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Industrial Development of Indonesia: Challenges and Strategies for Implementation of MP3EI

A Joint Research Paper by
Korea Institute for Industrial Economics and Trade (KIET),
United Nations Industrial Development Organization (UNIDO),
and Asian Development Bank (ADB)

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ADB

UNIDO

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Ⅰ. Introduction

Dong-Joo Joo[1]

1-1. Background and Objective of the Research

This research is part of a joint partnership program between Korean and Indonesian governments. Korea and Indonesia concluded a “Strategic Partnership Agreement” at the Summit Meeting held during the state visit of Korean President Roh Moo-Hyun to Indonesia in December 2006, and agreed to expand bilateral cooperation in full-scale. Both countries have a great potential for economic cooperation, as Korea has a strong industrial production capacity and Indonesia has a huge development potential with its enormous territories and population. Following the agreement, successive Summit and High level meetings were held across the nations. In the process, both countries launched the Korea - Indonesia Economic Cooperation Task Force in 2007, through which a wide spectrum of cooperation issues has been discussed. The TF held two meetings, first in Jakarta in May 2007, and second in Seoul, in March 2010.

Then, after a High-level meeting held in Seoul in February 2011, a Working Level Task Force was established in May 2011. The focal points of this Working Level TF were designated as the Ministry of Knowledge Economy (MKE) of Korea and the Coordinating Ministry of Economic Affairs of Indonesia (CMEA) respectively. This TF held two joint meetings in Bali and Seoul in 2011, and both governments agreed to setup a Joint Secretariat for Economic Cooperation in Jakarta to facilitate and explore practical cooperation issues in the field. This office was open in February 2012 with the government officials and specialists from both countries at service. The annals of major events in recent years between the two countries are shown in <Table 1-1-1>.

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[1] Dong-Joo Joo is the director of the Department for International Development Cooperation at Korea Institute for Industrial Economics and Trade (KIET).

One of the major cooperation issues was the participation in and consulting on the Economic Development Master Plan 2011-2025 (MP3EI) of Indonesia by the Korean side. For this, the Korean government entrusted the famous Korean think-tank, KIET (Korea Institute for Industrial Economics and Trade) as the main consultant to assist the formulation and implementation of the Master Plan. As a preliminary work for this consulting, KIET presented its review opinions on the Indonesian Economic Development Corridors (IEDCs), a Masterplan for industrial development of Indonesia drafted by the CMEA, during the aforementioned High-level meeting in Seoul in February 2011. The IEDC was later incorporated into the MP3EI as a chapter titled as Indonesia Economic Corridors. This chapter is part of the Masterplan focusing on the regional development of the Six Corridors and connectivity between them. The Six Corridors is a term designating the six growth poles encompassing broad regional divisions of the whole Indonesian territory.

Table 1-1-1. Annals of Major Events in the 2010s

	Date	Location	Meeting	Main Content
1	Dec. 9. 2010	Bali, Indonesia	Summit meeting during the 4th Bali Democracy Forum	Korea's participation in the Indonesia's Masterplan
2	Feb. 16. 2011	Seoul, Korea	Ministerial Conference	Discuss the Cooperation focusing on the Masterplan
3	May. 18. 2011	Bali, Indonesia	1st Working Level Task Force meeting	Sign MOU on extensive economic cooperation
4	Oct. 24. 2011	Seoul, Korea	2nd Working Level Task Force meeting	Visualize comprehensive economic cooperation
5	Feb. 28. 2012	Jakarta, Indonesia	Launch a Joint Secretariat	Facilitate economic partnership programs and investment
6	Oct. 11. 2012	Jeju, Korea	3rd Working Level Task Force meeting	Widen and deepen major cooperation projects

KIET is a government-sponsored economic institute of Korea, supervised by the National Research Council of Economics, Humanities and Social Sciences (NRCS) under the Prime Minister's Office. Since its establishment in 1976, it has played an important role as the main think-tank especially for the industrial development plans of Korea. Based on such experiences and accumulated information, KIET has recently carried out consulting works on industrial development plans of developing countries at the request of their government. These activities have been financed by the Official Development Assistance (ODA) of Korea, which has been rapidly increasing in the recent years before and after its admission to the OECD Development Assistance Committee (DAC) in January 2010.

