expansion programs in the years ahead, infrastructure projects have been fueling steep growth in demand for steel products. For that reason, the shortage of steel in some ASEAN economies is expected to last beyond the year 2000. Demand in the marketplace slackens, though, whenever a new, large-scale facility goes into operation; accordingly, a close eye should be kept on capital investment trends in Korea and Taiwan, two countries that will be positioned to export more of their steel output in coming years. One feature of the steel industry in most ASEAN economies, now, is that electric furnaces and rolling mills produce most of the steel aimed at meeting domestic demand. Another is that steel-related capital-spending plans are concentrated in projects to build or expand medium-scale electric-furnace steel mills (up to 1 million tons annual capacity) and hot-rolling mills.

Domestic reserves of iron ore do not afford a country's steel industry a competitive advantage in the international market, as can be seen from the success of Japan and Korea, two countries which lack such reserves. Essentially, steelmakers in those two countries sought to cut their costs by importing quality iron ore in quantity with special ships, and by engaging in the mass-production of steel at large seaside complexes. Their effectiveness in that undertaking has been substantiated in the marketplace. By contrast, an integrated steel mill built on the assumption that domestic reserves will be its source of iron ore faces the danger of becoming tied to a captive mine and losing its flexibility. In the end, rising costs could force its eventual failure. Accordingly, when planning to build a steel mill that will do business in the international market, the issue of feasibility should hinge on the question of whether it will be able to establish a cost structure that allows it to compete on export prices with counterparts in Japan, Korea or Taiwan.

2. Petroleum refining

Viet Nam has shown interest in establishing and running export-oriented petroleum-refining operations

Box 5 Is petroleum-refining a lucrative business?

As an industrial sector, petroleum refining should be recognized as a business that runs on extremely thin margins. Though the situation may have been otherwise during the oil-shock years, refineries over the past decade have turned an average margin per barrel of only US$1 or so. That works out to around US$30 million per annum, assuming that a refinery processes 100,000 barrels per day, 300 days out of the year. Refineries still have to deduct their interest payments and depreciation costs from that total. Petroleum refining is only one link in the oil business chain, which comprises the acquisition of exploration and extraction rights, exploration and extraction operations, oil production, refining, petrochemicals, distribution, and retailing. It is therefore critical that oil-refining projects properly balance the interests of investors and the recipient country.

near its oil fields. In East Asia at large, however, it is anticipated that such projects will be sited closer to final sources of demand than to oil fields. There are several reasons for that outlook, all having to do with the questionable profitability of export-oriented refining facilities located near oil fields—not just in Viet Nam but in other countries as well. First of all, new facilities of that kind would not be cost-competitive with Singapore, which is currently the region's principal center for exports of refined petroleum products. Second, patterns of oil-product consumption and standards of quality differ by country. And third, such facilities tend to have difficulty in selling the by-products of their refining processes.

Viet Nam also has plans to set up joint-venture refining operations funded with foreign capital. Should such ventures eventually materialize, it will be of the utmost importance to sustain their profitability. Additionally, Viet Nam will have to clear a number of hurdles related to its administrative structures and other issues. Foreign investors who have shown interest in forming joint-venture arrangements may abandon their plans unless Viet Nam can overcome its hurdles and guarantee that such projects will be satisfactorily profitable (see box 5).

In not a few cases, conflicting interests between investors and the recipient country have stalled progress on projects for refineries funded with foreign capital. One refinery project in Country C, for instance, has been put on hold due to just such conflicting interests. Basically, what happened is that foreign investors sought steep payroll cuts as a measure to improve productivity at the refinery in question. Country C was opposed to that, and in reaction demanded a large-scale payroll increase aimed at creating more jobs.

3. Petrochemicals

Burgeoning demand and protective policies in many Asian countries have helped their petrochemical industries expand and develop by leaps and bounds in recent years. Among ASEAN economies, state-run enterprises have been leading a full-scale foray into the upstream sectors of the petrochemical field since the mid-1980s.

Despite the importance of ethylene centers as crucial foundations for the basic materials industry, some of their intrinsic features urge caution with respect to the timing of entry into these fields. First, projects in this field require huge investments, and petrochemical products are extremely sensitive to international price trends. For these reasons, upstream petrochemical ventures tend to carry significant business risk. Second, they will be of questionable feasibility unless the domestic market is developed enough to absorb a substantial share of their output. And third, while they are capital-intensive, they are capable of employing only a relatively marginal share of the labor force (see box 6).

Indonesia, Thailand, and Malaysia have rich reserves of oil and natural gas. As their own track records show, they first cultivated their oil-refining industries and moved to lay the foundations for their petrochemical sectors while drawing on foreign investment to fund the development of domestic ventures in plastics processing and other downstream sectors. Once the downstream sectors entered a growth phase, these countries then decided it was time to build ethylene centers and other upstream facilities.

However, it should be realized that Viet Nam cannot usefully apply the lessons of its neighbors in this area without some adaptation to its own set of circumstances. First, viewing the creation of AFTA, Indonesia, Thailand, and Malaysia have begun moving steadily to liberalize their oil sectors: e.g., by

Box 6 Troubles for new ethylene centers in neighboring countries

In the event Viet Nam decides to build an integrated plant at some point in the future, it will conceivably be designed to produce import substitutes, as has been seen with similar facilities in neighboring ASEAN member-countries. In that undertaking, though, Viet Nam will find it essential to devote enough study to the domestic development pace of plastics processing and other downstream petrochemical sectors. Petrochemical products for export are prone to wild price swings. On top of that, they generally face long periods of sluggishness punctuated by short booms in business. (International prices for most East Asian petrochemical products are influenced primarily by economic trends in Europe and North America, regions that have excess capacity of their own.) The last short-term boom ended about a year ago; prices have since moved into a weakening trend.

Country T did not conduct thorough enough feasibility studies. Largely for that reason, its upstream petrochemical sectors are now heavily dependent on the export market and consequently have been exposed to higher levels of business risk. A 100% foreign-capitalized ethylene center in Country I provides yet another example. Only a small share of its output is destined for the domestic marketplace, and as a poorly profitable export-oriented venture, it is now in financial trouble.

abandoning restrictions on market entry, lowering tariff rates, and lifting ceilings on foreign investment. As a latecomer to the field, Viet Nam has found the international community less and less tolerant of the protective policies it has followed so far. Secondly, Singapore and other countries are now pursuing capacity-expansion plans aimed at expanding their share of the Asian market. It thus stands to reason that cost-competitiveness will become an even more influential factor than ever in determining whether a project is commercially successful or not.

These factors essentially underscore the importance of devoting ample study to the content and duration of industrialization policies that will be within the bounds of international tolerance, particularly when a project is carried to the implementation stage. In addition, they point to the need to carefully gauge whether a project will be cost-effective enough to compete at the international level.

4. Urea Fertilizer

Urea fertilizer plants are highly capital-intensive and, as such, demand appreciable injections of ODA and other foreign investment for their construction. It is therefore essential to carefully examine their feasibility not only in terms of domestic agricultural policy or the use of natural gas, but also with attention to such factors as the outlook for international supply and demand, and the question of whether they will be cost-competitive enough to withstand the ups and downs in international prices.

Annual growth in world demand for urea fertilizer averaged over 5% during the 20-year span to the end of the 1980s. As it happens, that period was marked by an ambitious drive in capacity expansion, with the result that conditions of excess capacity have predominated since. The 1980s witnessed a global glut of urea fertilizer, together with a collapse in the price of naphtha. These developments set the stage for a sharp plunge in the international price (per ton) of urea fertilizer, resulting in fluctuations as broad as $60 per year. During that period, whenever international prices weakened, fertilizer plants not cost-competitive with plants in neighboring countries saw their operations slip below the break-even point and accordingly found themselves threatened with operating losses (see box 7).

An examination of fertilizer-plant earnings structure reveals that essentially three factors influence final production costs: raw-material costs, plant construction costs, and operating rates. Naphtha and natural gas are the principal ingredients used in the synthesis of ammonia, and as such, they are the main components of variable cost. Procuring raw materials domestically and sustaining high operating rates will help plants stabilize their production costs. Domestic agricultural policies and international price trends will be the key factors influencing sales.

Urea fertilizer is a typical international commodity; its price reflects global trends in supply and demand and fluctuations in the price of naphtha and natural gas, the two principal materials used in its manufacture. The past year or so has witnessed a recovery in the price of urea fertilizer, and partly for that reason, plans for new urea fertilizer plants are back in the news. It should be noted, however, that in 1994

Box 7 The hardships suffered by urea fertilizer plants in neighboring countries during protracted slumps

In the mid-1980s, estimates are that the production cost per ton averaged US$180 at a urea fertilizer plant (with annual capacity of approx. 500,000 tons) brought into operation around that time in Country M. Had market conditions forced the plant to ship its output at a price of US$100/ton, it would have faced losses totaling around $40 million a year.

In the late 1980s, Country T had plans to build a new, 670,000-ton-capacity fertilizer plant that would have been a state-run venture. However, the entity that would have been responsible for the plant's operation (the country's National Fertilizer Corporation) was dissatisfied with the findings of a project feasibility study conducted by an international aid organization, and therefore called on a university professor to re-evaluate the project from an impartial standpoint. Though this aroused the public's interest, the project was ultimately called off.

In Country B, the late 1980s saw completion of work on three fertilizer plants (of comparable scale, each with annual capacity of around 500,000 tons) that were designed to utilize natural gas as their chief raw material. When construction work began, estimates were that the three plants would all have production costs of around US$115/ton. Had they been forced to sell their output at under US$100/ton, they would have each been saddled with losses of over $20 million per annum.

and 1995, the former Soviet republics together had excess capacity in the range of 8 million tons, an amount equivalent to over 10% of global capacity. There is a chance that trends in this area of the world will drastically upset the balance of the global urea fertilizer market. In fact, it is strongly likely that the international price of urea fertilizer will remain highly volatile for the next five years.

5. Cement

The products of the four industrial sectors already discussed—steel, petroleum refining, petrochemicals, and urea fertilizer—have status as international commodities. Accordingly, plants engaged in their manufacture tend to be directly exposed to international price competition. Another feature is that such commodities are usually the object of tariffs, price controls, or other protective policies that place a burden on the national economy. Cement, by contrast, is an important basic material used chiefly in infrastructure and buildings. Since cement is bulky and would thus impose high shipping costs, the industry is fundamentally "indigenous." In addition to these factors, though, it should be noted that Viet Nam is endowed with extensive limestone reserves, and that the domestic construction boom has fueled a sharp expansion in demand for concrete, presenting favorable market conditions for the siting of domestic cement plants.

Though cement plants typically require less investment than do plants in the petrochemical or steel sectors, they are machinery-driven undertakings nonetheless, and accordingly require lengthy periods before they begin to show a return on investment. At present, financial difficulties have limited efforts in capacity expansion by Viet Nam Cement Corporation. Furthermore, the current difficulties involved in mobilizing domestic private-sector capital essentially mean that new undertakings in capacity expansion will have to depend on direct investments from foreign firms.

While foreign investors are attracted by the above-noted factors characterizing Viet Nam's domestic business climate, some have expressed concern about the stability and transparency of policies influencing cement prices and the outlook for electric utility rates. In addition, some feel that seaside cement plants in Viet Nam could be cultivated into internationally competitive hubs for cement exports. However, the influx of foreign direct investment could end up hampered over the longer term if foreign companies are saddled with an excessive share of the cost burden associated with the development of port and transport facilities and other elements of essential infrastructure.

Policies for the cement industry should take into account the indigenous features of the sector itself and allow for finely tailored capacity expansion plans shaped by forecasts of local demand. In view of the high shipping costs, local fluctuations in supply and demand could undermine the stability of corporate earnings even if the market is balanced at the national level. In any event, the favorable conditions for the sector suggest Vietnamese entrepreneurs could enter the cement business once the domestic private sector accumulates enough capital. On-site mixing of cement delivered in dry, bag form by truck is the standard

pattern of cement consumption in Viet Nam. Accordingly, steps to cultivate the cement industry could also be expected to promote the development of indigenous cement packing and trucking operations and other downstream processes that would provide more jobs to engage the labor force.

IV. Bottlenecks to foreign direct investment

Foreign direct investment (FDI) has been the indispensable element of economic growth in ASEAN countries and will be so in the case of Viet Nam, too. In 1995, 394 projects (excluding Oil and Gas) were licensed for US $ 6.6 billion, which is 62% more than in 1994. In contrast to this rapid increase, implementation or actual investment is not growing as fast as license approval. The accumulated implementation rate declined to 39% in 1995 from 60% in 1991. This decline is mainly due to the increase of the weight of manufacturing projects, which require several years to implement, but might partly reflect desatisfaction of foreign investors with the current situation of Viet Nam.

A standard procedure for FDI has not been established and foreign investors have to cope with situations case by case. In order to analyze this "many door" environment of FDI, we divided the flow of investment activity into three stages. First stage: Getting investment license, Second stage: Construction of plant, Third stage: Business operation.

In the first and second stages, various administrative problems were pointed out. Among them quite noteworthy is the issue which might relates to the reform of state-owned entaerprises (SOEs) in Viet Nam. In fact, applications for projects viewed as having the potential to infringe on the interests of existing state-owned enterprises (SOE) have in the past been turned down, or their applicants pressured to alter proposed equity stakes or project content (see box 8).

Our study is mainly focused on the third stage, as interviewees were those whose businesses are already in operation. Most widely observed complaints were; a) it takes time and effort to acquire import licenses of input materials for production from the Ministry of Commerce and concerned ministries, b) high import tax for parts has created obstacles for foreign affiliated companies, and c) accumulative turnover tax is penalizing the development of domestic production. These factors lead to an increase in the price of products and reduce their competitiveness.

Throughout stages, each ministry deals with both informal discussion and application from foreign investors, basically case by case. A yardstick of one ministry sometimes contradicts the measure of another. As a result, foreign investors tend to perceive that there is no one consistent policy for FDI, reducing the attractiveness of Viet Nam.

V. Problems of small and medium enterprises and rural industries

Rural farm households account for the majority of Viet Nam's population. Owing to the emphasis on regional balance, the country considers rural industrialization and the development of small and medium enterprises (SMEs) to be especially serious policy challenges. To be sure, SMEs and rural industries have an important role to play on several fronts: creating new job opportunities, developing the supporting industries for machinery, electronics, and other modern sectors, contributing to an improved balance of payments through heightened finished-product exports and the import substitution of intermediate goods, in rural modernization and poverty alleviation, and in alleviating disparities between urban and rural areas. Japan and other neighboring Asian countries valued the role of SMEs in their economic development and, from the perspective of enhancing their market economies, they all moved at a comparatively early stage to actively promote SMEs.

Viet Nam's efforts in this area, however, have only just begun. Small and medium enterprises and rural industries in the country currently face a plethora of difficulties, and still appear unable to fully exercise their latent potential. The findings of this provisional joint study and of past studies all suggest that rural

Box 8 The relationship between promotion of foreign direct investment and reform of state-owned enterprises

Measures to overhaul Viet Nam's SOEs should be pursued within the context of the larger, national strategy for industrialization. It should be noted that it will take time to establish effective systems of social insurance or frameworks supportive of a market economy. On that basic understanding, Viet Nam has the option of aiming for a soft landing based on the two-track approach demonstrated by China: namely, by (i) revitalizing its SOEs while (ii) simultaneously working to cultivate its non-state-owned corporate sector. To that end, efforts would be centered on establishing a business environment that allows state and non-state enterprises to compete fairly with each other on a "level playing field." In a country with the scarcity of private entrepreneurs Viet Nam currently suffers, it may be necessary to pursue joint-ventures between SOEs and foreign investors, the chief objective being to enhance the management efficiency of the former. In certain respects, FDI approval policy in Viet Nam seems guided by a desire to protect the interests of existing SOEs. Continued reliance on this sort of protective policy, however, would not only preserve the entrenched inefficiencies of SOEs, but would also discourage foreign investors and hence hinder steady inflows of FDI—now a key ingredient of Viet Nam's strategy for industrialization.

industries and SMEs in the manufacturing sector face problems of the following kind.

First is the shortage of capital. Though bank loans to the private sector have recently been on an upswing, they seem limited in their scale. Hence, while many SMEs and independently run businesses have plans to expand, they lack the funding to put those plans into action. In some cases, it is difficult even to obtain access to bank credit. Moreover, since most financing is short-term and carries high interest rates, SMEs that do have access nonetheless find it difficult to obtain medium- and long-term financing. Viet Nam needs to devote study to its financing frameworks for SME operations, including steps to establish a system of credit guarantees.

Second is the scarcity of market data. Many SMEs appear to be seriously frustrated with the lack of information, particularly on domestic market sectors exhibiting growth in demand. This situation seems to urge that consideration be given to mechanisms for the sharing of information on the Vietnamese and foreign markets.

Third are the difficulties involved in securing sites for industrial operations. This problem exists nationwide, not only in and around Hanoi or other large cities, but also in smaller cities. In fact, many businesses find it almost impossible to expand their facilities in order to meet burgeoning domestic demand or orders from abroad. For this reason, they are unable to deal with existing noise and air- or water-pollution problems. Viet Nam should explore the possibility of developing industrial parks not only for foreign companies, but for its SMEs as well.

Fourth is the need for management consulting and assistance in product quality control, productivity enhancements, and so forth. Most SMEs in Viet Nam lack management experience or expertise, and thus need help with their managerial affairs when preparing to expand. This situation calls for efforts to increase the availability of management assistance services, for instance, as offered through local chambers of commerce and industry.

A fifth problem, and one that is related to the scarcity of information on foreign markets, is the difficulty SMEs face in directly exporting their products. Export licensing requirements, export quotas, and complicated export procedures all form a bottleneck that effectively forces most SMEs to export their products through state-run trade corporations or SOEs instead. That approach, however, prevents them from gaining direct contact with foreign buyers, and from enjoying the many benefits such contact could afford, including information on foreign market conditions and the acquisition of essential expertise. Small and medium enterprises have also seen their export potential inhibited by the lack of an export-financing system.

Yet another problem, albeit not one faced only by SMEs or rural industries, per se, is the underdeveloped state of Viet Nam's legal code and other elements of business infrastructure. Though efforts to lay its legal foundations are moving forward at a feverish pace, the country has yet to put the finishing touches on its commercial code. Not only that, but some of the newest laws on the books are simply too generalized, making them virtually impossible to enforce in practice. Though the country has sought to compensate with decrees, ministerial ordinances, and administrative guidance, these efforts have been widely criticized for the

lack of transparency characterizing their application. The tax code is also a general problem, and one that affects large companies as well. The high tax rate on corporate profits, along with the sales tax and a host of other taxes as well as additional fees collected by government agencies, together have a stifling effect on private-sector business activity. The government has decided to offer tax breaks for businesses engaged in priority fields by revising the profit tax and establishing laws on domestic investment. At present, though, many companies are unable to benefit from any of the incentives ostensibly offered by these legislative changes.

The joint study also found problems with the underdeveloped state of infrastructure (particularly the road networks utilized by rural industry), competition with black-market goods, the shortage of skilled engineers and other professionals, and the backward state of education in rural areas.

In view of the importance of the country's SMEs and rural industries, the Vietnamese government should first come up with active policies of assistance. Next, it would seem essential to put some institution in charge of all the administrative affairs relating to SMEs and rural industries, and to strive to establish an effective administrative system. Once that framework is in place, it will then be necessary to address the problems cited above in earnest.

VI. Participation in AFTA and APEC, and the expected impact on Viet Nam

In terms of industrial policy, Viet Nam faces unprecedented pressure to pursue its industrialization within new, unified regional economic frameworks, such as AFTA. Over the long range, it appears that the country's deregulation-led participation in international trade will be an essential condition for its industrialization-led economic advance and eventual transformation into a full-fledged market economy. As other East Asian countries have demonstrated from experience, deregulating trade and investment is a vital part of economic development strategy. Viet Nam should view participation in AFTA and APEC as steps along the path to trade and investment deregulation that will be integral to its long-range policies of industrialization.

AFTA has been engineered to foster opportunities for trade particularly within the ASEAN community, and to encourage expanded inflows of foreign direct investment. To that end, AFTA member-states will take steps to deregulate intraregional trade and investment and cut the cost of doing business with each other by standardizing their legal codes and other institutional frameworks. Participation in the AFTA framework will afford Viet Nam opportunities to boost its exports and lure in more foreign investment, while at the same time allowing it to compete with other countries region-wide.

AFTA participation can be expected basically to have the following effects. In their intraregional trade, AFTA member-countries will be able to expand their exports due to lower tariff rates; reduce the cost of imports of raw materials, parts, and capital goods; and improve the efficiency of their domestic manufacturing bases through competition with imports. Also, measures to deregulate foreign investment can be expected to widen the influx of foreign investment from countries outside the AFTA community. In addition, steps to deregulate intraregional trade will likely have the following, indirect effects on foreign direct investment: i.e., boost levels of investment aimed at expanding exports to AFTA countries; cut back on levels of investment for domestic manufacturing projects in countries whose markets have to date been protected by high tariffs; and cut back on investments in exports destined for markets outside the AFTA community.

The strength of these effects will depend on the initial economic conditions and competitiveness of the AFTA country in question. To be sure, the benefits of trade liberalization will be limited in countries that do not yet have an adequately functioning market economy or that still suffer bottlenecks in funding, technology, or infrastructure. Prior to joining AFTA, most countries of the region other than Viet Nam had already moved on their own initiative to deregulate trade and investment, and had track records of rapid economic growth. In that sense, Viet Nam will be a latecomer to the fold. Accordingly, it faces the

challenge of exploiting the opportunities provided by AFTA participation and surmounting the hurdles to its satisfactory enjoyment of the potential benefits therefrom.