Against this backdrop, this research has been organized by KIET to provide a diagnosis of the status and necessities of industrial development in Indonesia and feasible policy recommendations for the implementation and follow-up of the MP3EI. For this mission, KIET has discussed the detailed topics of research with the Korean and Indonesian governments and has organized a group of specialists from inside and outside its expert pool. Based on the demands from the Indonesian side, the strategic industries to be studied in this research were chosen in the four industrial sectors, which are Automobiles, Consumer Electronics, Shipbuilding, and Clothing & Textiles. KIET has assigned the specialists of each industry from its staff to take up the study on concern. KIET has also requested the Indonesian side to assign their specialists as the counterparts of the Korean specialists, so that both sides may discuss the issues of concern and exchange information.

At the same time, KIET has arranged a partnership with United Nations Industrial Development Organization (UNIDO) and Asian Development Bank (ADB) to cooperate together for this project. As KIET is more specializing in industry-specific researches, it asked the two international organizations to provide their expertise and information on the broader issues, such as the macroeconomic diagnosis and industrial structure of Indonesia. Responding to this request, the two organizations joined this project and provided their insights and information. So, this research has been designed and carried out as an internationally multilateral partnership project, taking advantage of the intellectual capabilities from the two countries as well as two international organizations. The concept of "Partnership" constituted the basis of this project, and it was in effect the most important approach of this research, which will be related in the following section.

Finally, the objective of this research is to provide intellectual inputs to the implementation and follow-up of the industrial development strategies of the Indonesian government. It

should be noted that our mission is not to draw the Indonesian development plans by ourselves, but is to promote Knowledge-sharing between the experts, so that this may help the Indonesian authorities to carry out their own missions. It can be said that the concept of "Capacity Building" has been applied to the process of this research, as it was designed to assist the build-up of policy-making capacities of Indonesian officials through the exchange of ideas, experiences, technical know-how, and strengthening of human networks between international experts.

1-2. MP3EI and Challenges for Economic Growth of Indonesia

MP3EI is the Indonesian acronym for Masterplan Percepatan dan Perluasan Pembangunan Ekonomi Indonesia or, in English, the Master Plan for Acceleration and Expansion of Indonesia's Economic Development. It is a comprehensive economic development plan of Indonesia spanning the years 2011-25. It was prepared according to the directive order of the Indonesia's President Susilo Bambang Yudhoyono on December 30th 2010, and was finalized in May 2011. The legal basis of this Masterplan is Presidential Decree No.32/2011, and a committee named KP3EI coordinates the implementation of the plan (KP3EI Homepage; Strategic Asia, 2012: 7).[2] As the title of the Masterplan reveals explicitly, it was designed to accelerate and expand Indonesia's economic development responding to the challenges Indonesia has been facing especially in the recent global and regional economic environment. It aims to provide the building blocks to transform Indonesia into one of the 10 major economies in the world by 2025.

Indonesia has been already implementing long-term and medium-term economic plans. The Long-term National Development Plan (RPJPN) 2005-2025 has been the basis for development programs for a period of 20 years. The Medium-term National Development Plan (RPJMN) is a supplementary plan to implement the Long-term Plan by dividing the 20 years into multiple 5 year terms, and currently the second 5-year Medium-term Plan 2009-14

[2] KP3EI is the Indonesian acronym for Komite Percepatan dan Perluasan Pembangunan Ekonomi Indonesia, which is translated as the Committee on Economic Development Acceleration and Expansion of Indonesia 2011-2025. It was established under the Presidential Decree No. 32/2011, and the chairman of the committee is the President of Indonesia. The Secretariat of the Committee is run by the Coordinating Ministry of Economic Affairs (CMEA).

is underway. Against this background, the MP3EI reveals that it is not intended to replace the long-term and medium-term plans, but is meant to function as a complementary working document for those plans.