In effect, Viet Nam differs from other countries already party to AFTA in that it bears the following set of initial conditions. (i) It is still an economy in transition. (ii) It is still in the early stages of its economic development. (iii) AFTA participation will demand that it pursue more extensive, far-reaching measures in structural adjustment (deregulation). (iv) It is heavily dependent on AFTA countries for trade (20% of exports, 30% of imports). During the deferment period for implementation of deregulation measures, Viet Nam will face the necessity of doing everything within its power to address the above shortcomings in its initial conditions, and compete openly with other countries of the region.

Harnessing foreign direct investment will be one of the most effective and important vehicles Viet Nam can utilize to that end, as the rapid pace of industrialization in other ASEAN countries has already shown. Foreign direct investment can play an instrumental role in offsetting Vietnamese deficiencies in such resources as technology, financial might, and management expertise; enabling the country to more quickly draw on its latent comparative advantages, e.g., in terms of quality human resources; and fostering domestic gains in business efficiency. To ensure that foreign direct investment effectively serves these ends, however, it is essential that Viet Nam take steps to establish a fundamentally sound investment climate rather than focusing its priorities in selected projects alone. That is to say, the country needs to develop and improve on its infrastructural essentials for industry, transportation, and telecommunications, establish suitable legal and tax frameworks for investment, streamline its administrative procedures, and pursue policies in macroeconomic stabilization.

Essentially the same arguments will hold for participation in APEC. What is more, the benefits of APEC participation will be even broader in their scope, including regional economic assistance in human resources development and technical assistance programs; assistance for the development of a market-oriented infrastructure; and most-favored-nation treatment from the U.S. and other APEC member-countries. At present, the terms for participation appear less stringent for APEC than for AFTA. For instance, 2020 is the deadline for full regional liberalization, and the deferment periods can apply to a broader set of conditions. Given these features, it seems advisable that Viet Nam actively explore the prospect of participating in APEC as well.

Generally speaking, Viet Nam should strive to maximize the benefits of participation in AFTA and APEC (and eventually, in the WTO). To be sure, international confidence in the future of Viet Nam's economy can be expected to climb, provided it demonstrates an enthusiastic attitude toward participation. While the terms for participation do not appear easy to satisfy, Viet Nam will still have some flexibility regarding the timing, speed, and content of any measures it actually pursues in the arena of deregulation. The prime expectation of countries in their early stages of economic development will be that they demonstrate a medium- or longer-term commitment to the liberalization process. Multilateral and bilateral negotiations on actual deregulation timetables and exemptions (temporary grace periods, at the very least) will still be possible.

2
Some Comments on Draft Report of Industrial Policy

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I. The report has a overview chapter of economic growth and industrial policy in Japan, East Asia and ASEAN countries, the lessons include

- Role of the Government regarding to economic policy in general and industrial policy in particular. Experiences of other countries showed it had clear point of view of the Governments intervention in economic and industrial development policy which can not let make all of decisions by market, especially for Viet Nam, where market mechanism have been in the first development period.

- Different way and various method of industrial policy in each country, depending on international and internal conditions in that time. However, it could be seen the industrialization process coming up in the countries of region as follows:

+ It have taken place a wave of technology classification in category. While the advanced countries seek and develop modern technologies, the latter ones gain on advantages of labor and low labor price to accelerate the exportation of products with low and labor intensive technology.

+ East and ASEAN countries have implemented industrialization process under four steps:

* Import-substitution in first stage (light industrial products);
* Exporting in the first stage(products with laborintensive and low technology);
* Import-substitution in second stage (heavy and chemical industry);
* Exporting in second stage (products of heavy industry and high technology);

- These countries get considerably successful in export-oriented strategy.

Countries experiences had been summed up in economic development history is useful lessons to Viet Nam. It also helps Viet Nam considering it's actual situation in order to map out appropriate orientations and solutions in accodance with objective conditions.

However, if the report made a comparision between international background of the period in which countries were realizing industrialization and changes of the present international situation, it would create a large signification regarding to applying in Viet Nam.

2. Concerning the selection of prior industries

- Authors have displayed arguement to select prior industries, to enhance development of potential ones, it is:

+ Technological characters, relationship between capital, labor and technology content.

+ Making good use of comparable advantages, natural and labor resources of country international association with considering the experiences of regional countries together with investor's opinions.

+ Meeting upstram and downstream relations of that industry.

+ Export orientation or import substitution.

It's good principles which can be applied to search which are prior industries in Viet Nam.

In present international situation, transferring from low technology and labor-intensive industries to labor-intensive ones, but with high technology is appropriate to Viet Nam. It not only ensures characters in age but also contributes to solve labor surplus situation in Viet Nam, even disguided unemployed in rural areas, and to be the way of economic growth due to exploitation of advantages in industries producing the exporting goods. Because, the real strong point of Viet Nam is labor force, not natural resource though it also plays important role. The above mentioned problem is quite correct, so all of policies, investment directions and interactions to implement should concentrate on this direction.

That why we agree with author's proposals of transferring the Viet Nam industries, from labor intensive but low technology to labor intensive and high technology. It's also good suggestion for the following studies, more concretely to select prior industries in strategy of Vietnamese industrial development.

3. It's necessary to pay special attention closely to both of selecting

Sector, scale, structure, technology and considering the location during developing heavy industry's fields. These are necessary and play an important role for a large scale population country as Viet Nam.

So the deep analysis of Five basic industries which required a large capital content is important contributions to us (Five industries include cement producing, metallurgy, oil refinery, oil chemical and fertilizer ons). Report has provided a lot of information about world marketdirections of successful and failure experiences of some countries in developing these industries.

Viet Nam government also have been considering to develop them in order to stimulate natural resource advantages, especially for industries making rawmaterial. We agree with the viewpoint that it's necessary to discuss on the industries development is needed or not, but it's prudent to research when, where and how to do it?

There're indirect and direct efficiencies of setting up these important industrial estates and also social economic efficiencies for creating a new economic developing area. Because it is the sector requiring a large investment and having a risk coefficient, it should have protective incentive policies international some first years to accelerate investor.

The engineering industry is an important field international industrialization process of each country. It also have the same position in Viet Nam because of its necessarily unleaving mechanization period. That's why we hope Japanese professors and experts would analyze more in the field of engineering industry., especially the car assemble and manufacturing industry with it is perspectives and challenges. It's one of the industries having tendency to develop international Viet Nam.

4. Done research on small and medium industry and rural industries is important and needed. Although in initial step with a little volume of survey but overall assesses had been made an pointed out the main problems, limitation and obstacles for these kind of industry in Viet Nam.

The report fully summarized the survey documents, reflected basically the development situation of small, medium and rural industries in Viet Nam. However, this is really big problem, relating agricultural and rural industrializaton in Viet Nam, it should have to be more extremely...studied.

5. Proposals for continuous research on second stage

- It should continue to research more intensively in developing small, medium and rural industries in Viet Nam. Experiences of the two-level industry could be useful lesson to Viet Nam.
- The associatong industry with trade policy in order to develop a industry oriented to exportation., promoting the comparable advantages of Viet Nam in region and in the world.
- Selection of key industries in Vietnamese strategy of industrial development should go on studying.
- It should seek the way to increase efficiency of state-owned industrial secter.

These above ideas are suggestions of some members of the group. The subject selection on researching should take hight-level's opinion with a more general envisagement.

3
Exploring Leading Industries of the Next Generation in Viet Nam
— In Search of Feasible Industrialization Strategy —

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I. Introduction

The main purpose of this paper is to illustrate the way to examine which industries would be promising or likely to become leading industries in the next decade, taking into account the basic country conditions, expected problems and opportunities in Viet Nam.

The period between 1996 and 2000 is described as "a very important step in the industrialized and modernized development period of the country" by the Vietnamese government. This basic orientation makes industrialization strategy as a central agenda. Although one of the focal points in this subject is the role of the state or "what kind of policy measures are to be adopted in order to nurture industrial development", this paper is going to focus the attention on the identification of promising industries or "how to identify industries which will play leading roles in the next generation".

Under the present conditions of the Vietnamese economy, it is not advisable to assume that market mechanism or private sector alone could shoulder the burden of industrial development, as either market mechanism or private sector is still in the very early stage of its development. Inevitably the state should play an important role in industrial development. Otherwise it is not realistic to expect the achievement of the abovementioned goals. This is the reason why industrial policy , i.e. government interventions in the attempt to create a desirable industrial structure and finally to increase economic welfare, is adopted as an important agenda in Viet Nam.

When we review the studies of industrial policy, we find a wide diversity of opinions. There are advocates and non-advocates. The latter argue that sound macroeconomic policy or "getting fundamentals right" is the crucial condition of the success of industrial development. The advocates could be classfied in two groups in terms of approach. One is a "functional approach", which stresses the policy measures dealing with entire industrial sector (instead of an individual industry), especially for export development and technology development, in addition to getting fundamentals right (for example Bhattacharya and Linn 1988 p.xi). The other is a "picking winners approach", which tries to promote specific "sunrise" industries through selective government support (one representative case is the promotion of heavy and chemical industries in Korea). In either case, it is crucial, in our opinion, for policy makers to have a correct future prospect of industries in their econimy.

Generally speaking, the arguments of industrial policy have focused the one word on the rationale (theoretical basis), the contents of policy packages, and the assessment of policy measures. It should be pointed out, however, it is necessary to pay due attention to one of the key elements for the success of industrial policy. That is to examine which industries would be promising taking into account their own country conditions. It is apparent that implementing policy measures without reliable "sea-chart" regarding

the future prospects of industries will lead to fatal misallocation of resources under a selective intervention.In the case of a functional approach too, without such information, the result of the evaluation of investment plans would be misleading.

From this viewpoint, this paper is going to explore the way to identify the promising industries so as to make industrial policy feasible in Viet Nam.

II. Theoretical framework of choosing promising industries

There are several basic steps to be taken for the selection of promising industries: ① to recognize the characteristics of each industry, ② to consider the impact of the expansion of each industry on the whole economy, ③ to examine the country conditions, ④ to review the experiences of other economies, and ⑤ to study the opinions of the market.

1. Technological characteristics of industries

It is possible to grasp the features of industries using the following two axes as shown in Figure 1:

(1) Capital or labor intensiveness

It is known that the capital-labor ratio of the optimal production process shows a wide variety of difference among industries. Table 1 shows that such industries as chemical, steel, and automobile are more capital intensive and less labor intensive than textile, wood products, and food industries. We have to take into consideration, however, that such features of production process differ from one country to another, because of the differnt cost structure of inputs. When the (the wage rate)/(the capital cost) is lower, in other words, when the wage is low relative to the cost of capital, the more labor a firm will use relative to capital.

(2) Technology intensiveness

Level of technology is not same among industries. Some industries such as aircraft and electronics are called "technology intensive industries" because of their sophisticated technology. These industries tend to have higher value added than others. While it is argued that technology intensiveness could be measured in terms of the R&D (research and development) expenses ratio to revenue (seeTable 2), it is not easy to quantify. For example, in Table 2, the said ratio of steel industry does not seem to reflect the technology level of that industry.Under the circumstance, this paper prefers to adopt commonsense to describe technology intensiveness of industries.

When we plot the feature of specific industry on the format of Figure 1, it should be taken into account that the "appropriate technology" for a industry differs from one country to another, in accordance with the availability and cost structure of inputs. In developing countries such as Viet Nam, the appropriate technology should be less capital intensive and less technology intensive than the cases of industrialized economies, as shown in the experiences of labor intensive adaptation in Japan (Ishikawa 1979, p.84-94).

2. Impact on the whole economy

It is noted that some industries have relatively large positive impacts on macroeconomy when they grow. In Japan, an argument that it is desirable to support such industries with larger impacts has been popular. The following criteria are used to illustrate the features of such industries:

(1) Income elasticity of demand

The income elasticity of demand is the percentage change in quantity demanded caused by one% increase in income. As a result, an industry with higher income elasticity is expected to effectively contribute to the whole economy, due to larger responsiveness to economic growth or the expansion of the world market. According to Miyohei Shinohara, the income elasticity of heavy industries,in particular machinery industry, is higher than that of light industries (Shinohara 1976 p.32). From this viewpoint, the importance of the promotion of such industries was repeatedly stressed in Japan (Goto and Irie 1994 p.32-33).

(2) Scale economy or Marshalian externality

As a result of the increase in the production of an industry, the cost curve of each firm in that industry tends to shift downward, and the price also declines. This phenomenon, which is called "Marshalian externality" is crucial in industrial develoment, as it enhances international competitiveness. In order to realize Marshalian externality, however, it is necessary to bear the "set-up cost" during the initial stage. It is not realistic to assume that the private sector could shoulder this burden.

Marshalian externality is found in capital and/or technology intensive one word, particularly heavy and chemical industries. (Ito, Kiyono, Okuno, and Suzumura 1984, p.234-242)

(3) Forward and backward linkage effects

The interindustry relations can be illustrated through forward and backward linkages. When the growth of industry A increases the demand for intermediate goods, which are produced by other industries, industry A has backward linkage effects. When the growth of industry A increases the supply of intermediate goods for other industries, industry A has forward linkage effects.

Once Hollis Chenery and Tsunehiko Watanabe classified the features of various industries in four groups in terms of forward and backward linkage effects, based on the statistics of US, Japan, and Italy, as shown below (Shinohara 1976 p.43):

1) High forward and backward linkage effects
   steel, non-ferrous metals, petroleum products, chemical, textile etc.
2) High backward and low forward linkage effects
   leather products, wood products, apparel, transportation machinery, machinery, foods, ship building etc.
3) Low backward and high forward linkage effects
   mining, oil and natural gas, coal, agriculture, electricity etc.
4) Low backward and foreward linkage effects
   fishery, transportation, service, and trade

During the early stages of industrial development, the industries with higher backward linkage effects (group (a) and (b)) make important contribution, as the production of intermediate goods are stimulated.

Recent study by Ikuo Kuroiwa on Thailand and Japan basically adopts different classification (Table 3). It is, therefore, not easy to compare directly these two studies. As far as two manufacturing subsectors sharing same classification, that is machinery and transportation machinery are concerned, Kuroiwa's study basically supports the statement of Chennery and Watanabe. At the same time Kuroiwa's study suggests that the figures tend to show significant gap between Thailand and Japan, as far as non-manufacturing subsectors are concerned.

(4) Job creation effects

The necessary amount of labor input for one unit of prodution, which is caled "labor input coefficient", provides an idea of the size of jobs, being created by the expansion of an industry. Figures in Table 4 show the situation in Japan, and suggest that job creation effects could be high in such industries as publishing and printing, wood products, leather goods, textile, metal products, precision machinery, and low in such industries as petroleum products, chemical, and steel. Needless to say, job creation is highly important for Viet Nam which suffers from huge underemployment.

3. Factor endowment

As is well known, Viet Nam is quite rich in human and natural resources. The former includes entrepreneurs, managers, engineers/technicians, skilled labor fource etc., which are crucial in the development of labor intensive industries, in particular. Although we cannot deny the importance of natural resources, it should be admitted that it has persistently declined particularly as a result of the success of coastal industrial complexes with deep sea ports in Japan and Korea, who are poor in natural resources. However, this is still crucial when transportation cost of raw materials is high relative to total production

cost. Perhaps cement industry could be a representative case.

4. Exploration of dynamic comparative advantage

When we consider the dynamic prospect of comparative advantage of the Vietnamese industries, the experiences of East Asia, particularly ASEAN countries, provide ample important hints, because the initial conditions of these successful economies are not too different from the present situation in Viet Nam. Perhaps,it is realistic for Viet Nam to try the replication of what occurred in ASEAN in pursuit of the appropriate path of industrialization.

For this purpose, it is useful to analyze the trends of the following indicators, as they are supposed to reflect the stractural changes in comparative advantages in ASEAN:

1) Revealed Comparative Advantage (RCA)

$$\frac{\text{(Export of commodity j by country i)/(Total export by country i)}}{\text{(Export of commodity j by the world)/(Total export by the world)}}$$

2) Revealed International Competitiveness (RIC)

$$\frac{\text{(Export)} - \text{(Import)}}{\text{(Total production)}}$$

3) Effective Exchange Rate

$$\frac{\text{(Foreign price of the commodity)} \times \text{(Nominal exchange rate)}}{\text{(Domestic price of the commodity)}}$$

In this paper, we are going to choose one of these indicators, revealed comparative advantages (RCA), to illustrate what occurred in three ASEAN countries(Thailand, Malaysia, Indonesia) and Korea, during the period between 1982 and 1992. Table 5 shows the list of commodities, which showed "persistent and significant upward trends" and "persistent and significant downward trends" of RCA. This table shows the following features:

(1) Although Korea has various "sunrise" and "sunset" commodities, ASEAN3 have many sunrise commodities and limited number of sunset commodities. All of these sunset commodities in ASEAN3 are primary goods except one.

(2) ASEAN3 have shown rising comparative advantage particularly in the following areas:

① electric machinery and electronics

② textile goods and apparels

③ processing primary goods :pottery, materials of rubber, wood manufactures etc.

④ labor intensive fabrication :footwear, jewery, sporting goods etc.

(3) Most of sunset commodities in Korea are sunrise ones in ASEAN3. If we focus our attention on the period between 1987 and 1992, additional items in the areas of electric machinery and electronics, such as television and radio receivers, also fall in this group. To put it differently, a lot of export goods of Korea have been replaced by ASEAN3. It should be pointed out, at the same time, that Korea is promoting new sunrise commodities, which need more sophisticated technology.

5. Opinions of foreign investors

Whenever we explore promising industries, the viewpoint of private sector is really crucial. Past experiences in many countries show that the selection of so-called "strategic industries" by government officials led to many monumental but unprofitable "white elephants". Particularly, the opinion of potential investors are the key elements when we scrutinize the feasibility of a specific industry in Viet Nam, as they will seriously check their own risks and opportunities. However, when we listen into the opinions of (potential) investors, we must be careful to examine whether the investor's opinion is based on the condition of protection measures. If this is the case, his opinion should be discounted. As a matter of fact, our preliminary interviews with Japanese businessmen show the fact that many investment plans being considered among them assume protection measures.

In the later stage of our study, we will conduct more extensive in depth study on the attitude of foreign investors.

III. Identifying promising industries in Viet Nam : feasibility vs desirability

When we try to identify promising industries in Viet Nam, it is advisable to perform the task from two viewpoints: feasiility and desirability. On the one hand, it is important to confirm that building an industry is feasible economically and commercially, taking into account the specific conditions in Viet Nam. On the other hand, it is valuable to envisage the future prospect of industrial structure, which will fully work out the potentiality.

1. Feasibility (part 1)

The candidates for promising industries must economically and commercially feasible. Otherwise there will be many fiascos or white elephants. In the assessment of feasibility, as was shown in II, the following three variables are especially crucial:

1) the experiences of neighbouring countries, in particular ASEAN members
2) the opinions of potential investors
3) factor endowment or availablity of resources in Viet Nam

We have identified the four major areas with rising comparative advantages in ASEAN3, in II: ① electric machinery and electronics, ② textile goods and apparels, ③ processing primary goods (particulary agro-based products), and ④ labor intensive light industry products, other than ② and ③. Let us review how these areas became promising ones.

Table 6 shows that, in 1982, most of major export goods in ASEAN3 were primary goods (raw or simply processed). By 1987, however, ASEAN3 began to diversify their export goods. This new direction is reflected in the fact that various non traditional export goods began to increase the comparative advantages rapidly. Although, according to Table 7, most of them were still closely related to primary goods, many others were evolving in the areas ① , ② , and ④. These "first generation sunrise commodities" were in the group of labor intensive industries, and some of them such as television receivers were technology intensive. After the Plaza Accord of autumn 1985, Yen appreciation led to huge foreign direct investment to this region and created "second generation sunrise commodities".Table 8 shows that these commodities were not necessarily related to primary goods; many, including sophisticated products, were in the areas of SITC Code 700s and 800s.

These experiences of ASEAN3 seem to be relevant to Viet Nam, especially when we take into consideration the fact Viet Nam have ① affluent agricultural products and ② mineral resources as raw materials, and above all ③ well educated and hardworking human resources, who are mostly in underemployment. According to our preliminary interviews, the potential investors in Japan basically share this view.

In summary, a feasible path of industrialization in Viet Nam could be to build labor intensive (less technology intensive) industries at the beginning, utilizing domestic raw materials, particularly agricultural products, and afterwards to shift to more sophisticated labor intensive industries, as is shown in Figure 2. Seemingly this view is shared by Viet Nam, as the importance of the industries based on agricultural products or other primary goods as well as light industries is stressed in the draft Five-year Plan.

2. Desirability

In II, we found that some industries can make larger contribution to economic development than others. The essential points are shown below:

1) Heavy and chemical idustries, in particular machinery, have larger income elasticity of demand.
2) Capital and/or technology intensive industries such as heavy and chemical industries have larger

scale economy or Marshalian externality.

3) A wide variety of industries have higher backward likage effects. These industries are composed of heave and chemical industries, labor intensive light industries, and the processing of natural resources.
4) Labor intensive industries have larger job creation effects.

These findings lead to a policy implication that "capital intensive idustries with higher technology intensiveness" can have various macroeconomic impact, if these are feasible. The Draft Five-year Plan's emphasis on some heavy and chemical industries is compatible with our findings. However a caution should be excercised that investing in heavy and chemical industries is desirable only if these industries are economically and commercially feasible. It is to be reminded that many developing countries have attempted to promote these industries and quite often failed. Under the circumstance, it is crucial to assess the feasibility of particular idustry or project very carefully. This issue is to be treated in the following section.

3. Feasibility (part 2)

Generally speaking, heavy and chemical industries have higher risks in comparison with light industries. In this regard, it is useful to learn from the experiences in ASEAN countries, as they have suffered from difficulties in the operation of plants in these sectors. The representative cases are the serious troubles in fertilizer plants in Thailand, Malaysia and Indonesia in the mid 1980s and the recent steel mill case in Malaysia. Although the latter is basically due to the problems in basic desingning, the former illustrates an endemic difficulty in capital intensive industries.

There are two basic reasons why cpital intensive industries are accompanied with higher risk. First, product differentiation is less important. In the case of labor intensive industry's products, it is possible to sell a product of lower quality if the price (or cost) is less, and vice versa. However, in capital intensive industries, world-wide competition is based on price or cost. As a result, a limited number of giant suppliers tend to become dominant in the international market, and smaller producers become "marginal" suppliers. For example, Japanese and Korean steel mills are dominating and refinaries in Singapore have overwhelming influences in Southeast Asia.

Second, large and frequent fluctuation in international prices (see Figure 3 and 4, which illustrate what occurred in steel and fertilizer industries) tend to hit marginal suppliers very hard. In mid 1980s, when the internatonal price of urea fertilizer was in slump, several fertilizer plants in ASEAN region, including an ASEAN industrial project in Indonesia and the Bintulu fertilizer plant in Malaysia suffered. In Thailand, the National Fertilizer Corporation's fertilizer plant was forced to be cancelled.

Crucial steps in the feasibility study of capital intensive large scale plant is ① to review historical record of price fluctuation and ② to calculate a break-even point, i.e. the sales amount which just cover the fixed and variable cost of particular plant under the planed utilization rate. A comparison between the time series data of international price (or the probability distribution of such prices) and the break-even point provides an idea in what probability the plant can be profitable. If the probability is low, it is advisable not to launch the project.

In the meantime, it is possible to reduce the fixed cost through providing incentives (preferetial tax treatment, credit with a subsidized interest rate,etc.). Such governmental support could be accepted if the following conditions are met:

1) the policy measures are compatible with the WTO system
2) the incentives are applied to particular policy objective (for example, technology development), or particular industry, instead of particular firm
3) there is a good prospect of learning effects and lifting such governmental support within a reasonable period

However, it should be pointed out that many developing countries have had "wishful thinking" in

calculating the probability of survival of their capital intensive industries or in evaluating the rationale of governmental support.

IV.Closing remarks

This paper has focused the attention on the method of choosing promising industries in Viet Nam. This focusing was made, as, in our opinion, the detailed and practical explanation of the way of identifying promising industries is not found in the relevant articles usually. We could not afford to deal with policy measures aspects to foster industrialization. We hope to have another chance to tackle this important issue.

A central concept in this paper is "feasibility". We stressed this concept, as the identification or selection of leading industries in the next generation is usually done from so-called "strategic" viewpoint. Although it is valuable, a strategic viewpoint tends to be misleading and lead to fiasco unless a realistic viewpoint is adopted to counterbalance, taking into the particular country conditions as well as the information of international market. The concept of feasibility plays an important role in the counterbalancing.

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Table 1 Capital and labor intensiveness : the case of Japan

	(Capital Stock)/(Revenue)			(Labor)/(Revenue)		
	1970	1980	1990	1970	1980	1990
Food	0.102	0.098	0.145	0.060	0.076	0.084
Wood & Wood Products	0.090	0.081	0.102	0.118	0.128	0.125
Textile	0.128	0.097	0.133	0.171	0.172	0.182
Leather Goods	0.070	0.052	0.066	0.180	0.198	0.169
Paper and Pulp	0.229	0.203	0.303	0.053	0.056	0.062
Rubber and Plastic	0.199	0.140	0.225	0.102	0.101	0.088
Chemical	0.332	0.211	0.265	0.039	0.038	0.035
Petroleum Products	0.200	0.090	0.157	0.005	0.002	0.005
Metal Products	0.141	0.116	0.178	0.124	0.125	0.128
Non-Ferrous Metal	0.223	0.208	0.254	0.032	0.034	0.041
Steel	0.221	0.229	0.250	0.018	0.022	0.025
Machinery	0.170	0.164	0.182	0.073	0.091	0.079
Electrical Machinery	0.139	0.128	0.195	0.083	0.089	0.072
Automobile	0.280	0.187	0.252	0.061	0.059	0.060
Ship Building	0.227	0.246	0.205	0.087	0.089	0.076
Precision Machinery	0.159	0.134	0.218	0.133	0.130	0.118

Source : Urata & Kawai 1995

Table 2 Technology intensiveness : the case of Japan

	(Research & Development Expenses)/(Revenue)		
	1970	1980	1990
Food	0.01	0.14	0.17
Wood & Wood Products	0.00	0.08	0.21
Textile	0.00	0.08	0.21
Leather Goods	0.00	0.00	0.07
Paper and Pulp	0.00	0.14	0.28
Rubber and Plastic	0.00	0.39	0.33
Chemical	0.09	1.45	2.95
Petroleum Products	0.00	0.08	0.16
Metal Products	0.01	0.44	0.60
Steel	0.01	0.20	0.33
Machinery	0.01	0.92	1.89
Electrical Machinery	0.00	1.55	3.66
Automobile	0.03	1.71	4.14
Ship Building	0.04	0.59	1.19
Precision Machinery	0.03	1.58	2.36

Source : Urata & Kawai op. cit.

Table 3 Forward and backward linkages

	Forward Linkage(85)		Backward Linkage(85)	
	Japan	Thailand	Japan	Thailand
Agriculture & Forestry	0.857	1.312	0.921	0.942
Oil & Natural Gas	0.514	0.923	0.800	0.813
Food & Tabacco	0.765	0.935	1.092	1.221
Textile & Leather	0.791	1.141	1.132	1.219
Other Light Industries	1.063	0.875	1.088	1.027
Petrochemical	1.789	1.423	0.953	0.874
Non-Ferrous Metal Products	0.698	0.780	1.068	1.058
Metal Products	1.608	0.894	1.268	1.058
Machinery	0.887	0.787	1.151	0.946
Thansportation Machinery	0.889	0.820	1.318	1.020
Electricity, Gas & Water	0.896	1.046	0.806	1.136
Trade & Transportation	1.507	2.026	0.817	0.901
Service	2.137	1.122	0.790	0.939

Source : Kuroiwa 1991

Table 4 Labor input coefficient :the case of Japan

	1970	1980	1990
Food	0.060	0.076	0.084
Wood & Wood Products	0.118	0.128	0.125
Textile	0.171	0.172	0.182
Leather Goods	0.180	0.198	0.169
Paper & Pulp	0.053	0.056	0.062
Rubber & Plastic	0.102	0.101	0.088
Chemical	0.039	0.038	0.035
Petroleum Products	0.005	0.002	0.005
Metal Products	0.124	0.125	0.128
Non-Ferrous Metal	0.032	0.034	0.041
Steel	0.018	0.022	0.025
Machinery	0.073	0.091	0.079
Electrical Machinery	0.083	0.089	0.072
Automobile	0.061	0.059	0.060
Shipbuilding	0.087	0.089	0.076
Precision Machinery	0.133	0.130	0.118

Source : Urata & Kawai 1995

Table 5 Revealed Comparative Advantage (RCA) in Thailand, Malaysia, Indonesia and Korea

Cases of persistent/significant upward and downward trends

(a) Thailand

[Upward]	1982	1987	1992	[SITC Code]
Fish (fresh, chilled, frozen)	1.24	2.24	2.33	* **
Shell fish (ditto)	10.57	13.35	13.63	** [000s]
Starch, inulin, gluten etc.	0.00	1.98	3.23	*** [500s]
Pottery	0.00	0.00	2.65	[600s]
Heating & cooling equipment	0.00	0.00	1.37	*
Office machines	0.00	0.00	2.04	
Office automatic data processing machine parts & accessories	0.01	0.97	3.34	*
Television recievers	0.00	0.00	5.03	*
Sound recorders & phonograph	0.00	0.00	2.72	*
Telecommunication equipments	0.00	0.10	1.39	*
Electric distributing equipments	0.00	0.96	2.00	*
Trailers, non motor vehicle	0.00	0.00	2.10	*** [700s]
Watches & clocks	0.45	0.67	2.16	**
Toys, sporting goods etc.	0.00	1.26	2.88	
Travel goods, handbags etc.	0.76	1.63	1.70	
under garments knitted	1.23	3.46	3.83	**
Headgear, nontextile clothing	0.85	1.69	2.43	* **
Footwear	1.22	2.76	3.49	* [800s]
[Downward]				
Maize (unmilled)	8.49	5.09	0.25	
Vegetable (fresh & simple preserved)	23.34	15.98	6.50	[000s]
Tobacco (unmanifactured)	5.27	2.82	2.68	
Crude vegetable	1.87	1.48	0.87	** [200s]
Tin	30.07	17.03	3.35	
Woven manmade fabric	3.34	3.17	2.01	[600s]

(b) Malaysia

[Upward]	1982	1987	1992	[SITC Code]	
Live animals for food	0.00	1.53	1.88		[000s]
Alcohols, phenols etc.	0.00	1.14	2.10	* * *	[500s]
Materials of rubber	0.00	2.49	3.38	* * *	
Veneers, plywoods etc.	4.99	6.52	6.71		
Wood manufactures	0.00	1.27	1.53		[600s]
Heating & cooling equipment	0.00	1.24	1.80	*	
Office automatic data processing machine parts & accessories	0.00	0.09	3.15	*	
Television receivers	0.00	2.67	5.09	*	
Radio broadcast receivers	1.21	6.73	10.79		
Sound recorders, phonograph	0.00	0.48	5.33	*	
Telecommunication equipments parts & accessories	0.50	0.92	2.33	*	
Switchgear etc. parts	0.25	0.64	1.33		
Ships & boats	0.03	1.39	1.66		
Electric distribution equipment	0.00	0.24	1.13	*	[700s]
Photo apparatus, equipment etc.	0.00	0.68	2.56		
Gold & silver ware, jewery etc.	0.00	0.85	3.24		
Outer wear, knit, nonelastic	0.00	1.12	1.23	* * *	
Headgear nontextile clothing	0.00	2.06	4.98	* * *	[800s]
[Downward]					
Fish (prepared, preserved)	2.53	2.38	0.00		[000s]

(c) Indonesia

[Upward]	1982	1987	1992	[SITC Code]	
Fish (fresh, chilled, frozen)	0.00	0.69	1.91	* * *	
Cocoa	0.63	2.20	3.10		[000s]
Base metal ores, conc.	1.74	4.46	7.81		[200s]
Fertilizers	0.10	1.41	1.44		[500s]
Wood manufactures	0.00	0.81	3.94	*	
Cotton fabrics woven	0.08	1.96	2.67	* *	
Glassware	0.00	0.00	1.58		
Woven manmade fabrics	0.17	1.62	5.69	*	
Lace, ribbons, tulle etc.	0.00	1.87	12.80		
Textile articles	0.00	0.41	2.07	* *	
Base metal household equipment	0.00	0.00	1.37		[600s]
Radio broadcast receivers	0.00	0.00	1.17	*	
Furniture & parts	0.00	0.22	1.64		
Mens outwear not knit	0.31	1.32	3.62	* * *	
Womens outwear nonknit	0.26	1.85	2.94	* * *	
Under garment not knit	1.17	2.31	2.92	* * *	
Outer wear knit nonslestic	0.00	0.83	2.20	* * *	
Textile clothing accessories	0.00	0.00	1.22	* *	
Headgear nontextile clothing	0.00	0.00	1.38	* * *	
Footwear	0.00	0.19	4.54	*	[800s]
[Downward]					
nil					

(d) Korea

[UPward]	1982	1987	1992	[SITC Code]	
Petroleum products, refinery	0.00	1.43	5.24		[300s]
Alcohols, phenols etc.	0.00	0.41	1.97	* * *	
Polymerlization products etc.	0.27	0.57	1.25		
Starch, inulin, gluten etc.	0.61	0.53	1.51	* * *	[500s]
Knitted fabrics etc.	0.00	1.38	4.66		
Special textile fabrics products	1.72	1.96	3.12		
Meterial of rubber	0.00	0.61	3.74	* * *	[600s]
Transistors, valves etc.	2.72	3.42	4.88		
Trailers, non motor vehicle	6.09	7.31	7.51	* * *	[700s]
[Downward]					
Fish (fresh, chilled, frozen)	5.29	4.10	2.00	* *	
Shell fish (ditto)	2.95	2.96	1.37	* *	[000s]
Crude vegetable materials	1.14	0.93	0.00	* * *	[200s]
Explosives. pyrotech products	2.06	1.00	0.00		[500s]
Lime, cement, building products	5.39	3.11	1.80		
Cotton fabrics woven	1.83	1.41	1.10	* *	
Structures & parts	2.90	2.78	2.16		
Textile articles	3.40	3.02	1.68	* *	
Wire products (nonelectric)	4.39	3.76	2.92		[600s]
Watches & clocks	1.49	1.42	0.58	* *	
Mens outwear not knit	5.05	3.78	1.57	* *	
Wemen outwear nonknit	13.60	8.56	2.76	* *	
Under garment not knit	5.82	5.32	2.23	* *	
Outer wear nonelastic	5.82	5.32	2.23	* *	
Under garments knitted	5.93	5.27	1.83	* *	
Textile clothing accessories	6.90	5.73	4.84	* *	
Headgear, nontextile clothing	12.84	11.98	7.59	* *	[800s]

Source : The Japan Economic Research Institute

Note : * Same trends are shared among ASEAN countries

** Upward trend in ASEAN and downward trend in Korea

*** Same trends are shared amongASEAN and Korea

Table 6 Traditional export goods in Thailand, Malaysia, and Indonesia

Commodities with double digit RCA in 1982

	Thailand	Malaysia	Indonesia	[SITC Code]
Shell fish, frozen	10.57			
Fish etc., prepared, preserved	12.72			
Rice	54.31			
Vegetable etc., fresh, simply preserved	23.34			
Fixed vegetable oil nonsoft		51.87		
Sugar and honey	10.15			[000s]
Natural rubber, gums	24.70	39.34	11.34	
Other wood rough, squared		36.59		[200s]
Tin	30.07	32.27	10.05	[600s]
Electrical machinery		10.29		[700s]

Source : The Japan Economic Research Institute

Table 7 First phase sunrise commodities: commodities with remarkable increase

	Thailand	Malaysia	Indonesia	[SITC Code]
Live animals for food		0.00—1.53		
Meat, fresh, chilled, frozen	0.77—2.02			
Shell fish, chilled, frozen			2.56—6.58	
Fish etc. prepared, preserved	12.72—28.17			
Vegetables, fresh, simply preserved			0.17—1.31	
Coffee and substitutes			2.16—6.60	
Cocoa		3.72—10.80	0.63—2.20	
Tea and mate			4.35—11.22	
Spices			4.91—23.10	[000s]
Tobacco unmanufactured			0.00—2.20	[100s]
Materials for rubber		0.00—2.49		
Woods shaped, sleepers			1.70—4.34	
Natural rubber and gums			11.34—32.64	
Base metal ores, conc.			1.74—4.46	
Crude vegetable materials			0.00—3.06	[200s]
Petroleum products			0.53—2.00	
Residual petroleum products			0.00—12.32	
Gas, natural and manufactured		0.00—5.00	6.14—17.30	[300s]
Fixed vegetable oil nonsoft			2.14—15.41	
Processed animal vegetable oil			1.80—4.93	
Processed animal vegetable oil		6.42—23.88		[400s]
Alcohols, phenols etc.		0.00—1.14		
Fertilizer			0.10—1.41	
Starch, inulin, gluten etc.	0.00—1.98			[500s]
Veneers, plywood	0.00—1.47		5.47—43.09	
Woods manufactures		0.00—1.27		
Lime, cement, building products			0.00—1.82	
Pig iron		0.00—1.76		
Iron, steel tubes, pipes			0.00—1.38	
Iron, steel tubes, pipes	0.25—1.38			
Aluminium			0.13—1.81	
Leather	0.54—1.79			
Leathers etc. manufactures	0.74—9.48			
Special textile fabric products	0.00—1.17			
Woven man-made fib. fabrics			0.17—1.62	
Lace, ribbons, tulle			0.00—1.87	
Cotton fabrics woven			0.08—1.96	[600s]
Household type equipment	0.00—8.93			
Heating, cooling equipment		0.00—1.24		
Television receivers		0.00—2.67		
Radio broadcast receivers		1.27—6.73		
Electric power machinery		0.65—2.73		
Transistors, valves	0.00—3.41			
Ships and boats		0.03—1.39		
Electrical machinery	0.12—2.28			[700s]
Toys, sporting goods	0.00—1.26			
Gold, silver ware, jewery	0.98—8.06			
Furniture, parts thereof	0.76—1.63			
Travel goods, handbags	1.94—3.97			
Mens outwear not knit	1.81—4.63		0.31—1.32	
Womens outerwear nonknit			0.26—1.85	
Outer wear knit nonelastic	1.51—3.60	0.00—1.12		
Under garments knitted	1.23—3.46		0.00~2.05	
Headgear, nontextile clothing		0.00—2.06		
Footwear	1.22—2.76			[800s]

Source : The Japan Economic Research Institute

Table 8 Second phase sunrise commodities: commodities with remarkable increase

	Thailand	Malaysia	Indonesia	[SITC Code]
Fish, fresh, chilled, frozen			0.69—1.91	[000s]
Coal, lignite and peat			0.34—3.72	
Crude petroleum			0.62—3.50	[300s]
Woods manufactures			0.81—3.94	
Textile yarn and thread			0.61—1.50	
Pottery	0.00—2.65			
Glassware			0.00—1.58	
Woven manmade fib fablic			1.62—5.69	
Lace, ribbons, tulle			1.87—12.80	
Textile articles			0.41—2.07	
Base metal household equipment			0.00—1.37	[600s]
Heating, cooling equipment	0.00—1.37			
Office machines	0.00—2.04			
Office adp machine parts	0.97—3.43	0.09—3.15		
Television receivers	0.00—5.03	2.67—5.09		
Radio broadcast receivers			0.00—1.17	
Sound recorders, phonograph	0.00—2.72	0.48—5.33		
Telecom equipments, parts etc.	0.10—1.39	0.92—2.33		
Electric distributing equipments	0.96—2.00			
Trailors, non motor vehicles	0.00—2.10			[700s]
Photo apparatus, equipments		0.68—2.56		
Watches and clocks	0.67—2.16			
Gold, silverware, jewery		0.85—3.24		
Toys, sporting goods	1.26—2.88			
Furniture, parts thereof		0.27—1.10	0.22—1.64	
Mens outwear not knit			1.32—3.63	
Outer wear not knit			0.83—2.20	
Textile clothing accessaries			0.00~1.22	
Headgear, nontextile clothing		2.06—4.98	0.00—1.38	
Footwear			0.19—4.54	[800s]