According to the MP3EI, implementation of the plan will include 8 main programs which consist of 22 main economic activities, and the implementation strategy will integrate 3 main elements which are presented as follows:

① Developing the regional economic potential in six Indonesia Economic Corridors
② Strengthening national connectivity locally and internationally
③ Strengthening human resource capacity and national science & technology to support the development of main programs in every economic corridor

☐ Industrial Development as the Key to Sustainable Growth

The Indonesian economy has performed in a good shape in the recent decade. It has grown annually by more than 6% in real terms during most of the years till 2012, while inflation rate has been kept low and fiscal balance has remained stable. Even in 2009, the year when global economy collapsed simultaneously in the wake of the financial crisis that broke out in USA, Indonesia achieved a 4.6% real GDP growth, which was an exceptionally positive record globally. This high record of growth has led to the increase of per capita income from $2,211 in 2008 to $3,592 in 2012 as shown in <Table 1-2-1>. Such an impressive performance of the Indonesian economy has already drawn much attention from the world media and research institutes, and many predicted the rise of Indonesia as the leading emerging market after the BRICs 4 of Brazil, Russia, India and China (World Finance, 2013; Mori, 2010; Thee Kian Wie, 2010).

However, despite this positive performance in macro-economy, the making of the MP3EI itself leads to the inference that the Indonesian government felt the necessity of complementation to the ongoing development plans, and there was a need to spur the development programs and speed up economic growth.[3] In the Preface of the MP3EI,

[3] It can be inferred that the recent global recession influenced especially by the financial crisis in European states had drawn an unusual economic environment that necessitated a contingency plan. However, the MP3EI is more than just a contingency plan, since it was designed as a long-term economic plan with a grand vision of the national economy.

Indonesia's President Yudhoyono stated that "our economic growth thus far have not yet reached advanced, inclusive and sustainable growth level" and emphasized the spirit of "Not business as usual" for the implementation of MP3EI. He stated that the Masterplan has two factors: acceleration and expansion.

Table 1-2-1 Current Economic Trends of Indonesia

	Unit	2008	2009	2010	2011	2012	2013 (forecast)
GDP(Current)	Billion US$	510.839	538.803	709.543	846.159	878.198	946.391
(Per Capita)	US Dollar	2,211	2,300	2,986	3,511	3,592	3,816
(Real Growth)	%	6.0	4.6	6.2	6.5	6.2	6.3
Population	Million	227.6	234.4	237.6	241.0	246.9	245.90
Consumer Price Increase	%	9.8	4.8	5.1	5.4	4.3	5.8
Unemployment	%	8.4	7.9	7.1	6.6	6.2	6.1
Exports	Billion US$	137.020	116.510	157.779	203.496	190.031	200
(Growth)	%	20.1	-15	35.4	29	-6.6	10.6
Imports	Billion US$	129.197	96.829	135.663	177.435	191.691	..
(Growth)	%	73.5	-25.1	40.1	30.8	8.0	..
Trade Balance	Billion US$	7.823	19.680	22.115	26.061	-1.659	..
Current Account	Billion US$	0.286	10.628	5.145	1.685	-24.183	-31.056
Foreign Exchange Reserves	Billion US$	51.6	66.1	96.2	110.1	112.8	105.2
Fiscal Balance	% of GDP	-0.1	-1.6	-0.6	-1.2	-2.2	-1.7
Exchange Rate	Rupiah/ Dollar	9,699	10,389	9,170	8,773	9,419	9,643

Source: IMF (2013), *International Financial Statistics Yearbook*
OECD (2012), *Economic Outlook: Indonesia,* Volume 2012 Issue 1
Economy Watch Database (http://www.economywatch.com/economic-statistics/country/Indonesia/)

Acceleration refers to the concept that the plan would speed up the progress of existing development projects, especially in boosting the value adding of primary economic sectors, increasing development of infrastructure and energy supply, as well as the development of human resources and science & technology. On the while, expansion refers to the concept that the positive effects of Indonesia's economic development should be felt at each and every region, and by all components of the community across the nation.

It is noteworthy that the problem identification and direction of the prescription of this research exactly correspond to the statement of abovementioned Preface. All the researchers who participated in this research shared the recognition that despite the promising development of the macro-economy of Indonesia in recent years, there exist urgent needs to diversify and upgrade the industrial structure to keep sustainable economic growth and to lead the results of economic growth to the poverty reduction in the society.

The concept of aforementioned "acceleration" is clearly mentioned in the following chapters of this research. In Chapter 2 written by specialists of the Asian Development Bank, the authors refer to the concerns on "avoiding a Middle Income Trap", a concept which refers to the cases of many developing countries that have not advanced beyond certain middle income level. Those countries could achieve initial economic growth mostly by virtue of their low-wage labors or commodity-based industries. However, as their economy grew, the increase of wages and appreciation of the local currencies led to the loss of their comparative advantages, resulting in the stalemate of economic growth.[4]

In Chapter 3, Manuel Albaladejo of UNIDO emphasizes the importance of manufacturing as the engine of sustainable growth, and raises the concern on the comparatively low performance of Indonesia's manufacturing sector. His analysis shows that during the period of 2000-10, the structure of manufactured exports of Indonesia has not moved towards the desirable industrial path: the share of resource-based exports has grown from 34% to 50%, while that of high-tech exports has decreased from 15% to less than 7%. The authors of ADB and UNIDO raise similar concerns on the issue of sustainable economic growth driven by the exports of commodity and resource-based industries.

Finally, the authors of KIET present more in detail how the task of "acceleration and expansion" of economic growth can be realized. Simply put, it is to diversify the products and

[4] The so-called "Dutch Disease" is frequently illustrated as the exemplary cases of this middle income trap, especially in the cases of commodity-dependent countries.

markets of Indonesian industries, realizing structural changes to upgrade the industrial capacity so that Indonesian industries could step up the ladder of industrial development towards higher value-added industries. It is said that Korea has relatively done this task well[5], and all the authors of KIET in this report have taken advantage of their experiences in the making of industrial policies in Korea. The KIET researchers have presented their diagnoses on industry-specific conditions of the four strategic industries including Automobiles, Shipbuilding, Electronics, and Textiles & Clothing, and put their policy suggestions on how Indonesia could develop these industries.

These industry-specific analysis and suggestions comprise Chapter 4 and 5, and it can be said that these parts are the most important in the respect that the ultimate acceleration and expansion of economic growth should be realized through industry-specific, field-oriented policy measures. This author as the project manager of this research has stressed that these industry-specific analysis parts would be especially invaluable components of the research as they could complement the missing parts of the MP3EI as well as existing development plans. However, it should be mentioned that as our mission was confined to proposing policy suggestions, all the texts posit that they remain as suggestions. Continuous research and partnership with Indonesian specialists would lead to the development of concrete action programs in the future.

1-3. Methodology of the Research

The most important concept for the approach of this research has been “partnership and joint research”. As mentioned previously, this research has been designed as an internationally multilateral consulting project. To complement the lack of field information of Korean specialists, KIET has organized the joint work of Indonesian specialists as well as international organizations. Joint workshops and field surveys across the two nations have been pursued as a component of this research. All the participants have joined the two workshops in Jakarta and Seoul, after which field surveys of the participants have followed.

[5] Professor Keun Lee (2010) of Seoul National University claims that continuous Capability Upgrading has been the essence of Korea's industrial development.

Empirical studies rather than theoretical analysis have been emphasized as the topics of concern are highly practical industrial development policy issues.

① Partnership for Knowledge Sharing

This project as a whole has been processed through the knowledge sharing between the experts of the two countries and two international organizations. The project manager of KIET has organized a team of highly experienced experts on the economic and industrial development issues, inviting specialists from UNIDO and ADB. The CMEA of Indonesia also organized a group of specialists corresponding to the topics of the research. Then, all these experts shared their knowledge and expertise through the joint workshops and correspondences.

For this publication itself, the team of KIET, ADB and UNIDO took charge of different topics and submitted their research papers. The KIET team has analyzed industry-specific issues along the lines of the four strategic industrial sectors, while UNIDO and ADB specialists have analyzed macroeconomic and overall industrial development issues. So, this research is a product of the partnership and joint work of the international intellectual community.