Source : The Japan Economic Research Institute

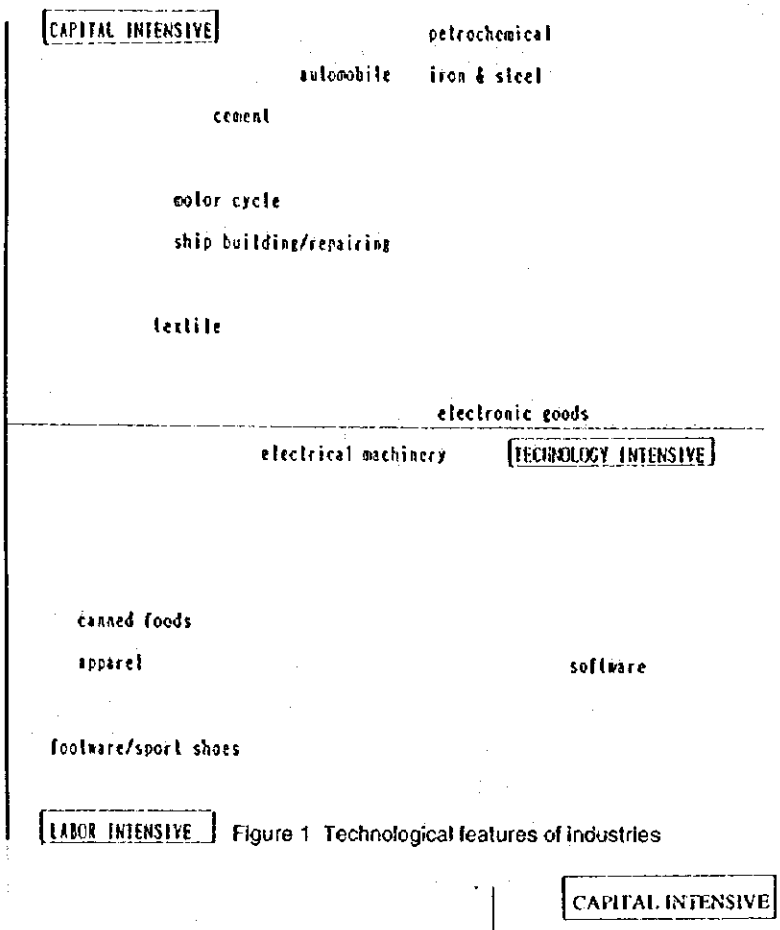


Figure 1 Technological features of industries

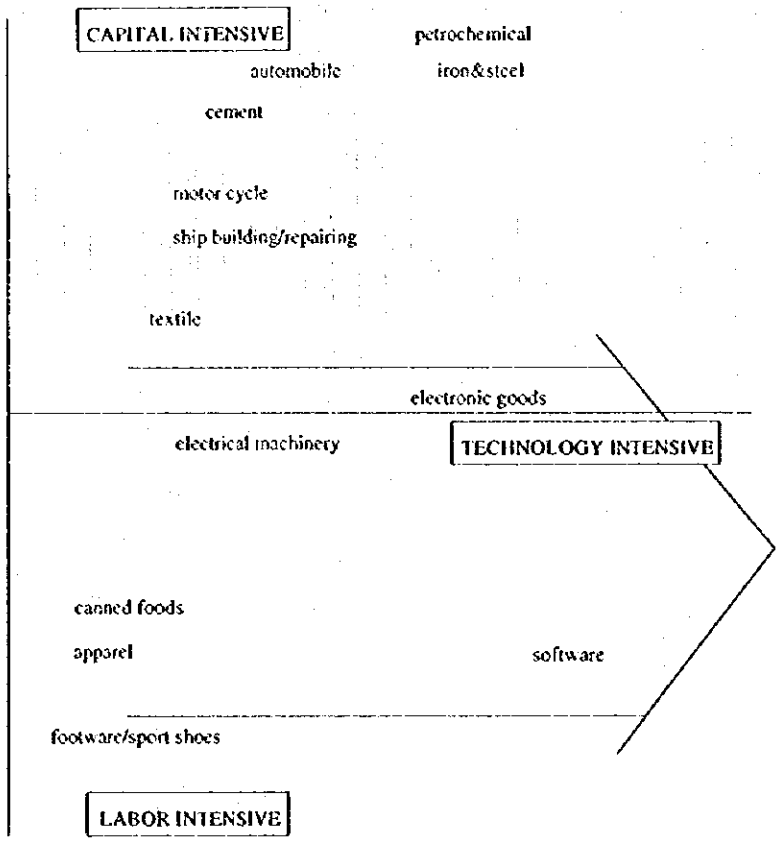
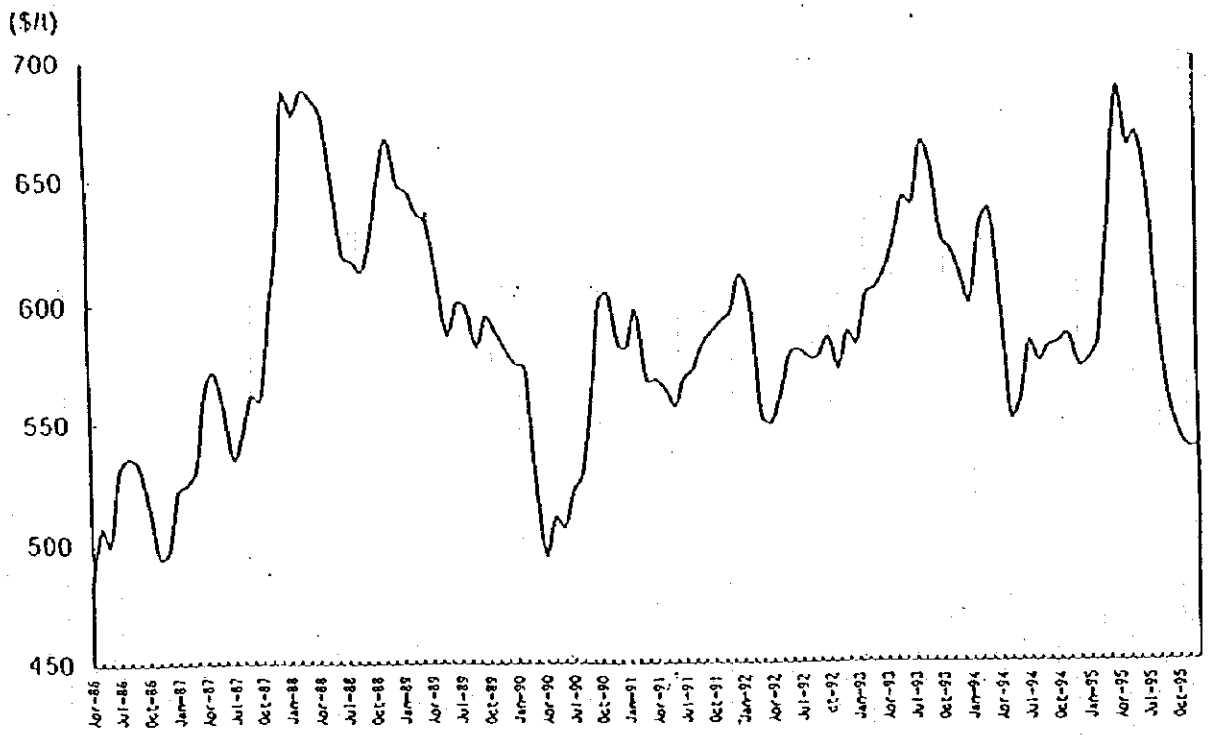
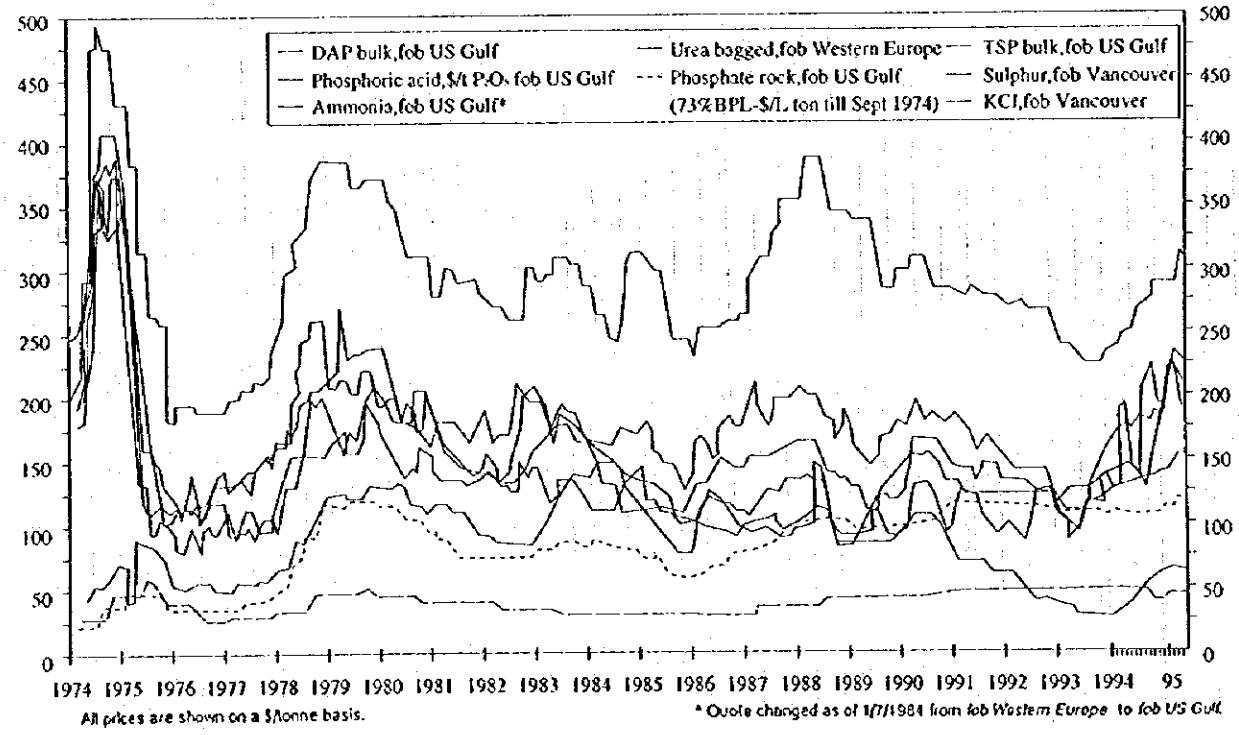


Figure 2 Feasible path of industrialization in Viet Nam



Source : The Japan Economic Research Institute

Figure 3 Steel price trends



Source : Fertilizer International

Figure 4 Historical price trends

4
Five Capital Intensive Industries and Possible Problems for New Investment

Koichiro Fukui
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In the preceding section, we have presented the theoretical framework of choosing and nurturing promising industries and identified promising industries in Viet Nam. Its preliminary view suggests that the most promising path of dynamic comparative advantage for the Vietnamese industries would be to shift from labor intensive industries of low technology toward labor intensive industries of high technology. This view is based on the preceding experiences of some East Aisan countries, opinions of potential investors, and Vietnamese advantage in human resources.

On the other hand, capital intensive industries have also played an important role in industrialization historically in some countries. This section examines the nature and the trend of the international market of some heavy and chemical industries, in which the Vietnamese government has strong interest. They include iron & steel, petroleum refining, petrochemical, urea fertilizer and cement. These industries, especially the former three, require huge amount of investment with long pay-back period and small difference of production cost per unit could divide the winner and the loser. They are international commodities and the price of products fluctuates according to the global economic situation, and supply & demand. For these reasons, the timing of investment, the trend of international supply & demand, and the feasibility of each project must be carefully examined, even though the country with sizable population like Viet Nam will eventually need all these indutries domestically.

One common aspect of these five industries is that natutal resources necessasry for these industries exist in Viet Nam and there may exist a natural tendency to take advantage of this fact by adding more values to these materials. However, like in iron & steel industry, the experiences in Japan and Korea have proven that the existence of raw materials does not necessarily give an advantage in international conpetitiveness. Raw materials can be sold as they are, although too much attention to them could bring another danger of so-called 'Dutch disease'. Viet Nam's real strength lies in human resources and industrial policy should encourage this advantage.

I. Iron and steel

Although it is forecast that aggressive capacity increasing programs will be implemented in Korea, Taiwan and other Asian countries, a shortage of steel in the ASEAN region will continue even after the year 2000 because of the active growth in demand for steel for the construction of infrastructures, etc.

The distinctive feature of the steel industry in ASEAN countries is that existing equipment consists of electric furnaces and rolling mills for domestic demand. Construction and expansion of middle-scale electric furnace steel production plants (up to about 1 million tons) and rolling facilities are also the main focus of investment programs for the future. It is forecast that the development of blast furnace steel production will

stay in a limited range even in the future because a) scale of investment is large, b) domestic demand (especially steel plate demand for automobiles and home electric appliances) is still small and feasibility is low in each country, c) infrastructure such as harbors for unloading and shipment are not sufficient yet, and d) there is a shortage of skilled technicians.

In the case of Viet Nam, there is the possibility that an integrated steel plant based on the direct reduction (DR) method or blast furnace method will be feasible in the future since raw material resources such as iron ore, coal, etc. are domestically available. However, it has been proven from experience in Japan and Korea that the existence of raw material resources does not necessarily give an advantage in international competitiveness in the steel industry and that it is effective to try to reduce costs by importing large quantities of the most suitable iron ore by ships exclusively used for that purpose and manufacturing steel products in a seaside plant in large quantities. It is possible, therefore, that the construction of an integrated steel plant with the concept of using an existing mine would tend to be a captive mine, lack flexibility, and fail due to high costs.

It seems that the investors' side is also cautious about the construction of large-scale integrated steel plants in ASEAN countries at present due to large risks and problems related to the lack of infrastructure, shortage of technicians, etc. Considering expected capacity increases in Korea and Taiwan, excess capacity of steel production will also bring unsuitability to the international price of steel products. In fact, in other ASEAN countries, integrated steel production has begun in relatively small-scale DR method plants. In some cases, plants have become burdens due to high costs. In country M, for example, a Direct Reduced Iron (DRI) plant, which commenced operation a few years ago with the capacity of 1.2 million tons per year, is running a huge deficit due to the abnormally high cost of initial investment. Truck transportation costs are also huge due to the great distances separating the steel making and rolling facilities. The burden of the government caused by the plant is snowballing yearly. On the other hand, in country I, a DRI plant has been successfully operated and capacity expansion has been planned. In both countries the demand for steel has been growing rapidly, reflecting the high economic growth, but the profitabilities of the two projects differ largely. This shows that, even in the case of constructing relatively small-scale integrated steel plants, careful examination in feasibility is necessary.

In the beginning of the 21st century, when steel demand in Viet Nam is expected to have grown to a massive scale, there will be a possibility of constructing a 3 million ton class, integrated steel plant. However, it would be necessary, at that time, that a) it be an internationally competitive project (Desirably, the location of the plant should be at a seaside site suitable for a massive plant complex that can take advantage of the economy of scale.) and b) a considerably large amount of the products be consumed in the domestic market. If the former is not so, the portion which corresponds to the high cost must be covered and, therefore, the burden would have to be borne by public finance or consumers. If the latter is not fulfilled, the degree of exposure to the risk of international market conditions would be heightened and the business risk could not help but be heightened.

1. Steel demand forecast in Asia

The trend of steel product consumption (apparent consumption amount of crude steel) in the world (1972 ~ 2000) shows that it has progressed firmly and has accumulated 700 million tons up to present, although there were ups and downs depending on the economy. In the future, the International Iron and Steel Institute (IISI) predicts that the demand will grow steadily to 770 million tons in 1995 and 800 million tons in 2000 with China and ASEAN countries being the force behind the expansion of the Asian economy (Fig. 1, Table 1).

Under such circumstances, it is forecast that an excess demand will continue in Asian countries as a whole, although each country, not to mention Korea and China, will aggressively push forward capacity increase programs in compliance with flourishing domestic demand. The balance of steel trade for 1993 showed an excess of crude steel imports of 58 million tons. This number was especially influenced by

Degree of economic development of Asian countries

GDP Per Capita (US$)		
Less than 1,000	1993	China, Indonesia, Philippines, Viet Nam
	2000	China, Indonesia, Philippines, Viet Nam
	2005	China, India, Viet Nam
1,000 ~ 5,000	1993	Thailand, Malaysia
	2000	Thailand
	2005	Indonesia, Philippines
5,000 ~ 10,000	1993	Korea, Taiwan
	000	Malaysia
	2005	Thailand, Malaysia
More than 10,000	1993	Korea, Taiwan
	2000	Singapore, Korea, Taiwan
	2005	Singapore, Korea, Taiwan

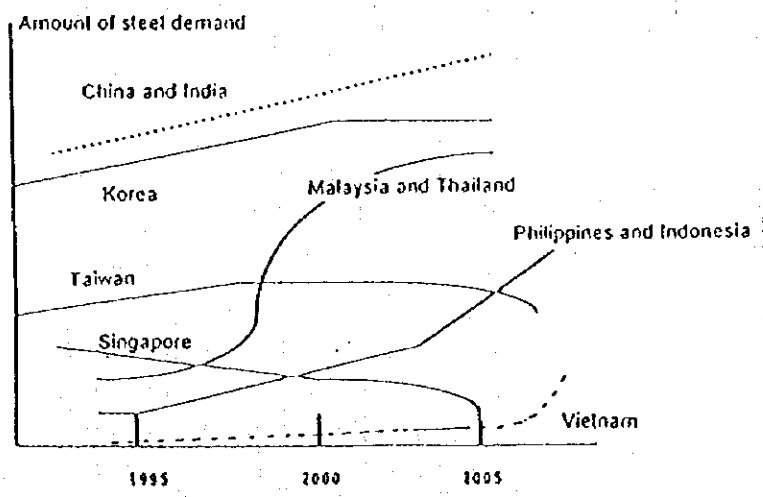
China's excessive imports. The extent of excessive imports is also increasing in ASEAN countries such as Thailand, Malaysia, etc., due to the rise in their income levels (Table 2).

Steel product demand in ASEAN countries (Thailand, Malaysia, Indonesia, Singapore and the Philippines) has expanded from the level of 10 million tons in the early 1980s to close to 25 million tons in 1993. Supply cannot catch up with demand and the self-sufficiency rate in steel (steel consumption amount/steel production amount) is lower than 50% excluding the Philippines and Indonesia. ASEAN countries as a whole are importing more steel products than they are producing.

The correlation coefficient between steel demand and GDP per capita is extremely high and the growth of steel product demand increases the most in the range where GDP per capita is $1,000 to $5,000. It is forecast that the steel product demand in ASEAN countries will expand to more than 40 million tons by around the year 2000 since Thailand and Malaysia will reach this level around 2000 and Indonesia and the Philippines will join them around 2005.

(1) Relationship between economic development and steel demand

Steel demand increases in proportion to income per capita. However, when income reaches a certain level, the growth either stops or declines. Steel product consumption per capita can be estimated roughly from GDP per capita and the domestic steel product demand of a nation can be calculated by multiplying this by the population.



Steel demand transition in Asian regions (Image)

1) In the Case of Countries with the Population of Normal Size (Based on 1990)

Less than $1,000 GDP per capital

	Steel product demand expands but growth is slightly low.
$1,000 ~$ 5,000	The period when demand growth is the highest.
$5,000 ~ $10,000	Demand increases but the growth rate slows down.
More than $10,000	Demand levels off or decreases.

2) Regional Differences, Countries with Massive Populations (China, India)

If income grows in a specific region and does not grow in other regions, the growth pattern is a gently climbing curve, not a normal S curve, because the growth curves do not move in parallel and thus overlap each other.

2. Trend of capital investment

When we look at the existing facilities in ASEAN countries, they are mainly downstream rolling facilities. However, in addition to the existence of steel plants with electric furnaces, there are some charcoal blast furnaces in Thailand and Malaysia and integrated steel plants based on the DR method in Indonesia and Malaysia. The economic efficiency is not generally high since the charcoal blast furnaces depend on wood resources and the price of natural gas, fuel in the DR method, has increased, although the profitability differs by large extent by plant.

The main production item is bar steel for use in construction and engineering. These areas depend on imports for steel plates. However, countries such as Indonesia, Thailand, the Philippines, etc. have already been producing steel plates for the manufacturing of hot rolled, cold rolled and steel plate processed products (such as tin plates).

To cope with demand expansion, aggressive construction and the expansion of facilities are planned in each ASEAN country (Table 3). In addition to strengthening the steel making process by construction and expansion of DRI plants and electric furnaces, the reinforcement of large scale rolling processes such as hot and cold rolling mills are being planned. This reflects the increase in demand for steel plates used in home electric appliances, automobiles and construction materials.

In Korea plans have been made for large-size capital investments centered around a POSCO blast furnace and a Kanpo electric furnace. It is forecast that their reserve strength for export will increase further. In Taiwan, an increase in blast furnace capacity by CSC and others is planned. This will help cope with strong domestic demand and improve and expand public capital. At present, Taiwan is a steel products importer; however, it is highly possible that it will become a steel products exporter after the year 2000 because the demand for domestic construction will slow when there is an increase in production capacity. In China, it is forecast that the demand for steel products will enter into an adjustment phase in 1995 and 1996 due to the influence of an inflation control policy, but an increase in steel product demand has been projected because there will be improvement of the fundamental infrastructure, and production increases in automobiles, home electric appliances, etc., corresponding with higher income levels. Large size investments by Paoshang, Wuhang, and Capital Steel are being planned.

3. Investors' view

The steel industry is a typical capital-intensive industry and a colossal sum of investment is necessary for an integrated steel plant. Even for an electric furnace steel making and rolling mill, investment of more than US$ 500 million is required, if it is a thin slab rolling-type mill with new technology. Steel as well as petrochemicals is highly important as basic raw materials industry. However, it requires a long period to recover the invested funds. Stability and transparency of middle-and long-range policy based of the comprehensive master plan is necessary at the time of appropriation of a limited development fund for the steel industry. Also, it is important to secure human resources to engage in the operation and maintenance

of facilities, especially in upstream processes where technology has become highly advanced.

In regard to slab rolling, the steel plate production process is short; therefore, cost competitiveness is high. However, the problems such as not being applicable to high grade steel plates, such as deep drawing plates for automobiles have been pointed out.

The DR (direct reduction steel) process utilizing natural gas has been adopted in Malaysia, Indonesia. However, problems have been pointed out in some cases in using the technology in other places on a commercial, because of a) the quality of natural gas, b) the price of natural gas, c) restrictions on location due to the problem of natural gas transportation, etc.

II. Petroleum refining

The petroleum products demand in the East Asian region is expected to show high growth in the future due to the rise in economic activities and in income levels. In regard to petroleum refining capacity on the other hand, many countries are planning aggressive expansion coping with the demand increase in gasoline, gas oil, etc. However, progress in the construction of new joint-venture refineries with foreign oil companies, has been delayed in China, Indonesia and other countries, because the foreign enterprise sides are considering the feasibility cautiously.

With respect to crude oil, it is forecast that dependency on the Middle East will heighten in the East Asian region in the future. In petroleum refining, the movement toward building refineries in the consuming areas rather than near raw material sources is expected to be strengthened. This is because, when the export-oriented petroleum refining business is carried out near the raw material production area, profit feasibility is low not only in Viet Nam but in all the countries since a) the new refinery cannot compete with the refining costs of Singapore, which is the export base in the region, b) the consumption pattern of petroleum products and the ways of coping with quality standards, etc. are different in each market, and c) there are problems related to the marketability of by-products.

The demand for petroleum products in Viet Nam was 66,000 B/D in 1993 and is expected to reach to about 120,000 B/D in the year 2000 (forecast by the Petroleum Association of Japan). Domestic demand may be still small to develop a full-scale refinery (minimum 100,000 B/D), although the viability of the plant partly depends on the future production of Vietnamese crude oil. Furthermore, Viet Nam is planning a petroleum refining business under joint venture with foreign capital and it is extremely important, in such a case, to maintain profitability. There are many tasks which the Viet Nam side must clear up in the future including administrative organization. Otherwise, the introduction of Foreign Direct Investment (FDI) will be difficult. There are cases in other countries where joint-venture projects do not proceed due to conflicts of interests between investors and host countries. In country C, for example, prospective foreign capital providers insisted on minimizing the number of employees to increase productivity. On the other hand, the host country demanded massive increases in employment from the viewpoint of job creation. As a result, the project has not proceeded.

Foreign investors also consider the viability of petroleum refining to be under various constraints.

1. Demand forecast for petroleum products in Asia

It is forecast that the growth of petroleum products demand in Asia, which is higher than other regions in the world, will continue, reflecting active economic activity. In Asia, nine countries in the East Asian region which are members of the NIEs and ASEAN (Korea, Taiwan, Singapore, Hong Kong, Indonesia, the Philippines, Thailand, Malaysia and Viet Nam) are either in the middle of full-fledged motorization or in the process of becoming motorized due to their economic growth and increase in income. Therefore, a steady increase in demand for light oil grades such as gasoline, gas oil, etc. is predicted. Also, growth of gasoline demand is expected in Viet Nam.

As forecast by the Petroleum Association of Japan, the demand for petroleum products in the East Asian region will increase from 4,754,000 B/D in 1993 to 6,836,000 B/D in 2000 with an average annual growth of 5.3%. The individual growth rates for gasoline (average annual growth of 6.6%) and middle distillates (average annual growth of 7.1%) are forecast to go up (Table 4).

Refining capacity has usually been in the state of shortage for the past ten years all over the Asian region (except the Middle East and Japan) However, in East Asia, the state of shortage has been gradually improved. This is the result of capacity increases in Korea, Singapore, Taiwan, etc . A refining capacity in this region is expected to be relatively in surplus toward the year 2000, although there exist some uncertainties (Table 5). With regard to China, it carries the most weight in supply and demand in the Asian region. China is also anticipated to have the highest growth rate next to South Asia (India, Pakistan and Sri Lanka) , but it is in a state of chronic shortage of refining capacity due to the delay in petroleum refinery construction.

2. Trend of capital investment

Up until now refineries have been constructed and expanded in each country to address the active expansion of petroleum products demand. Future expansion of refining capacity such as the construction of many new refineries is also being planned in each country. However, although the extent of construction and refinery expansion through 1997 has almost been decided, it is necessary to realize that there are uncertain aspects, particularly in China, as shown in the case of Aramco where progress has become unpredictable due to the rupture in negotiations with the State Planning Committee.

The general view of tendencies in East Asian countries is as follows.

Korea: Facility expansion is progressing taking into consideration deregulation and liberalization of the petroleum industry, which are expected to be enforced in January 1997. Capacity expansion of approximately 800,000 B/D by five petroleum refining companies by 1997 has been planned and 50% of the products produced from surplus capacity are expected to be exported to overseas markets (China and Viet Nam).

Taiwan: Capacity expansion of two petroleum refineries and re-enforcement of the secondary facilities are being planned under the initiative of CPC.

Singapore: It is the biggest export base for petroleum products in Asia and the base of major oil companies. It will continue in the future to assume the role of swing refinery (the refining base to for supplying products to countries lacking sufficient capacity).

Indonesia: Although EXOR-1 which started operation in 1994 was originally planned to export 80% of its products, the export volume is forecast to decrease greatly due to the expansion of domestic demand, etc. The national plan other than EXOR-1 is still under uncertainty

Malaysia: Malacca Refinery started operation in 1994. The use of natural gas is being promoted in order to secure the export surplus power in crude oil, but demand for petroleum products is increasing, making gasoline and gas oil key products. Capacity expansion such as Malacca No. 2 Refinery is being planned.

Thailand: Growth in domestic demand for petroleum products is high due to the development of the economy. ESSO, Shell and Caltex are planning the construction and expansion of refineries for the domestic market.

3. Investors' view

Petroleum refining is a capital-intensive business and added value is low (Fig. 2) . Therefore, in the beginning, the business is not profitable unless it is protected. For major oil companies such as Shell and BP, profitability is maintained by continuous involvement in every stage, from the production of crude oil to the sale of petroleum products and by developing their business globally.

Although construction plans in China and Indonesia for export-oriented petroleum refineries of Middle

East crude oil are intended to position petroleum refining as the industry for obtaining foreign currencies, most are unsuccessful because a) they are not competitive with Singapore and b) petroleum products are co-products and the business is not profitable without strong marketability. Recently oil producing countries such as Kuwait have been strengthening the movement toward aquiring refineries in consuming countries.

In Viet Nam's development of the petroleum refining business, prior conditions must exist for profitability. First, they need to focus on domestic demand. Second, new entry into the market is to be restricted. Third, the location is to be near the consuming area. Fourth, retailing business can be carried on. This final point on retail especially causes anxieties because; a) Petro-Viet Nam, an authority responsible for negociating with foreign capital in the petroleum business, is not controlling domestic sales, and b) it will take time to unify the responsibility of the downstream business which presently is divided among several government agencies. In Thailand and Malaysia, petroreum business is dependant on foreign capital. In Indonesia, on the other hand, the petroleum business is monopolized by a government enterprise (Pertamina). The refining margin is low in Thailand and Malaysia since petroleum product pricing decisions are linked to Singapore prices. Howeve, foreign capital has been approved in retail business. In Indonesia, product prices are decided by the government and an arrangement has been made to subsidize Pertamina when a difference occurs between supply cost and product price.

III. Petrochemical

The petrochemical industry in Asian countries has been achieving rapid development in recent years, riding on the back of healthy increases in demand and government-led measures for protection and growth. ASEAN countries, in particular, have since the second half of the 1980s entered a phase of full-fledged development into upstream petrochemical sectors.

However, care is needed in the timing of entry into upstream petrochemical sectors, for, although they are of very great importance as base material industries, they have industrial characteristics such as; a) large scale investment and, moreover, susceptibility to large changes in international situations, etc., thus large business risks, b) poor feasibility if domestic markets have not grown sufficiently to accommodate products, and c) comparatively little employment absorbency, because they are capital intensive. The experiences of Indonesia, Thailand, and Malaysia (countries endowed with crude oil and natural gas resources) show that these counties have moved into upstream sector of ethylene center, while nurturing petroleum refining projects, thus developing bases for their petrochemical industries, and while waiting for the timing that downstream industries such as plastics processing have moved into a growth phase, thanks for example to the introduction of foreign capital.

Nevertheless, we need to bear in mind that the experience of neighboring ASEAN countries will not in itself be useful for Viet Nam. To begin with, Indonesia, Thailand, and Malaysia, in line with the establishment of the Asia Free Trade Association (AFTA), have gradually started to promote measures to liberalize their petrochemical industries, such as; a) abolishing entry restrictions, b) reducing tariffs, and c) deregulating foreign capital. However, for late-starting Viet Nam, international tolerance of policies for protection of its petrochemical industry is waning. Secondly, plans are in progress for capacity expansion in Singapore and elsewhere in Asia with the intention of expanding market share. Relative superiority in cost competitiveness is anticipated to influence the success or failure of each project more than has been the case hitherto.

In Viet Nam, as in other ASEAN countries, a petrochemical complex would be for import substitution. In this case, feasibility must be examined carefully in terms of conflicts of interest between downstream and upstream activities. In country T, this examination was not enough. As a result, the export ratio of upstream plants had to increase and the managerial risk of the plant increased. In country I, where a petrochemical complex, constructed with 100% foreign capital, commenced operation last year, the ratio of sales to the domestic market was low and the ratio of export, where the profitability is generally low, had to be

increased. As a result, the profitability of the plant has been low.

Therefore, for commercialization, it will be important to fully examine the content and period of internationally tolerable industrial policies for the petrochemical industry, while it will also be necessary to carefully check whether or not it has cost competitiveness that could stand up to international competition.

1. Prospects for petrochemical products in Asia

In conjunction with the outstanding economic growth in Asian countries in recent years, demand for petrochemical products in the Asian region is expanding rapidly. Bearing in mind the constraint of foreign reserve in these countries, it would be difficult to say that the present rapid growth of demand will continue unconditionally. Nevertheless, the volume of plastics used per capita in Asian countries is still at a considerably low level compared to developed countries (Fig. 3), and thus the latent demand in Asia can be considered extremely high.

The demand for petrochemical products in the Asian region (excluding Japan) in 1996 is forecast at 15.1 million tons in ethylene equivalent, thus forming the third largest market after North America (21.22 million tons) and Western Europe (18.2 million tons) (Table 6).

Meanwhile, although production capacity is expected to increase in South Korea, Indonesia, Thailand, Malaysia, and elsewhere, domestic demands probably will not be met other than in Korea and Singapore. Therefore, the balance of supply and demand in Asia as a whole is expected to bring a shortfall of about 4.3 million tons in 1996 (Table 7, Fig. 4).

Looking ahead to the year 2000, the supply and demand balance for petrochemical products in the Asian region is expected to depend as ever on imports from outside the region, since an increase in demand is anticipated in conjunction with the economic growth of the various countries in the region.

2. Trends of capital investments

According to a Ministry of International Trade and Industry (MITI, Japan) forecast, based on official figures from each country, the global production capacity for ethylene (77 million tons in 1994), is expected to increase by 19 million tons to 96 million tons in 2000, thus approaching the 100 million ton mark.

The production capacity increase of 19 million tons is broken down into 7 million tons for the Asian region, 5 million tons for North America, 3 million tons for the Middle East, and 1 million tons for Western Europe. Thus Asia is expected to be the region that will lead the world-wide increase in equipment capacity (Table 8). Within the Asian region, vast increases in capacity are forecast for China (1.8 million tons), where the petrochemical industry is seen as one of the country's priority key industries, India (1.7 million tons), where there is an energetic move towards self-sufficiency, the ASEAN region (1.6 million tons), and elsewhere. On the other hand, in Western Europe the scale of new equipment is shrinking while in North America and the Middle East large increases in capacity are planned.

3. Trends in equipment expansion plans in the Asian region

(1) South Korea

The South Korean government's petrochemical investment guidance plan (that previously restricted investments for equipment expansion) started by deregulating downstream products in October 1994. At the same time, the policy changed to one of recognizing equipment expansion on a case-by-case basis. A decision was made to abolish the said guidance plan on January 1, 1996, so at this stage there is some uncertainty as to what moves South Korean petrochemical manufacturers will make in future.

(2) Taiwan

The CPC's No. 5 Ethylene Cracker Plan (400,000 tons), on which construction was started in April 1990, started operation in April 1994 . At the same time the No. 2 Cracker (230,000 tons, 1973), that had problems associated with pollution and obsolescence, was closed down. As a result, ethylene production capacity in Taiwan at the end of 1994 was 1.02 million tons, though the capacity for priority products was

1.56 million tons (ethylene equivalent). There are prospects for ethylene equipment capacity to be increased to 1.35 million tons by the year 2000.

(3) China

Since 1983, the China Petrochemical Public Corporation (Sinopec), originally a centrally controlled organization, has been progressively regionalized. As a result, regional governments, the chemical industry sector, and the Petroleum and Natural Gas Corporation as well as Sinopec have taken part in new ethylene projects in the first half of the 1990s (1.27 million tons). Sinopec's capacity ratio as of 1997, when the new equipment project will be completed, is expected to be about 80%.

In June this year the Chinese government announced the "Chinese Industrial Policy Guidelines for the 1990s" (industrial policies aiming at the year 2000) in which emphasis is placed on the petrochemical industry as a priority key industry. Ethylene equipment capacity is expected to increase to 1.85 million tons by 2000.

(4) ASEAN

- Thailand:

The NPC2 plan is proceeding more or less as scheduled, for example operation of an ethylene plant started at the end of 1994. New equipment is planned in line with domestic demand.

- Indonesia:

Construction of this country's first ethylene plant (Chandra Asri) is now underway. Expanded equipment plans for the downstream product, polyolefin, are also taking concrete shape. Although numerous industrial development projects have been scheduled, nearly all of them are lagging behind. Several equipment expansion plans in downstream sectors are planned on the strength of thriving demand.

- Malaysia:

In addition to polyvinylcloloride (PVC), polystyrene (PS), and polypropylene (PP), a polyethylene (PE) plant started operation in 1993, followed by an ethylene center in 1994. A system of self-sufficiency is progressively being developed to replace the former total dependence on imported raw materials. The Titan petrochemical complex started operating at the end of 1993 (ethylene, linear low density poly ethylene (LLDPE)/high density poly ethylene (HDPE)). Polyethylene Malaysia is currently constructing a LLDPE facility with completion set for the end of this year.

- Singapore:

At the end of 1994 work was began plans to expand ethylene and propylene equipment in the existing PCS complex (Merbau Island), with operation scheduled for 1997. Along with this, TPC plans to expand to LDPE and PP, and PPSC plans to expand to HDPE, starting operation in 1997. The SCSL is planning a new SM (320,000 tons) and PO (140,000 tons) combined plant, due to start operation in 1997.

(5) India

Since 1991 there has been an energetic movement towards self-sufficiency in the petrochemical industry through new industry and international trade policies, and numerous project proposals have been announced.

Reliance has announced that it will expand its new ethylene plant from the initial 450,000 to 750,000 tons, and is now reconsidering its downstream products. Apart from this, there are many major proposals in anticipation of future increased demand, though there is some uncertainty as to whether or not they can actually be realized (included in forecasts).

4. The market for petrochemical products in Asia

The market for petrochemical products in Asia is characterized as being the most volatile in the world, because (a) markets in individual countries are not so large, and (b) demand far exceeds supply inside the region. Therefore the size of the supply from North America, Western Europe, and other locations outside the region has a big effect on the market situation.

Recent movements indicate that Southeast Asian markets are now plummeting after headlong inflation between 1994 and 1995 (Fig. 5). The market inflation was mainly caused by a reduction in supply volumes

outside the region, resulting from factors such as (a) a tightening of supply and demand in the West due to economic recovery, (b) an accident in a major petrochemical plant in the USA, and (c) a shift to an emphasis on profitability by South Korean manufacturers that had previously been making ultra-cheap exports on a full-operation principle.

As stated above, an insufficient supply of petrochemical products inside the Asian region is expected to continue in the future. Therefore, the supply-demand setup of dependence on imports from outside the Asian region is basically not expected to change. However, Asia continues to be a marginal market toward the future. A gradual ease is expected in the situation whereby major changes are caused by external factors such as supply trends in developed countries, rather than by supply within the Asian region. The background to this lies in the strong possibility that, if the Asian market continues to grow and move towards uniformity, the world's largest-scale market will be born, and this will become the most important market for the world's petrochemical manufacturers. In this context, moves to greater self-sufficiency in petrochemical products in Asia and moves by corporations in developed countries to incorporate the growing Asian market into their business plans are expected to accelerate. And, as a result, given such an increase in supply capacity on the Asian market and increased numbers of companies entering it, the market is expected to be formed with greater emphasis on supply-demand factors inside the region, rather than on external factors from outside the region.

5. Investor prospects

In South Korea, Taiwan, and Singapore, and recently also in ASEAN countries like Thailand, Malaysia, and Indonesia, integtated (from upper fo downstresm) production systems have been set up in the petrochemical industry (Fig. 7). The background for this is that developing countries, in the process of aiming for economic growth, have placed the industrialization of the petrochemical industry central to their national economies, both as a key basic material industry and as a means for getting foreign currency.

In Viet Nam, too, it is felt that cultivating a petrochemical industry is important in the process of industrialization and in improving the added value of petroleum and natural gas. However, moves into ethylene centers and upstream sectors that require large investments will provide little stimulous for employment in the short term. On the contrary, the business risk will be high as the recovery period is protracted, and, particularly in Viet Nam's case, there will be little leeway for absorbing upstream sector products on the domestic market and thus, initially, exports will be indispensable (normally the risks for upstream sector businesses are too high unless the domestic sales ratio is about 80%). For these and other reasons the timing of industry startup needs to be studied carefully.

An environment may be created in a petrochemical industry where future upstream business sectors are nurtured by first enhancing downstream sectors such as plastic processing. It will also be important to promote the introduction of foreign currency into export-oriented processing and assembly industries such as the household electric appliance and automobile industries, that consume processed plastic materials in large volumes while simultaneously supporting the growth of local industries for general goods and building.

The growth pattern of the petrochemical industry in ASEAN countries has great significance for Viet Nam, as stated above, but these early starters have protected domestic companies through customs tariffs. The policy objective has been to cultivate the petrochemical industry in this way (the exception to this is Singapore with its principle of total market liberalization). However, in the wake AFTA in 1993, there are increasing moves towards liberalization, including reduced tariff rates, and the ASEAN market has thus started moving towards unification.

Meanwhile, if an all-integrated plant is to be constructed, it will be extremely important to have a clear project concept of either export orientation or import substitution when carrying out feasibility studies. In the case of import substitution, it will be particularly necessary to make full feasibility studies when downstream sector interests conflict with upstream sector interests. If such prior studies are not carried out

adequately and the weight of products, destined for the domestic market but sold in export markets, increases after the plant has started operation, it will not only be vulnerable to fluctuations in the international market, but the export portion will definitely be below the expected profits and the business management risk will increase greatly.

In view of the nature of the business, the petrochemical industry (whether it takes a domestic market dependent or export-oriented form) is inevitably susceptible to the risk of fluctuations in the international market situation. Even in the case of Japanese or South Korean petrochemical manufacturers, corporate earnings have been considerably affected by international market situations. In the case of multinational conglomerates, such risks are alleviated by spreading operations from upstream to downstream sectors in a balanced manner and are hedged by the global dispersal of operations in various regions. But petrochemical companies of small corporate scale and limited resilience experience major fluctuations in their business performance every time the market situation changes. Therefore, for a late-starting company to keep the effects of such international market fluctuations to a minimum, it is important that it enters the industry after developing sufficient absorbency in the domestic market.

IV. Urea fertilizer

World demand for urea fertilizer increased an average of 5% a year for 20 years from the early 1970s to the end of the 1980s. Aggressive efforts to expand supply capacity resulted in excess capacity in the early 1980s, which has continued up to the present time (See Figure 8 and Figure 9). Since 1990, the use of fertilizers has continued to decline because of chaos accompanying the systemic reform in Eastern Europe and the former Soviet Union. Supply capacity is now declining because developing countries were reluctant to invest in fertilizer plant in late 1980s and fertilizer factories in the former Soviet Union were shut down in recent years. According to a supply and demand forecast in July 1994, prepared by the World Bank/FAO/UNIDO and the fertilizer industry, worldwide demand for urea fertilizer is expected to recover slowly at a rate of 1.4% per year for the five year period from 1993/94 to 1998/99, while growth in supply capacity will be slower at 1.2% annually (See Table 9). The excess capacity of the former Soviet Union countries is estimated at approximately 8 million tons for 1995, which is more than 10% of the total world supply capacity of 75 million tons. The movement of FSU countries can create rapid changes in the world supply and demand balance for urea fertilizer, and it is foreseen that wide fluctuations will disrupt the international market for coming years.

Production costs of urea fertilizer are largely determined by three critical variables: [1] cost of raw materials, [2] plant construction costs, and [3] operating rate. Naphtha and natural gas are the main materials used to synthesize ammonia, and they acccount for most of the variable costs. The important factors influencing sales are domestic agricultural policy and international market conditions. Urea fertilizer is a classic international market commodity whose trade price reflects the world supply and demand balance and fluctuations in the prices of its main materials: naphtha and natural gas.

During the 1980s, the worldwide excess capacity accompanied by a rapid fall in the price of naphtha caused a slump in the international market for urea fertilizer, with annual market fluctuating by about US$60.-/ton in a year. (See Figure 10) Fertilizer plants which did not have a production cost advantage over those in nearby countries were forced to operate at a loss, every time the international market slumped. A urea fertilizer plant (production capacity of about 500,000 tons/year of urea fertilizer) started up in country M in the mid 1980s. Production costs of urea fertilizer are were estimated to be US$180/ton for this plant. It appears that this plant loses about $40 million per year if it is forced to ship its product at a price of US$100/ton. In the late 1980s, a plan was prepared for the construction of a government operated urea fertilizer plant in country T (to produce about 670,000 tons/year of urea fertilizer), but the country's National Fertilizer Corporation, which was the body in charge of the project, doubted the feasibility study performed by an international aid organization and asked a university professor , who was neutral regarding the project,

for a reassessment. This aroused public concern with the planned project, which was eventually cancelled. Country B completed three urea fertilizer plants that use domestically produced natural gas as their raw material (each with production capacity of about 500,000 tons/year of urea fertilizer) in the late 1980s. These three plants, whose production costs are estimated at US$ 115/ton appear to have suffered a loss of more than $20 million per year when forced to ship their product at, for example, US$100/ton.

The construction of a capital-intensive urea fertilizer plant is possible only by the injection of a large amount of foreign capital. It is essential to consider not only agricultural policies and the use of natural gas, but to also forecast future international supply and demand and make sure that the plant will be cost-competitive enough to survive fluctuations in the international market.

1. Cost structure of urea fertilizer plants

This report summarizes the urea fertilizer industry as it applies to the construction of a urea fertilizer plant now under study in Viet Nam. When it starts up by 2000, it will produce about 500,000 tons/year of urea fertilizer, the equivalent of 330,000 tons/year of ammonia from associated gas from the Bakuho oil field. A study of the earnings structure of a urea fertilizer plant shows that production costs are determined by three basic variables: [1] cost of raw materials, [2] plant construction costs, and [3] operating rate. Naphtha and natural gas are direct raw materials used to synthesize ammonia, and account for most of the variable costs. Depending on market conditions, it is possible to procure these raw materials from the international marketplace, but it is important to guarantee a stable long-term supply that corresponds to the plant's depreciation period. Cost stability can be attained by finding domestic sources of raw materials, constructing a plant of suitable size equipped with technology that provides good input efficiency, and by maintaining a high operating rate. The important factors influencing sales are domestic agricultural policy in the country where the plant is constructed and international market conditions. In developing countries, fertilizer has significance for problems of starvation, poverty, and food security. Its price, subsidies, and distribution mechanisms are strongly influenced by the agricultural policies of each country. At the same time, urea fertilizer is a classic international market commodity whose trade price reflects the world supply and demand balance and fluctuations in the prices of its principal raw materials: naphtha and natural gas.

2. Outlook for world supply and demand for urea fertilizer

(1) World supply and demand and price fluctuation for urea fertilizer

World demand for urea fertilizer increased an average of 5% a year for 20 years from 32 million tons in the early 1970s to 80 million tons at the end of the 1980s. During this period, aggressive efforts to expand supply capacity resulted in the excess capacity in the early 1980s, which has continued up to the present time.

Since 1990, the use of fertilizers has continually declined because of chaos accompanying systemic reform in Eastern Europe and the former Soviet Union. Supply capacity is now declining because the developing countries were reluctant to invest in fertilizer plant in the late 1980s and fertilizer factories in the former Soviet Union were shut down in recent years.

(2) Outlook for world supply and demand for urea fertilizer

According to a supply and demand forecast prepared as a joint project by the World Bank/FAO/UNIDO and the fertilizer industry, and announced in July 1994, worldwide demand for urea fertilizer is expected to recover slowly at a rate of 1.4% per year for the five year period from 1993/94 to 1998/99, while growth in supply capacity will be slower at 1.2% annually. (See Table 9).