② Joint Workshops and Field Survey

For this research, two joint workshops have been held in Jakarta and Seoul. The first workshop was held in Jakarta on 3-4 September, 2012 and the second workshop was held in Seoul on 5-6 November, 2012. All the research team participated in these workshops, and some specialists from the two governments of Korea and Indonesia as well as academic and business societies also attended. However, as these events were intended to promote highly policy-oriented dialogues between the professionals, they were not open to public. Then, after closing two days of seminars, there followed field survey trips for several days. During the first workshop period, Korean experts travelled across major industrial sites in Indonesia and visited relevant authorities. These trips brought them vivid feelings and information on the local situation of Indonesian industries. After the second workshop in Seoul, the team of Indonesian experts travelled along the major industrial sites of Korea and visited relevant

authorities. These trips also brought them field information on the status of Korea's industrial development, which have added up their insights on their own industrial planning.

It should be mentioned that this research itself is a part of the broader cooperation projects between the two countries. While there are currently many cooperation issues ongoing and yet to be explored through the meetings of the Joint TF and the local Joint Taskforce Office in Jakarta, a parallel study of KIET including the infrastructure and regional development issues is also being carried on. For this parallel study, another Korean institute, the Korea Research Institute for Human Settlement (KRIHS), joined the research team, and they also participated in the whole itineraries of the two workshops.

③ Empirical Studies

This research has been pursued through empirical studies, avoiding intuitive judgment prior to the studies on the concrete local situation. As the mission of the research team is to draw policy recommendations for the industrial development of Indonesia, they have repeatedly borne in mind that this study should be based on the correct understanding of the local situation. They tried to collect as many information on the real situation and challenging issues of Indonesian industrial development. The KIET team tried to analyze the information against the experience of Korea's industrial development, as well as the global trends of industrial development and market situation. As they have found that the local situation of industries in Indonesia having many in common with the initial stage of industrial development in Korea, they tried to utilize the lessons from Korea's development experience. The research parts contributed to by the UNIDO and ADB specialists are also reflecting on their own field experiences in Indonesia and global sites.

1-4. Structure of the Research

This research is composed of six chapters in total, comprising the contributions by the KIET, ADB and UNIDO specialists. Except the Introduction, the main contents deals with four large topics, which are illustrated in <Table 1-4-1>.

The first topic, which is narrated in the second chapter, is the macroeconomic diagnosis of Indonesian economy. For this topic, a team of ADB specialists, of which the members are Edimon Ginting, Paulo R.M. Halili, M. Ehsan Khan, and Dante Canlas, collaborated together to produce the paper. The second topic, which corresponds to the third chapter, is the industrial structure and development issues of Indonesia. For this topic, Manuel Albaladejo of UNIDO has contributed his study.

The third topic deals with industry-specific analysis of the four strategic industries and policy recommendations, which have been taken up by the four KIET specialists. Among the four industries, Automobiles have been researched by Cheul Cho, Consumer electronics by Kyoung-Sook Lee, Shipbuilding by Sung-In Hong, and Textiles & Clothing by Hoon Park. As this third item occupied the largest volume of the publication, the editor divided it into two chapters. The earlier chapter analyzed Global Industry Trends and Issues together with the Current Status of Indonesian Industry and Challenges. The latter chapter focuses on the specific policy recommendations for Indonesian industries, taking advantage of the lessons from Korea's industrial development experiences. Finally, the fourth and last topic deals with industrial cooperation issues between Korea and Indonesia. For this item, Geun-Ju Jeong of KIET has contributed her study.

Table 1-4-1 Structure and Contents of the Research

<table>
<tr><td colspan="2">1. Introduction</td></tr>
<tr><td colspan="2">2. Macro-economic Trends and Issues (ADB)</td></tr>
<tr><td colspan="2">3. Industrial Structure and Development Issues (UNIDO)</td></tr>
<tr><td colspan="2">4. Industry-specific Analysis (KIET)</td></tr>
<tr><td>● Automobiles
● Consumer Electronics
● Shipbuilding
● Textile & Clothing</td><td>● World Industry Trends and Issues
● Current Status of Indonesian Industry and Challenges
● Korea's Industrial Development Experiences and Lessons
● Policy Recommendations</td></tr>
<tr><td colspan="2">5. Korea - Indonesia Industrial Cooperation (KIET)</td></tr>
</table>

It should also be mentioned that, even though their contributions are not apparently shown in this publication, the seminar presentations of Indonesian specialists and their views and ideas have been effectively adopted throughout the research. These presentations have been printed out as the proceedings of the two workshops, which have been already distributed.[6]

[6] The workshop proceeding are available through the KIET websites. The URLs are as follows:
http://eng.kiet.re.kr/kiet_eng/main.jsp?sub_num=215&state=view&idx=8253&ord=0 (2nd Workshop)
http://eng.kiet.re.kr/kiet_eng/main.jsp?sub_num=215&state=view&idx=8252&ord=0 (1st Workshop)

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Strategic Asia (2012), *Implementing Indonesia's Economic Masterplan (MP3EI): Challenges, Limitations, and Corridor Specific Differences*

Thee Kian Wie (2010), "Indonesia and the BRICs", *East Asia Forum*, December 12th, 2010 (http://www.eastasiaforum.org/2010/12/12/indonesia-and-the-brics)

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<Website>

Economy Watch Database (http://www.economywatch.com/economic-statistics/country/Indonesia/)

KP3EI Homepage, http://www.kp3ei.go.id/

Ⅱ. Transforming Indonesia and Avoiding a Middle-Income Trap: Economic Challenges and Policy Options

Edimon Ginting, Paulo R.M. Halili, M. Ehsan Khan, and Dante Canlas[7]

2-1. Recent Macroeconomic Performance

Indonesia's economic performance over the past few years has been remarkable. For the period 2007-2011, real GDP, on average, grew by close to 6% each year. Although economic growth weakened to 4.6% in 2009 from 6% in 2008 due to the shocks from the global financial crisis, it regained strength to expand by 6.2% and 6.5% in 2010 and 2011, respectively. If these recent annual growth rates can be maintained over the long term, real GDP can be expected to double approximately every decade, with significant strides in living standards.

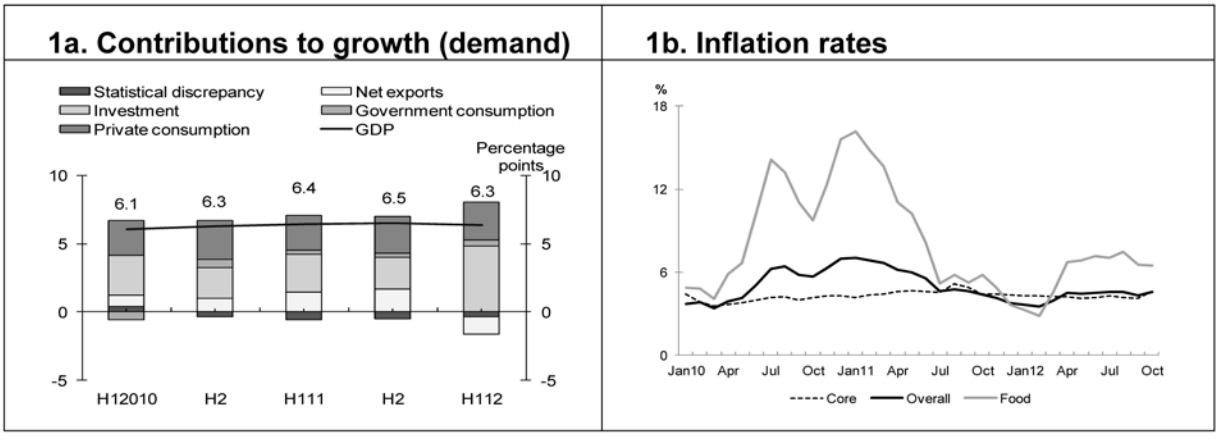
In 2012, exports of goods and services weakened due the weaker global economic environment. As consequence, net exports acted as a drag on GDP growth. However, economic growth remained strong estimated at 6.3%, supported by strong investment, continued robust private consumption and higher government spending (Figure 1.a). Data from the Investment Coordinating Board show that actual foreign direct investment (FDI) rose by about 30.3% relative to the year-earlier period. This welcome boost in investment was underpinned by improvements in the domestic investment climate and solid economic growth over recent years as well as an expansion in credit. Consumer spending remained robust, bolstered by relatively benign inflation, good harvests that supported farmers' incomes, and a firm labor market. Government consumption spending also accelerated, reflecting better execution of budgeted projects. While significant challenges remain,