The excess capacity of the former Soviet Union countries is estimated at approximately 8 million tons for 1995, which is more than 10% of the total world supply capacity of 75 million tons. The movement of FSU countries can create rapid changes in the world supply and demand balance for urea fertilizer, and it is foreseen that wide fluctuations will disrupt the international market for coming years.

3. Some examples of other countries

During the 1980s, the worldwide excess capacity accompanied by a rapid fall in the price of naphtha caused a slump in the international market for urea fertilizer, with annual market fluctuations of about $60/ton (See Figure 10). Fertilizer plants which did not have a production cost advantage over those in nearby countries were forced to operate at a loss every time the international market slumped.

A urea fertilizer plant which started up in country M in the mid-1980s production capacity of about 500,000 tons/year of urea fertilizer, the equivalent of 330,000 tons/year of ammonia had total construction costs in excess of $500 million and used domestically produced natural gas as its raw material. This plant made country M, formerly dependent on imports for 100% of its urea fertilizer, self-sufficient in this product by the late 1980s. However, it appears that this plant, whose urea fertilizer production costs are estimated to be US$180/ton, loses about $40 million per year when it is forced to ship its product at, for example, US$100/ton.

In the late 1980s, a plan was prepared for the construction of a government operated urea fertilizer plant in country T (to produce about 670,000 tons/year of urea fertilizer), but the country's National Fertilizer Corporation, which was the body in charge of the project, doubted the conclusions of the feasibility study performed by an international aid organization and asked a university professor, who was neutral regarding the project, for a reassessment. This aroused public concern with the planned project, which was eventually canceled. The report on the reassessment was more than just a financial analysis of the future profitability of the fertilizer plant and of the repayment plan for international aid. It included analysis of the effects of the project on the agricultural sector, inflow and outflow of foreign currency, and on the domestic direct financial market, along with its potential contribution to the creation of employment opportunities and to the transfer of technology. The report pointed out that fertilizer prices, the factor with the greatest impact on the profitability of a fertilizer plant, were difficult to predict as a consequence of the severe fluctuations characteristic of the international fertilizer market. The final conclusion was that with the current market price fluctuations of $60/ton annually, the construction of a fertilizer plant would be extremely risky, not only for project profitability, but for he national economy as well. For this reason, the project was cancelled.

In the late 1980s, country B completed, at a cost of just under $ 1.5 billion, three urea fertilizer plants that use domestically produced natural gas as their raw material (each with production capacity of about 500,000 tons/year of urea fertilizer, the equivalent of 330,000 tons/year of ammonia). This 1.5 million ton increase in supply capacity not only provided country B with self-sufficiency in this product, but also let it become an exporting nation. These three plants, whose production costs are estimated at US$ 115/ton appear to have suffered a loss of more than $20 million per year when forced to ship their product at, for example, US$100/ton,for example.

The construction of a capital-intensive urea fertilizer plant is possible only by the injection of a large amount of foreign capital. It is essential to consider not only agricultural policies and the use of natural gas, but to also forecast future international supply and demand and to make sure that the plant will be cost-competitive enough to survive fluctuations in the international market.

V. Cement

It has been estimated that the demand for cement in ASEAN countries will increase at an annual rate of over 10% because of their rapid growth, in building demand and construction of their infrastructures. While many plans for increasing cement production capabilities are being made in response to this increasing demand, it can be predicted that the shortage of cement will continue beyond the year 2000, even if the planned production expansion is accomplished. It can also be predicted that the shortfall of cement must be filled with imported cement, coming mainly from Japan, as is the current situation

Cement is a primary construction material used for improvement and construction of infrastructures and buildings. Since cement is bulky and transportation costs are relatively large in the total cost, the cement

industry is typically a low value-added "Regional industry." In ASEAN countries where cement bags are typically delivered by trucks and the cement is "field mixed." On site, the biggest cost component is transportation. ASEAN countries are highly motivated to replace cement imports with their own production capacity to meet increasing infrastructure improvement demands and to fix their trade imbalances. However, only Thailand has an export capacity and all other ASEAN countries depend on imports.

Viet Nam is blessed with excellent conditions conducive to a domestic cement industry such as abundant limestone resources, and an increasing demand due to a boom in construction. However, although plant investment is small compared with petrochemicals and steel, investment returns in the cement industry take a long time because of its special characteristics as a plant industry. Production capacity of the Viet Nam Cement Corporation is currently limiteddue to a lack of funds and difficulties in obtaining domestic private investment. Therefore, the strengthening of capacity inevitably depends on direct investment by foreign entities.

The aforementioned conditions appear to be attractive for foreign investment, but some investors are apprehensive about the stability and transparency of the government industrial policy on matters such as the outlook for utility prices and the transfer of profit outside the country. Cement demand will increase in the future as the economy grows in East Asian countries. A cement plant can have an international competitive edge if it is located near a limestone mine and has a facility that can accommodate 30 to 50 thousand ton-bulk ships. At present only a few plants, such as Mitsubisi Material's Kanda Plant in Japan, have international cost competitiveness in East Asia. Coastal cement plants in Viet Nam have strong potential for development into trade bases with international competitiveness. However, yet to be resolved are factors, such as the sharing of costs required for improvement of the infrastructure, like ports and transportation facilities.

Cement industry policy requires a careful plan for expanding plant capabilities based on the various estimated demands, and unique characteristics of local industries. Local imbalances of supply and demand can cause profit instability for enterprises, even if supply and demand are well balanced at the national level. Once domesstic capital has been fully accumulated, domestic investors will rush into cement plant construction, because advanced skills are not required. Downstream industries in packing, loading, and transporting, can create sizable employment. Cement and its downstream industries can be a core in regional industry development.

1. Unique environment of the cement industry in Viet Nam

(1) Primary characteristics of the cement industry

Cement is an important primary construction material that supports construction of infrastructure and buildings. It is primarily a "local industry," because cement is bulky and cheap in cost per ton, thereby incurring substantial transportation costs, and it can easily deteriorate. In ASEAN countries bagged cement is delivered by trucks and "field mixed," so the largest cost component is transportation. Approximately 300 million U. S. dollars are required to construct a plant with an annual capacity of 1.4 million tons, a typical cement plant level. Therefore, plants must be operated efficiently to counter balance the fixed initial investment cost.

(2) Positioning as a major industry

It will be extremely important to see how governments respond to the increasing demands for cement and how they intend to assure an adequate supply, at stable prices, for infrastructure improvements and new construction. In addition, the governments of all ASEAN countries have strong intentions to reduce their imports by strengthening their production capacity, thereby improving their import substitution.

(3) View point on the profitability of cement manufacturing plants (See Fig. 12)

Judging from existing cement manufacturing plants, Viet Nam is blessed with excellent conditions such as; a) abundant limestone resources, b) increasing cement demand due to the construction boom, c) comparatively tight supply and demand in the East Asian Region, d) high transportation cost, and e) no

substitute available. Conversely, the requirement for a large investment is only an obstruction for newcomers. It should be noted that a number of investors in the country can rush into the construction of plants once domestic capital has been fully accumulated because advanced skills are not required for cement industry construction, and this can result in a glut.

2. Outlook for supply and demand in the East Asian region (See Table 11)

(1) Rapid growth in the East Asian region between 1985 and 1995

In this section, we will review the outlook for the supply and demand of cement in 10 countries in the East Asian Region, including the six ASEAN countries of Singapore, Malaysia, Thailand, Indonesia, the Philippines, and Viet Nam, and the East Asian countries of Korea, Taiwan, Hong Kong, and Japan.

1) Rapid increase in demand (tripled in the last 10 years, to 180 million tons)

The rapid increase in demand started back in 1987 in this region. Before that time, the economy had been depressed, and cement demand had been erratic. At that time there were no physical distribution systems for cement in the East Asian Region because the unique characteristics of cement made it primarily a "field mixing industry."

The rapid increase in cement demand in Korea and Taiwan began in 1987 under such situations. The demand increased by 80% in these two countries after five consecutive years of double-digit annual growth. ASEAN countries caught up with the trend of expansion at an annual rate of approximately 20% As a result, the demand (estimated) of all countries, except for Japan, in 1995 increased by two or three times, and the combined demand of ASEAN countries, Korea, Taiwan, and Hong Kong reached 180 million tons.

2) International cement trade increased because of delays in improving production capacity

As demand rapidly increased, production capacity was vigorously improved in all countries. The production capacity of ASEAN countries and Korea, Taiwan, and Hong Kong increased from 90 million tons in 1985 to 164 million tons in 1995, an increase of 1.8 times based on kiln output, but the demand has still not been satisfied.

International cement trade in the East Asian Region increased accordingly. As it is more natural for cement, which is bulky and costly to transport, to be self-supplied in each country, it is surprising to see that a large quantity of cement, over 40 million tons, is currently being traded within the region.

(2) Outlook for tight supply and demand in the east Asian region

Between 1995 and 2000, a production capacity increase of 76 million tons is planned in Korea, Taiwan, Hong Kong, and the ASEAN countries. It can be presumed that supply and demand will increase at that same rate and that deficiencies will be filled by imports, mainly from Japan, as is the current situation.

1) Strengthening of production capacity in ASEAN countries

A summary of plans for the increase in production capacity, developed by cement associations of all ASEAN countries and compiled by the Japan Cement Association, is shown in Table 1. Presumably the total production capacity of ASEAN countries, Korea, Taiwan, and Hong Kong will rapidly expand from 164 million tons in 1995 to 240 million in 2000, an increase of 50%, if all goes as planned.

The report indicates that the plans include more new plant construction than expansion of existing plants, and that foreign investors tend to favor plants that not only supply local markets, but will also export to various parts of what is deemed a single East Asian market. Conversely countries such as Korea and Taiwan view expansion of existing production capacity negatively because their limestone resources are being exhausted and environmental concerns have become hot issues.

In the following sections, the feasibility of projects to increase cement production of major countries will be discussed.

In China, supply is limited against a roaring demand, and there are potential needs, particularly for high class cement ("normal Portland cement" in Japan) for use in large-scale construction projects. For this reason, the government has established a program to modify an estimated 7,000 old vertical kilns, to rotary type kilns, with the aid of foreign investment. However since land is expensive and inland markets are small,

and since there is little cost difference between new construction and old plant modification, foreign investors tend to favor new construction at new sites that are conducive to cement exporting. Considering the disparity in economic strength between the north and the south, it cannot be expected that the expansion of the markets north of the Yangtze River will equal that of those south of the river, which have as a core the Special Economic Zone. Prospective investor countries include Korea, Taiwan, and Hong Kong. Countries that also intend to secure supply sources for their own country include Thailand, and European countries (France, Sweden, etc.), as well as Japan.

Meanwhile, Indonesia is the first ASEAN country to show movement towards increasing production capacity. There are more than 30 projects that have been approved by the BKPM (Investment and Development Agency). However, while the supply of cement is tight it can be presumed that speculative projects for securing investment margin will be included. Even with the expansion of the existing plant of India Cement, the leading cement company in the country, and with construction of a large-scale plant in Kalimantan in joint venture with a Korean investor, both of which are to be completed by 2000, the production capacity increase will be limited to only 1.4 millions tons. It is predicted that production capacity will increase by at least six million tons in Thailand with new construction underway by TPI Corporation, a chemical manufacturer, who broke into the tight market dominated by Siam Cement Company, Siam City Cement Company, and Jalaparatun, and with planned Taiwan Cement's eminent joint-venture plant with a domestic company. In Malaysia, six capacity expansion projects, including one with the cement industrial association, have been announced to solve the tight supply situation, but the increase in capacity will probably be limited to only five million tons by only three of them because cement prices are controlled and profitability can become a hot issue.

2) Significant expansion of demand in ASEAN countries

In ASEAN countries, since the expansion of internal demand measured against the growth of GDP roughly exceeds an elasticity coefficient of 1, it can be presumed that the cement market is under expansion. From the cement consumption per capita numbers (Fig. 13) and the low supply levels of cement in the past (Table 12), it can be estimated that the market will continue to expand as the economy develops, a different situation than that of advanced countries where cement markets have already matured.

According to the estimates made by the Japan Cement Association, it can be presumed that the cement demand in Korea, Taiwan, Hong Kong and the ASEAN countries, which will total 180 millions tons in 1995, will quickly expand to 257 million tons in 2000, and that the problem of excessive demand will continue in these areas. (See Table 11&13)

3) China as an uncertain factor

The gigantic internal demands of China and its manufacturing plants are an uncertain factor for international trade in the East Asia Region. According to the World Statistical Review by CEMBUREAU, apparent consumption in China reached nearly 360 million tons in 1993, but it was deemed that the demand had almost been satisfied by the plants within the country. Exporting from the internal areas of China is impractical because of high transportation costs. It can be predicted that the exports from the Japanese joint-venture plants on the coast of China will be limited to less than 3.5 million tons in 2000 and that these exports will not greatly affect international trade in the East Asia Region.

3. View of foreign investors

(1) Understanding the roaring internal demand

Cement manufacturers in overseas countries focus attention on business environment issues such as; a) rich limestone resources, b) rapidly increasing internal cement demand due to the construction boom, and c) high transportation costs; and regard Viet Nam as one of the most promising countries for investment. Prior to planning the construction of new plants, studies should first focus on the rapidly increasing cement demand in the country, and next on the downstream market of secondary products and exports.

(2) Stability and transparency of policies

There are many ASEAN countries where various regulations exist. Sometimes, exports and imports are regulated to protect domestic industry. In other cases, there exist price controls that assure a stable supply. Indonesia does not allow the retailing of cement by foreign investors. Malaysia regulates the price of cement as controlled goods and has not allowed a price increase for over 10 years. Foreign enterprises desiring to develop their business in a country would look at the stability and transparency of policies, including cement price control policy, future prices for utilities, and profit transfer outside the country. Those desiring to export cement would point out that cost sharing for infrastructure improvement projects such as ports and transportation facilities are an uncertain factor.

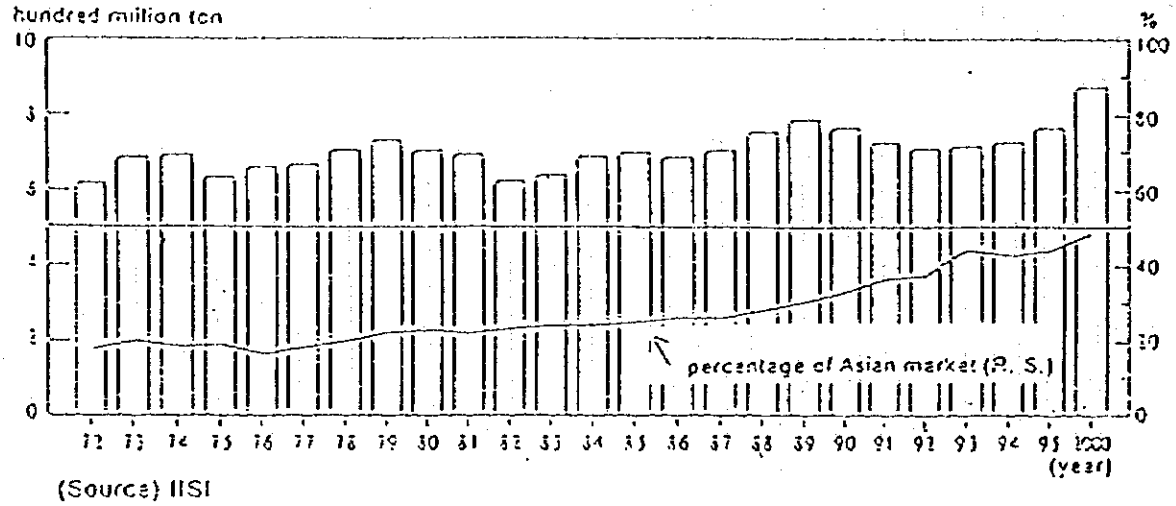


Figure 1 World apparent steel consumption

Table 1 Steel consumption by area (unit : %)

year	Total	EU12	USSR	US	Asia					Others
						Japan	China	Korea	Taiwan	Others	
72	100		19.3	22.1	16.3	11.0	4.1	0.3	0.0	1.4	19.4
80	100	16.3	21.1	16.2	23.2	10.3	6.1	0.7	0.9	3.7	23.1
85	100	14.2	22.4	15.2	25.0	9.4	9.9	1.2	0.9	1.6	23.2
90	100	16.0	19.7	13.5	33.3	12.8	8.8	2.8	2.0	4.1	17.4
93	100	15.2	9.6	14.7	44.5	12.2	16.8	4.1	3.4	5.3	16.0
95	100	16.0	8.1	15.1	43.9	11.5	15.5	4.6	3.9	5.5	16.9
2000	100	14.7	8.0	12.4	48.1	10.7	18.7		18.7		16.7

Table2 (a) Trade balance of steel products in Asia ('93)

(unit : 1000ton)

	import	export	export - import
China	36,260	1,051	-35,209
Korea	5,172	11,305	6,133
Taiwan	14,889	2,699	-12,190
Thailand	6,870	255	-6,615
Singapore	3,563	795	-2,768
Malaysia	4,385	1,047	-3,338
Philippines	2,346	29	-2,317
Indonesia	2,586	783	-1,803
India	1,379	763	-616

-22,898

-58,107

-58,723

Table2 (b) Steel supply and demand in Asia (incl. Japan and China)

(unit : 1000ton)

year	consumption	crude steel production (A)	crude steel consumption (B)	steel balance (A-B)
1984	158,336	187,311	187,049	262
85	169,324	193,316	197,524	-4,208
86	172,759	194,257	200,907	-6,650
87	182,783	202,787	212,021	-9,234
88	196,631	219,538	230,215	-10,677
89	211,157	228,396	244,954	-16,558
90	225,284	238,466	261,640	-23,174
91	236,991	249,126	274,160	-25,034
92	232,320	250,726	271,545	-20,819
93	278,093	268,585	324,497	-55,912

Table2 (c) Steel balance by area (FY93)

(unit : 1000ton)

	production (A)	consumption (B)	steel balance (A-B)
EC	132,182	103,880	28,302
Other Europe	25,915	23,996	1,919
Europe	158,096	127,875	30,221
Eastern Europe	29,788	15,868	13,920
USSR	97,849	80,810	17,039
N. America	113,044	126,375	-13,331
S. America	33,722	20,622	13,100
Africa	14,002	17,315	-3,313
Middle East Asia	6,874	14,864	-7,990
Asia	268,585	324,497	-55,912
Oceania	8,683	6,627	2,056
World	730,644	734,889	-4,245

Table3 (a) Investment programs in Thailand

Company	Facility	Capacity (1,000tons)	Year of Start-up	Remarks
Thaisteel	¥ Stainless plates		Jan 1994	Established mainly with Usinor (France), ILVA (Italy) and other companies participated.
Sahaviriya Group	¥ Hot rolling mill	2,400	Feb 1994	Hot rolling, cold rolling and galvanizing plants were constructed in the same area. The hot rolling mill is a joint venture with a Italian company.
	¥ Cold rolling mill	510	Undecided	In the planning stage with the participation of NKK and Marubeni.
Thai Coated Steel Sheet (TCS)	¥ Galvanizing line	135	Feb 1994	Commercial operation from Apr 1994. A joint venture between Sahaviriya and NKK, Marubeni and C. Itoh.
Saiam Yamato Steel	¥ Electric furnace ¥ Continuous casting (billet,bloom) ¥ Wide flange beam mill	600	Trial operation started in Nov 1994	First wide flange beam mill in Thailand. A joint venture between Yamato Kogyo (Japan) and Siam Cement Group.
Siam Iron & Steel	¥ Electric furnace (40 ton)	160	Mid-1994	Present capacity is 240,000 t/y.
Siam Construction Steel	¥ Steel bars (capacity increase)	100	Within 1994	Increase from the present 300,000 t/y to 400,000 t/y.
Bangkok Iron & Steel Wks	¥ Wire mill	250	Early 1995	Using imported billets. (Present capacity is 250,000 t/y.)
Nansheng Steel	¥ Electric furnace ¥ Steel part/wire mill	250	Mar/Apr 1996	New mini-mill project.
Siam Cement Group	¥ Cold rolling mill	800-1,600	1997	License application in Aug 1994. Nisseo Steel Corporation and Mitsui & Co.,Ltd. are participating.
United Iron Steel	¥ ORI plant	750	1998	Investment by a Thai government related public corporation and an steel company.

Source : Prepared by the Japan Iron and Steel Federation based on various information. The same up to Table13.

Table 3 (b) Investment programs in Indonesia

Company	Facility	Capacity (1,000tons)	Year of Start-up	Remarks
Krakatau Steel	¥ ORI capacity increase	800	Jan 1994	Present 1.5 million t/y to be increased to 2.3 million t/y.
	¥ Electric furnace	800		
	¥ Continuous casting (slab)			
	¥ Hot rolling mill	700		Present 1.8 million t/y to be increased to 2.4 million t/y.
Hanil Jaya Metal Wks.	¥ Steel bar/wire mill	250		Presently producing 120,000 t/y steel bars and 180,000 t/y billets. Shortage of billets after the operation of the new mill will be imported.
Kodeco	¥ Hot rolling mill	1,200	End of 1997	To be constructed in the southern part of Kalimantan. The final survey will be finished and investment companies be decided within the year.

Table 3 (c) Investment programs in Malaysia

Company	Facility	Capacity (1,000tons)	Year of Start-up	Remarks
Perwaja Steel (Kemaman Plant)	· DRI plant (HYL)	1,200	Oct 1993	
	· 2 electric furnaces (73 t/ch)	700	Early 1995	DC furnaces, order placed in Nov 1993
	· Continuous casting (blooms)		Early 1995	Order placed in Nov 1993.
(Gurun Plant)	· Large size section mill	700	Early 1995	
Amalgamated Steel Mills	· Capacity increase	250	1/4 1994	Increase from present 500,000 t/y to 750,000 t/y.
Ornasteel	· Cold rolling mill	300	Mid-1994	
Antara Steel	· Shape steel mill	200-250	Spring 1993	
Malayawasata Steel	· Construction of electric furnace (80 t/ch)	450	Early 1995	Present capacity is 160,000 t/y converter, 24,000 t/y electric furnace and 410,000 t/y steel bar.
	· Continuous casting (billet)		Early 1995	
Mega Steel	· Hot rolling mill	1,800	Late 1995-early 1996 (first stage)	Mini-mill established by ASM in 1989 for the purpose of manufacturing steel plates, etc.
Ipsantara Steel	· Hot rolling mill	1,500	1997	Technical cooperation by Mitsubishi Heavy Industry.
Saba Gas Industries	· HBI Plant	1,000	1997	Owned by the steel enterprises group including ASM, Southern Iron & Steel, Malayawasata. Present production is 600,000 t/y.

Table 3 (d) Investment Programs in the Philippines

Company	Facility	Capacity (1,000tons)	Year of Start-up	Remarks
F. Jacinto Group	· Integrated steel production by Corex/DRI (Midrex) DC electric furnace/thin slab continuous casting	800	1998	Capital participation of Ting Tiek (Malaysia), ISCOR (South Africa) and a Taiwan steel maker are also expected to join. It was reported that secondhand facilities of BSC Ravenscraig Steel (shut down in 1992) were to be introduced.
Milwaukee Industries	· Electric furnace (40/50 t/ch)			DC furnace. Contract has been signed.
Cathey Pacific Steel	· Wire mill	300	1st Quater 1993	Present capacity is 150,000 t/y steel production and 300,000 t/y rolling.
Philippine Steel Coating	· Galvanizing line	200	1996	Cooperation with a foreign enterprise is expected.

Table 4 Asia · Pacific refinary balance

(unit : 1,000bbl/d)

	1993(acutual)				1997(projection)				2000(projection)				rate of operation	
	capacity A	throughput B	demand C	balance B-C	capacity A	throughput B	demand C	balance B-C	capacity A	throughput B	demand C	balance B-C	1997	2000
China	3,160	2,436	2,682	-246	4,030	3,103	3,504	-401	4,340	3,472	4,224	-752	77%	80%
Korea	1,675	1,490	1,550	-60	2,501	2,250	1,947	303	2,001	2,521	2,188	333	90%	90%
Taiwan	600	499	612	-113	900	792	676	116	1,120	986	732	254	88%	88%
Philippines	300	286	260	26	396	376	341	35	396	376	420	-44	95%	95%
Hong Kong	0	0	211	-211	0	0	256	-256	0	—	362	-362	—	—
Indonesia	867	825	800	25	1,040	988	1,012	-24	1,040	988	1,197	-209	95%	95%
Malaysia	233	234	317	-83	495	446	370	76	495	470	441	29	90%	95%
Thailand	355	363	528	-165	730	693	750	-57	770	732	900	-168	95%	95%
Vietnam	1	1	66	-65	139	125	93	32	164	148	120	28	90%	90%
Singapore	1,062	1,084	410	674	1,199	1,079	443	636	1,199	1,079	475	604	90%	90%
East Asia	5,093	4,762	4,754	8	7,400	6,749	5,608	861	7,985	7,300	6,835	465	Ave. 91%	Ave. 91%
Pakistan	91	90	204	-114	91	90	279	-189	121	121	354	-233	100%	100%
India	1,065	1,065	1,176	-111	1,385	1,316	1,588	-272	1,878	1,784	2,040	-256	95%	95%
Sri Lanka	50	49	34	15	50	50	51	-1	50	50	68	-18	100%	100%
South Asia	1,206	1,204	1,414	-210	1,526	1,456	1,918	-462	2,049	1,955	2,462	-507	Ave. 95%	Ave. 95%
Australia	705	657	696	-39	705	670	737	-67	705	670	778	-108	95%	95%
Total	10,164	9,059	9,546	-487	13,661	11,978	12,047	-69	15,079	13,397	14,299	-902	Ave. 88%	89%

Source : PAJ

Table 5 Refinary balance by area

	1993(actual)	1997(projection)	2000(projection)
China	-24.6	-40.1	-75.2
East Asia	0.8	86.1	46.5
South Asia	-21.0	-46.2	-50.7
Australia	-3.9	-6.7	-10.8
Total	-48.7	-6.9	-90.2

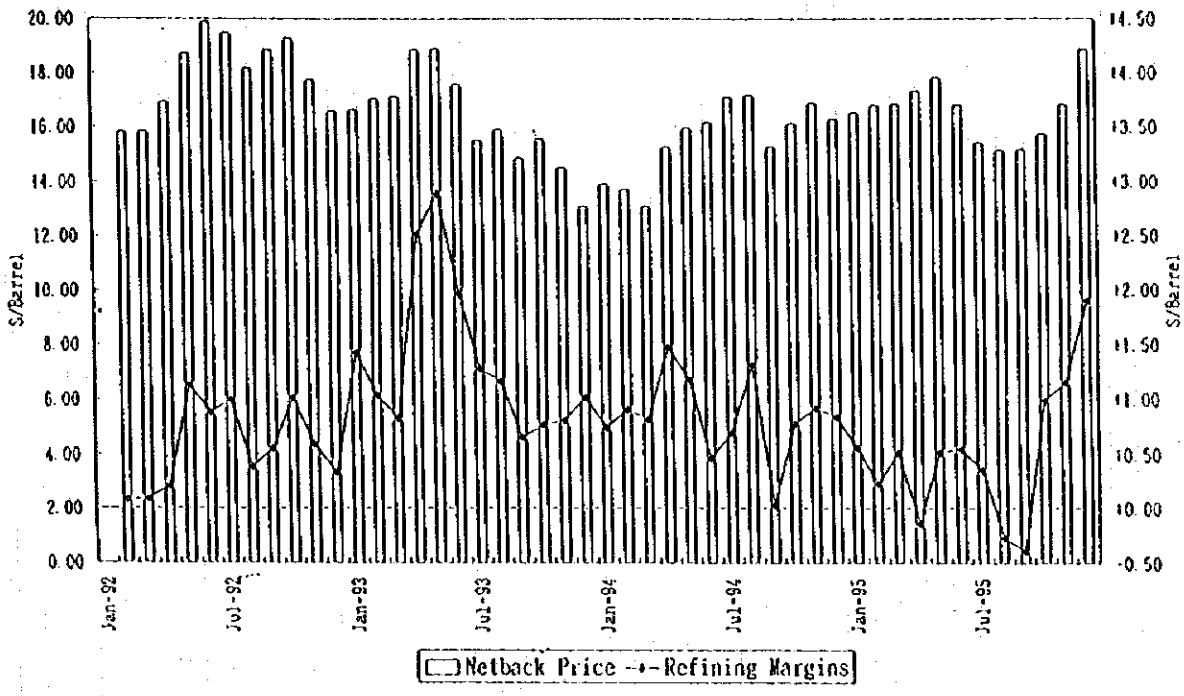
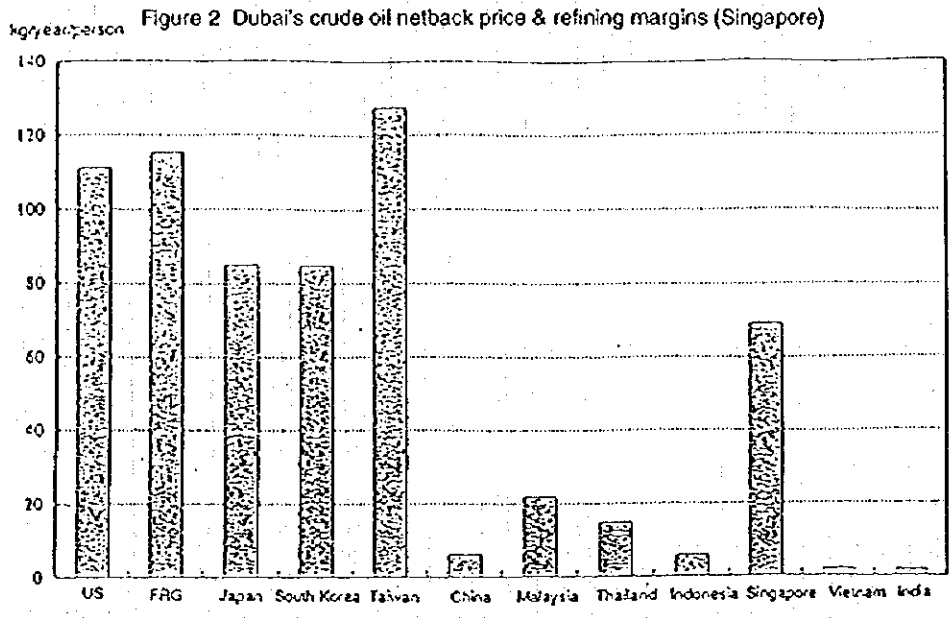
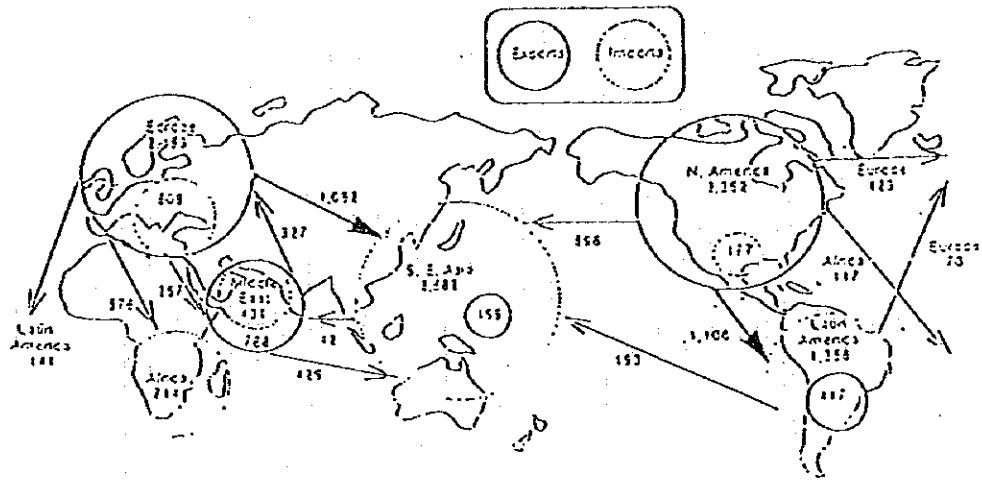


Figure 2 Dubai's crude oil netback price & refining margins (Singapore)



Source : Compiled by JDB from 1994 International Plastic Corporation Executives Conference documents.

Figure 3 Annual per capita consumption of plastic(1993)



Source : International Trader Publishing Inc.

Figure 4 Synthetic resin trading 1994 (1000tons)

Table 6 Petrochemical consumption (Ethylene base)

(unit : 1000T)

	actual			Forecast					
	1992	1993	1994	1995	1996	1997	1998	1999	2000
Asia	10,423	11,405	12,897	13,940	15,103	16,452	17,794	19,236	20,814
Oceania	538	621	669	702	731	761	795	827	861
Europe	16,354	15,997	17,193	17,689	18,201	18,728	19,272	19,829	20,405
Middle east	1,057	1,085	1,258	1,336	1,422	1,514	1,612	1,717	1,829
N. America	18,157	18,363	20,308	20,609	21,222	21,855	22,505	23,302	24,030
S. America	3,631	3,823	4,180	4,419	4,648	4,853	5,137	5,531	5,833
Total	53,175	54,232	59,314	61,500	64,196	67,163	70,263	73,754	77,244

Table 7 Petrochemical balance

(unit : 1000T)

	actual			Forecast					
	1992	1993	1994	1995	1996	1997	1998	1999	2000
Asia	-3,696	-3,601	-4,351	-4,487	-4,259	-4,270	-4,903	-5,548	-6,101
Oceania	-180	-214	-259	-292	-321	-351	-344	-376	-410
Europe	158	88	259	164	78	302	266	-348	-731
Middle east	1,620	1,646	2,070	2,127	2,383	2,744	4,038	4,367	4,763
N. America	3,089	2,858	2,900	2,864	2,713	2,704	2,643	2,606	2,592
S. America	-96	-81	-103	-132	-152	-216	-431	-719	-945
Total	1,217	840	658	567	722	1,243	1,626	223	-278

Table 8 Projection of ethylene capacity

(unit : million ton)

C.Y		World	Asia	Korea	Taiwan	China	Asean	India	Europe	N. America	Middle east
1989		60.8	10.4	1.2	1.0	2.1	0.4	0.3	15.2	20.0	2.8
1994		76.7	15.3	3.6	1.0	2.3	1.3	0.6	19.4	24.9	3.9
2000		95.9	22.3	3.6	2.4	4.4	2.9	2.2	20.5	30.2	7.1
Incremental Capacity	89-94	15.9	4.9	2.4	0.0	0.2	0.9	0.3	4.2	4.9	1.1
	94-2000	19.2	7.0	0.0	1.4	1.9	1.6	1.6	1.1	5.3	3.2
average growth	89-94	4.8%	8.0%	24.6%	0.0%	1.8%	26.6%	16.1%	5.0%	4.5%	6.8%
	94-2000	3.8%	6.5%		15.1%	10.4%	13.5%	26.1%	0.9%	3.3%	10.6%

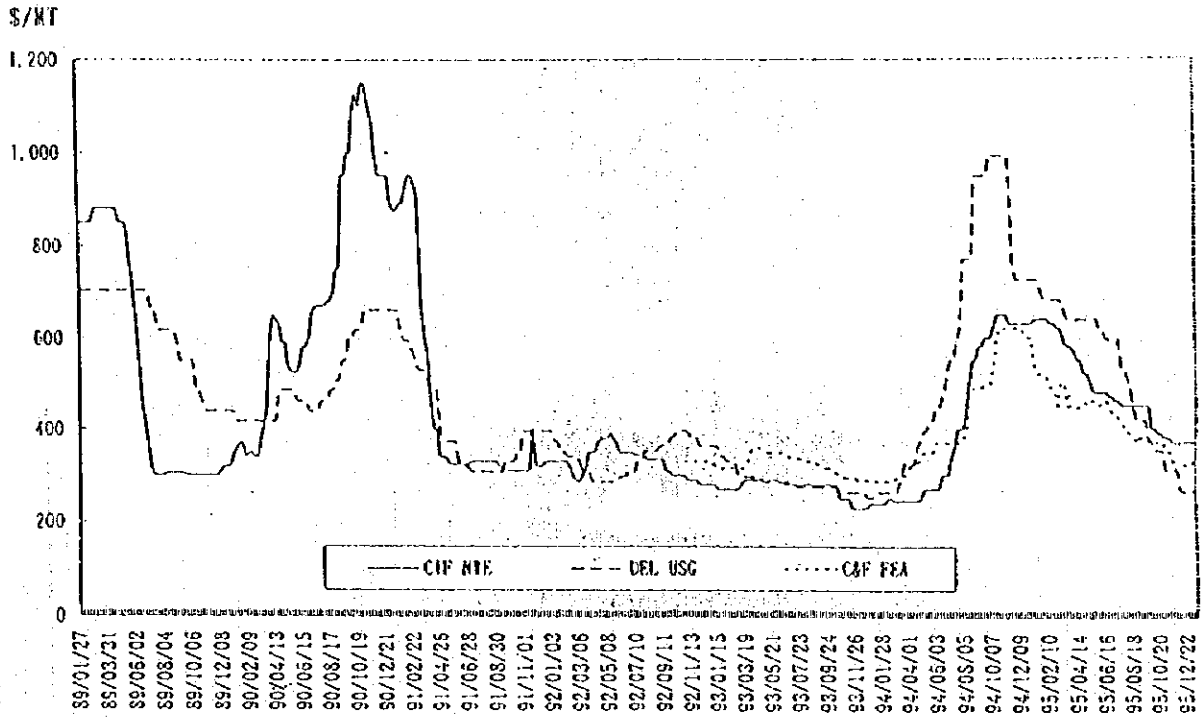


Figure 5 Ethylene (SPOT)

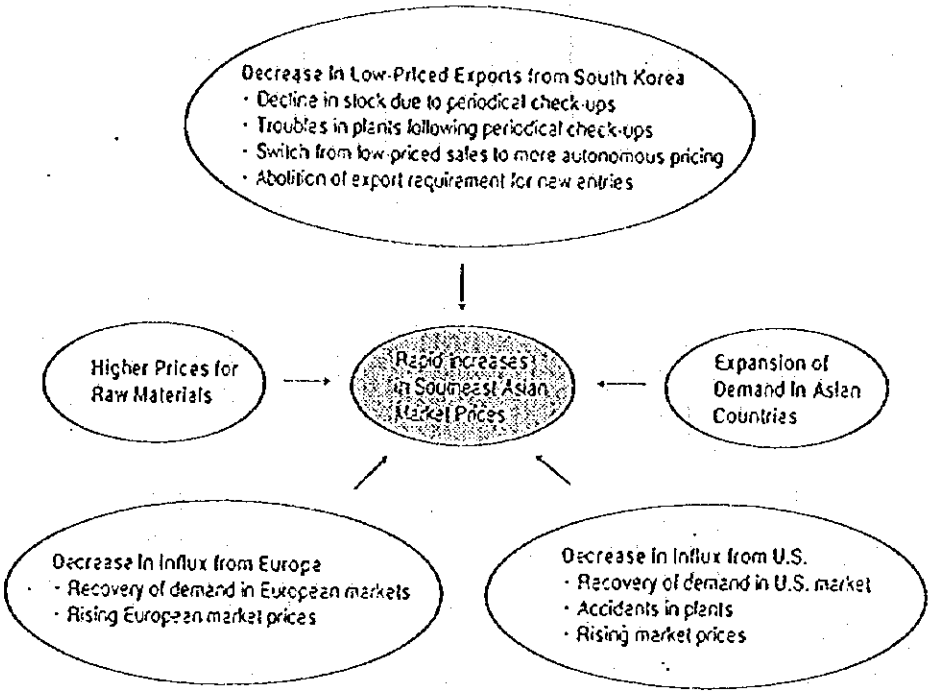
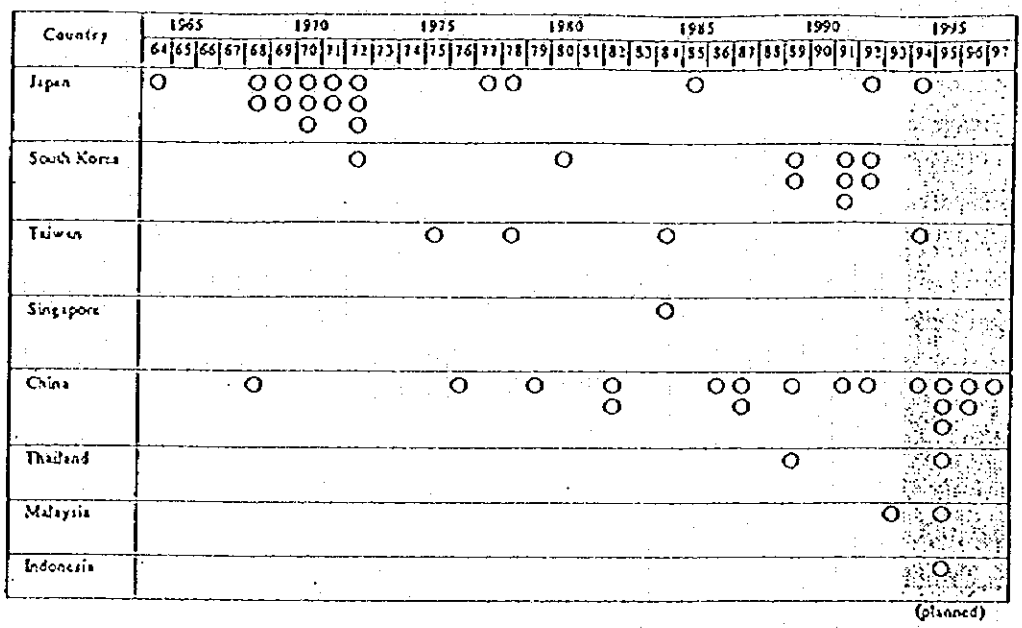


Figure 6 Background for rapid increases in Southeast Asian market prices (polyolefin)



Note : Start up of each ethylene is indicated by (does not include enliargements of capacity).

Source : Council on the Supply and Demand of Petrochemicals, Sekiyu Kagaku Seihin no jukyu Doko.Research undertaken by Basic Chemicals Division, MITI.