[7] Eudmon Ginting, Paulo R.M. Halili, M. Ehsan Khan, and are senior staff of Asian Development Bank, and Dante Canlas is the professor at University of the Philippines

improvements in budget procedures and procurement capacity in ministries, as well as enhancements to monitoring and coordination have gradually lifted budget disbursement rates.

From the supply side, services and manufacturing made the biggest contributions to GDP growth. Continued rapid expansion of communications helped to underpin growth in services. Manufacturing growth eased only slightly, despite the weakening in exports. Agriculture and mining rebounded moderately.

Figure 2-1-1: Contribution to Economic Growth and Inflation Rate

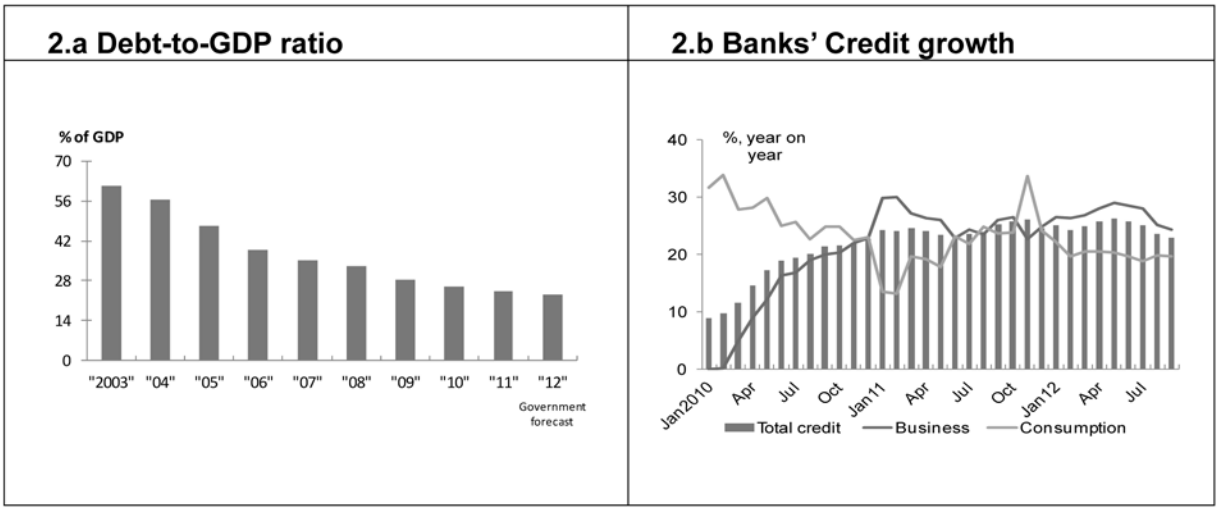


Sources: Asian Development Outlook database; CEIC Data Company

Inflation was more subdued than expected, rising gradually to 3.7% year on year in November (Figure 2-1-1.b). Inflationary expectations rose in the first quarter, reflecting plans by the government to increase administered fuel prices in April. However, the increase was put on hold when the Parliament decided that fuel prices could be raised only if Indonesian crude oil exceeded $120.80 over a 6-month period, which did not happen. With the postponement of fuel price increases, core inflation settled at 4.4% in November. Inflation at the end of the year is estimated at 4.5%.