Figure 7 Operation period of ethylene plants in Asia

Table 9 Urea fertilizer : world supply & demand

(Unit:1,000Nt,%)

		70/71	71/72	72/73	73/74	74/75	75/76	76/77	77/78	78/79	79/80	80/81	81/82	82/83	83/84	84/85
a	Production	32,967	34,885	37,789	40,498	42,514	43,847	46,225	49,611	55,907	59,729	62,602	62,035	63,430	67,810	74,505
b	Available World Supply	32,227	33,519	35,851	38,816	40,610	42,200	44,380	47,880	53,700	57,600	60,700	60,200	66,900	67,230	71,240
c	Consumption	31,824	33,324	35,771	38,657	38,596	43,140	45,115	47,768	53,762	57,257	60,600	60,443	61,040	67,119	70,514
d	b-c Buffer	403	195	80	159	2,014	-940	-735	112	-62	343	100	-243	5,860	111	726
e	d / b Buffer ratio	1.3%	0.6%	0.2%	0.4%	5.0%	-2.2%	-1.7%	0.2%	-0.1%	0.6%	0.2%	-0.4%	8.8%	0.2%	1.0%
f	Imports	6,763	6,834	7,850	7,955	7,952	8,119	8,777	10,029	11,854	12,642	13,163	12,461	12,871	15,098	16,376
g	f / c Trade ratio	21.3%	20.5%	21.9%	20.6%	20.6%	18.8%	19.5%	21.0%	22.0%	22.1%	21.7%	20.6%	21.1%	22.5%	23.2%

		85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	93/94e	94/95e	95/96e	96/97e	97/98e	98/99e
a	Production	73,386	77,427	82,264	85,482	84,717	81,900	80,606	80,540	79,471						
b	Available World Supply	69,970	72,580	76,720	80,370	80,140	77,398	76,001	76,233	75,129	74,699	75,138	76,156	77,406	78,497	79,240
c	Consumption	69,984	71,479	75,596	79,659	79,078	77,245	75,491	74,520	72,761	72,424	72,720	73,800	75,010	76,150	77,500
d	b-c Buffer	-14	1,101	1,124	711	1,062	153	510	1,713	2,368	2,275	2,418	2,356	2,396	2,347	1,740
e	d / b Buffer ratio	0.0%	1.5%	1.5%	0.9%	1.3%	0.2%	0.7%	2.2%	3.2%	3.0%	3.2%	3.1%	3.1%	3.0%	2.2%
f	Imports	16,343	16,960	18,347	19,765	20,216	19,930	20,458	21,716	21,361						
g	f / c Trade ratio	23.4%	23.7%	24.3%	24.8%	25.6%	25.8%	27.1%	29.1%	29.4%						

Source : FAO Fertilizer Yearbook

World Bank, World and Regional Supply & Demand Balances for Nitrogen

Table 10 Urea fertilizer : supply & demand in Asia

(Unit:1,000Nt,%)

		82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
a	Production	20,252	21,572	24,118	23,965	25,891	28,274	30,213	31,401	31,970	32,280	34,013	33,910
b	Available World Supply												
c	Consumption	23,044	26,166	28,005	27,069	27,748	25,623	34,940	35,910	37,187	37,908	39,802	37,527
d	a-c Buffer	-2,792	-4,594	-3,887	-3,104	-1,857	2,651	-4,727	-4,509	-5,217	-5,628	-5,789	-3,617
e	d/a Buffer ratio	-13.8%	-21.3%	-16.1%	-13.0%	-7.2%	9.4%	-15.6%	-14.4%	-16.3%	-17.4%	-17.0%	-10.7%
f	Imports	4,375	5,433	7,111	6,060	5,698	6,624	7,917	8,303	8,290	8,718	9,345	7,955
g	f/c Trade ratio	19.0%	20.8%	25.4%	22.4%	20.5%	25.9%	22.7%	23.1%	22.3%	23.0%	23.5%	21.2%
h	Share in World	38.1%	42.9%	41.7%	38.4%	39.6%	35.8%	46.2%	45.1%	47.0%	49.1%	52.7%	50.4%

Source : FAO Fertilizer Yearbook

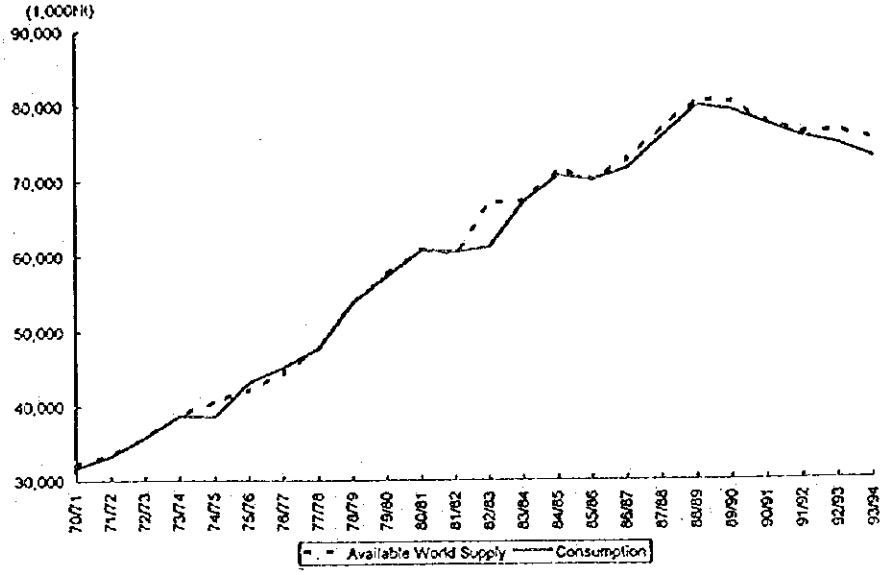


Figure 8 World supply & demand

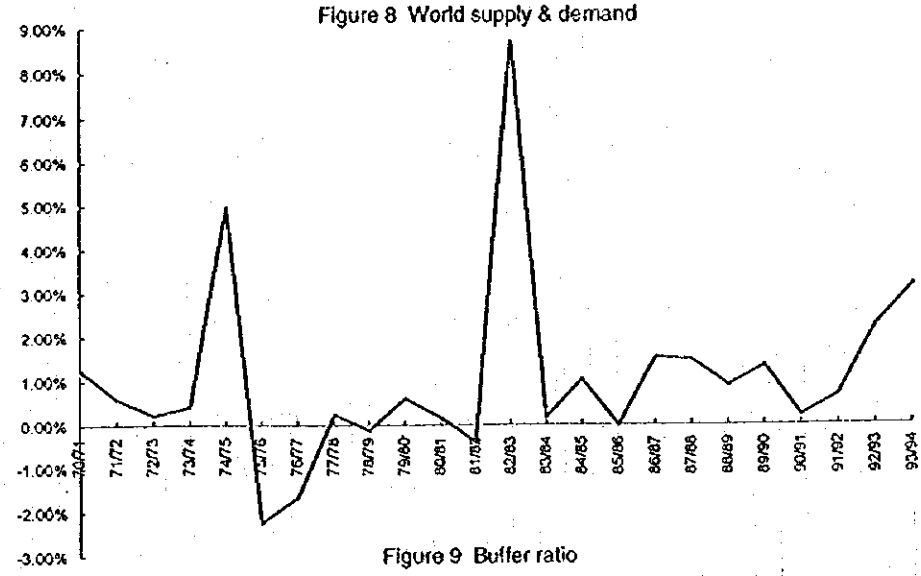


Figure 9 Buffer ratio

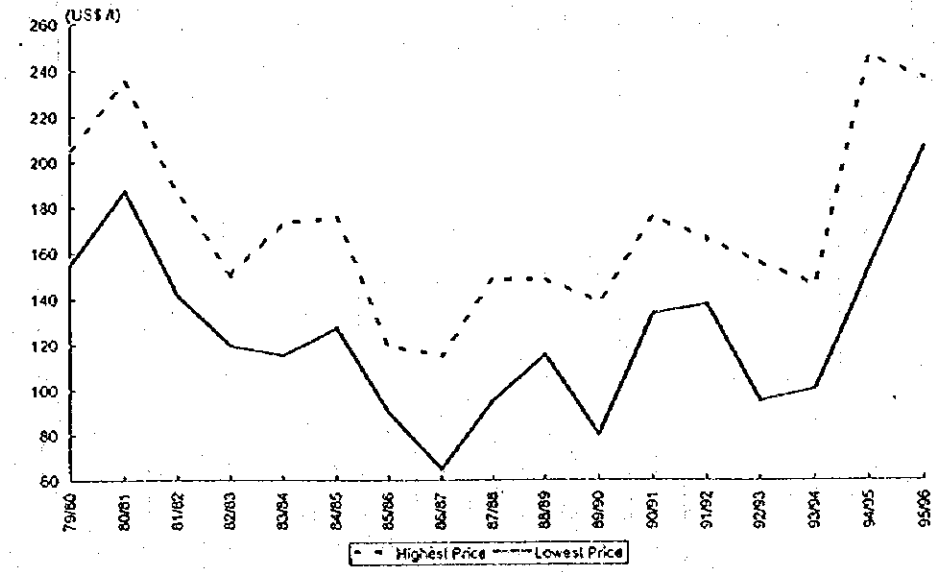


Figure 10 International market price of urea fertilizer

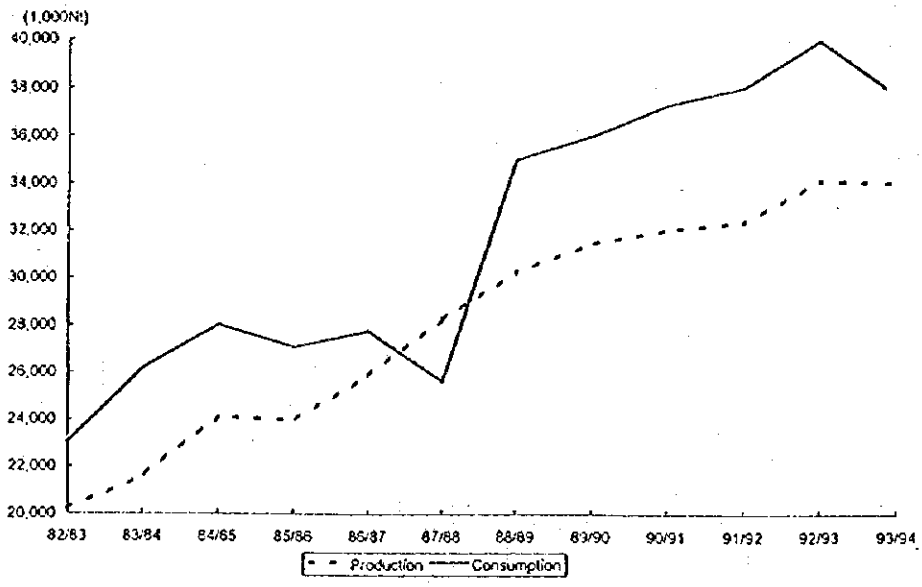


Figure 11 Supply & demand in Asia

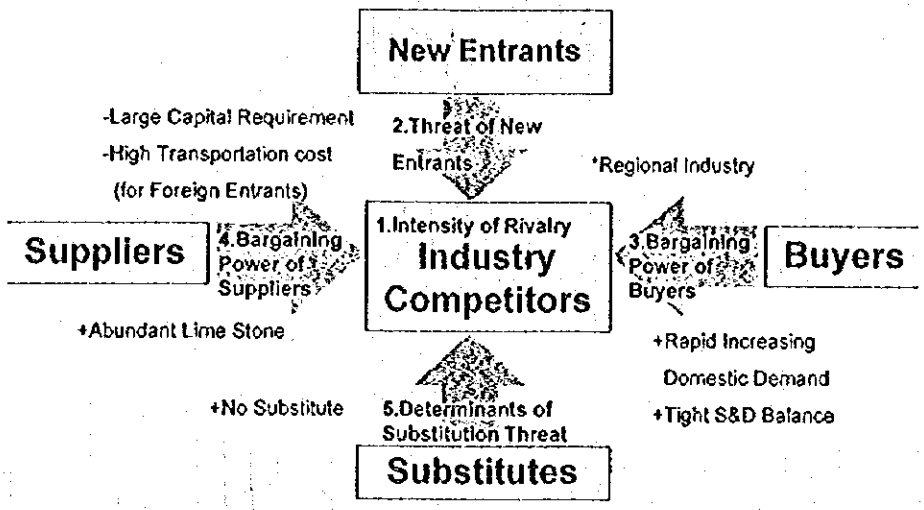


Figure 12 Elements of cement industry structure

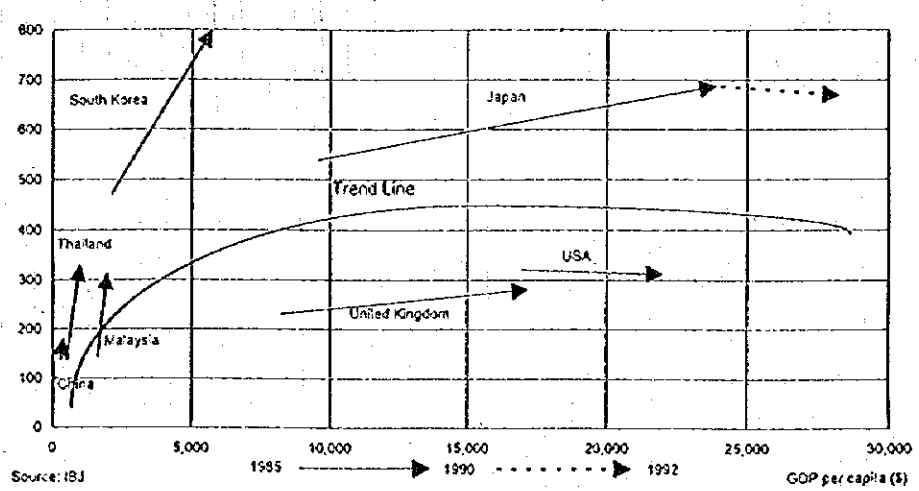


Figure 13 GDP per capita and cement domestic demand per capita

Table 11 Cement in Southeast Asia (million ton)

	ASEAN																				
	SINGAPORE			MALAYSIA			THAILAND			INDONESIA			PHILIPPINES			VIET NAM			(SUB TOTAL)		
	CAPABILITY	APPARENT DEMAND	BALANCE	CAPABILITY	APPARENT DEMAND	BALANCE	CAPABILITY	APPARENT DEMAND	BALANCE	CAPABILITY	APPARENT DEMAND	BALANCE	CAPABILITY	APPARENT DEMAND	BALANCE	CAPABILITY	APPARENT DEMAND	BALANCE	CAPABILITY	APPARENT DEMAND	BALANCE
1985		2.6	-2.6	5.1	4.7	0.4	9.4	7.8	1.6	17.4	9.1	8.3	5.2	2.7	2.5	1.5	1.5	0.0	38.6	28.4	10.2
1986		2.4	-2.4	6.8	3.6	3.2	9.5	7.9	1.6	17.4	9.5	7.9	5.8	3.1	2.7	1.5	1.5	0.0	41.0	28.0	13.0
1987		2.2	-2.2	6.8	3.0	3.8	12.9	9.7	3.2	17.4	9.9	7.5	4.9	4.2	0.7	1.7	1.6	0.0	43.7	30.6	13.0
1988		2.0	-2.0	6.6	3.4	3.2	13.1	11.6	1.5	17.4	10.1	7.3	6.3	5.4	0.9	1.8	1.7	0.0	45.2	34.2	11.0
1989		2.1	-2.1	6.9	4.3	2.6	15.5	15.2	0.3	17.4	11.4	6.0	6.1	6.1	0.0	1.8	1.8	0.0	47.7	40.9	6.8
1990		2.1	-2.1	6.9	5.6	1.3	15.5	18.7	-3.2	17.4	13.8	3.6	6.5	7.6	-1.1	2.5	2.7	-0.1	46.8	50.5	-1.7
1991		2.8	-2.8	6.9	7.2	-0.3	20.9	22.1	-1.2	17.6	15.5	2.1	7.4	6.9	0.5	3.9	3.2	0.7	56.7	57.7	-1.0
1992		3.2	-3.2	7.4	8.2	-0.8	32.9	22.8	10.1	19.4	15.8	3.6	7.8	7.3	0.5	3.9	3.9	0.0	71.4	51.2	10.2
1993		3.7	-3.7	8.2	8.8	-0.6	32.4	25.6	6.8	19.7	17.8	1.9	7.9	8.0	-0.1	3.9	5.0	-1.1	72.1	68.9	3.2
1994P		4.0	-4.0	8.6	10.0	-1.4	32.3	29.1	3.2	22.4	21.5	0.9	9.1	9.6	-0.5	3.9	6.5	-2.6	76.3	80.7	-4.4
1995E		4.3	-4.3	8.6	11.5	-2.9	35.4	34.4	1.0	24.7	25.4	-0.7	10.6	11.5	-0.9	5.0	7.4	-2.4	84.3	94.5	-10.2
1996E		4.0	-4.0	10.4	13.2	-2.8	41.9	39.4	2.5	26.3	28.4	-2.1	10.6	13.8	-3.2	6.7	8.5	-1.8	95.9	107.3	-11.4
1997E		3.7	-3.7	13.0	14.6	-1.6	49.0	44.8	4.2	36.4	31.2	5.2	17.4	16.6	0.8	8.1	9.8	-1.7	123.9	120.7	3.2
1998E		3.7	-3.7	15.7	15.2	0.5	52.0	50.0	2.0	43.0	34.4	8.6	22.0	19.0	3.0	12.6	11.3	1.3	145.3	133.6	11.7
1999E		3.7	-3.7	17.2	16.8	0.4	53.0	54.4	-1.4	43.0	37.8	5.2	25.9	21.9	4.0	15.0	13.0	2.0	154.1	147.6	6.5
2000E		3.7	-3.7	17.2	18.5	-1.3	53.0	59.3	-6.3	43.0	41.6	1.4	28.7	25.2	3.5	15.0	15.0	0.0	156.9	163.3	-6.4

	EAST ASIA												EAST ASIA / ASEAN			JAPAN			TOTAL		
	KOREA			TAIWAN			HONG KONG			(SUB TOTAL)											
	CAPABILITY	APPARENT DEMAND	BALANCE	CAPABILITY	APPARENT DEMAND	BALANCE	CAPABILITY	APPARENT DEMAND	BALANCE	CAPABILITY	APPARENT DEMAND	BALANCE	CAPABILITY	APPARENT DEMAND	BALANCE	CAPABILITY	APPARENT DEMAND	BALANCE	CAPABILITY	APPARENT DEMAND	BALANCE
1985	28.5	19.0	9.5	20.9	10.6	10.3	1.4	2.8	-1.4	50.8	32.4	18.4	89.4	60.8	28.6	103.3	67.7	35.6	192.7	128.6	64.2
1986	29.9	20.4	9.5	20.6	11.3	9.3	1.4	3.4	-2.0	51.9	35.1	16.8	92.9	63.0	29.9	98.0	68.9	29.1	190.9	131.9	59.0
1987	29.9	22.8	7.1	22.1	12.7	9.4	1.4	3.5	-2.1	53.4	39.0	14.4	97.1	69.7	27.4	98.0	71.2	26.8	195.0	140.8	54.2
1988	30.2	26.2	4.0	22.1	14.2	7.9	1.4	4.0	-2.6	53.7	44.4	9.3	98.9	78.6	20.3	97.9	77.5	20.4	196.7	156.0	40.7
1989	30.6	28.2	2.4	22.4	16.3	6.1	1.4	3.9	-2.5	54.4	48.4	6.0	102.1	89.3	12.8	87.8	78.7	9.1	189.9	168.0	21.9
1990	33.1	34.0	-0.9	22.9	18.1	4.8	1.4	3.8	-2.4	57.4	55.9	1.5	106.2	106.4	-0.2	87.8	84.1	3.7	194.1	190.5	3.5
1991	41.5	44.2	-2.7	22.8	19.2	3.6	1.4	4.0	-2.6	65.7	67.4	-1.7	122.4	125.1	-2.7	89.3	86.5	2.8	211.7	211.6	0.1
1992	47.8	46.7	1.1	23.4	22.9	0.5	1.4	3.5	-2.1	72.6	73.1	-0.5	144.0	134.3	9.7	90.5	82.8	7.6	234.5	217.1	17.3
1993	51.8	46.7	5.1	23.0	27.6	-4.6	1.4	3.6	-2.2	76.2	77.9	-1.7	148.3	146.8	1.5	98.0	79.0	18.9	246.3	225.8	20.4
1994P	55.8	52.7	3.1	22.2	27.2	-5.0	1.4	4.1	-2.7	79.4	84.0	-4.6	155.7	164.7	-9.0	98.0	80.2	17.8	253.7	244.9	8.8
1995E	55.8	55.5	0.3	22.4	26.5	-4.1	1.4	4.0	-2.6	79.6	86.0	-6.4	163.9	180.5	-16.6	98.0	80.0	18.0	261.9	260.5	1.4
1996E	56.6	57.0	-0.4	23.7	26.0	-2.3	1.4	4.0	-2.6	81.7	87.0	-5.3	177.6	194.3	-16.7	97.0	80.5	16.5	274.6	274.8	-0.2
1997E	58.4	57.0	1.4	23.7	26.7	-3.0	1.4	4.0	-2.6	83.5	87.7	-4.2	207.4	208.4	-1.0	97.0	80.0	17.0	304.4	288.4	16.0
1998E	58.4	58.0	0.4	23.7	27.8	-4.1	1.4	3.6	-2.2	83.5	89.4	-5.9	226.8	223.0	5.8	97.0	79.0	18.0	325.8	302.0	23.8
1999E	58.4	59.0	-0.6	23.7	28.9	-5.2	1.4	3.6	-2.2	83.5	91.5	-8.0	237.6	239.1	-1.5	97.0	79.0	18.0	334.6	318.1	16.5
2000E	58.4	60.0	-1.6	23.7	30.0	-6.3	1.4	3.6	-2.2	83.5	93.6	-10.1	240.4	256.9	-16.5	97.0	79.0	18.0	337.4	335.9	1.5

Source: Japan Cement Association, DIR

Tabel 12 Cement accumulation (1913-1991)

(t/km²)

	Japan	USA	UK	China	S Korea	Philippine s
CA/area	5,501	347	2,884	261	3,913	66
Adjusted CA/area	5,501	4,203	4,008	711	2,928	442

CA/area : Cement accumulation per national land area

Adjusted CA/area : adjusted to reflect difference of population density

Source : CEMBUREAU, IBJ

Table 13 Cement consumption per capita and population estimation

Country	Group (kg/p)	Cement Consumption per capita (kg/p) 1995	2000	Population Estimation (million) 1995	2000	% change
Taiwan	1500	1,223	1,304	21.5	23.0	1.4
Singapore		1,433	1,121	3.0	3.3	1.7
South Korea	900	1,233	1,268	45.0	47.3	1.0
Japan	900	645	642	125.6	127.5	0.3
Hong Kong		667	581	6.0	6.2	0.8
Malaysia		575	815	20.0	22.7	2.6
Thailand	400	567	893	60.7	66.4	1.8
Philippines	400	169	329	68.2	76.7	2.4
Indonesia	50	129	193	196.4	215.7	1.9

Source : Cement consumption per capita, Japan Cement Association Population estimation, ADB