Government maintained its sound fiscal stance with budget deficit estimated at 2.3% of GDP. While spending increased significantly, including for fuel and electricity subsidies, tax collection also increased faster than expected on the revenue side. Budget disbursement quickened compared with the performance of the previous 2 years. Though fiscal deficit 2012 is higher than in 2011, the ratio of national government debt to GDP is projected to decline further to 24%, maintaining the downward trend of the past eleven years (Figure 2-1-2.a).

Figure 2-1-2: Government Debt and Credit Growth



Sources: Asian Development Outlook database; CEIC Data Company

The banking sector remains sound with capital adequacy ratio of 17.3% and non-performing loan of 2.1% at end September 2012. Bank credit continued to grow at a rapid pace of about 23%, with credit for investment expanding faster at around 30% (Figure 2-1-2.b). In light of the weakness in exports and rise in imports, the current account deficit in 2012 is estimated at 2.1% of GDP. Reflecting increasing current account deficit, the rupiah depreciated by 6% for the year.

After Fitch in December 2011, Moody's upgraded Indonesia sovereign credit ratings to investment grade in January 2012. Key consideration for the upgrade include the country's resilience during large external shocks, strong financial sector, and the presence of policy buffers and tools to address potential financial vulnerabilities.

Robust economic growth generated more and better jobs. About 1.5 million new jobs were created in the 12 months through February 2012, exceeding the number of new entrants to the labor force (1.0 million) during that period. The quality of employment improved as 2.4 million people moved out of the informal sector and about 4 million found employment in the formal sector. Most jobs created were in trade, finance, construction, and manufacturing.

Economic growth in 2013 is expected to improve slightly in line with better growth performance of Indonesia's key trading partners. The contribution of exports is projected to turn positive, but investment will remains as the biggest driver of growth. The improved investment climate, lower interest rates, increases in public capital outlays, and upgrades in sovereign ratings underpin prospects for investment. The new land law eases a serious

constraint on infrastructure investment and the authorities have also moved to simplify regulations at the local government level. In regards to investment from abroad, Indonesia moved up to fourth position in the global ranking of likely destinations for FDI in the 2012 survey of major international corporations by the United Nations Conference on Trade and Development. On the fiscal front, the Parliament has approved a budget with a deficit target of 1.7% of GDP, another lift in spending on infrastructure by 21%.

2-2. Economic Challenges

Despite the noteworthy macroeconomic performance of the Indonesian economy in recent years, several pressing challenges remain. The main development challenge is to accelerate the economic transformation of the economy to improve overall productivity. Productivity improvement has contributed to economic growth in the past decade, but Indonesia needs to improve its productivity by 50-60% to achieve its medium-term growth target of 7-8% (McKinsey, 2012). This will require a declining share of employment in the agriculture sector while increasing the share of non-agriculture, namely, industry and services. This is the key to creating high-wage and high-skill jobs across time. On the supply side, the transformation hinges on an approach to production in all sectors of the economy that emphasizes increasing productivity which production techniques that heighten their competitiveness.

On the demand side, households must endeavor to be productive in the workplace, and be motivated to save and invest facilitated by a more efficient financial system. Macroeconomic policies must ensure price stability, sound fiscal position and external balance-of-payments position, an environment that provides a stable and predictable environment for the private sector.

In the near-term, key challenges include (i) maintaining economic resilience in current global economic slowdown, (ii) addressing lagging infrastructure, and (iii) starting to deal with increasing income inequality. Further down the line, as economic development advances further, Indonesia, like many other developing countries, will face the middle-income trap.

2-2-1. Maintaining Economic Resilience

Key downside risks to Indonesia near-term economic outlook are further deterioration of the export performance and capital outflows. Protracted global economic recovery in Indonesia's major export markets would widen the current account deficit further and dampen growth. In addition, as experience demonstrated, Indonesian economy is susceptible to financial market volatility - about two-thirds of equities and one-third of sovereign bonds are foreign held. Deficits in the budget and current account reinforce the importance of maintaining capital inflows.

To mitigate these risks, the authorities have widened fiscal deficits targets to accommodate increased capital spending, added the flexibility to raise spending and switch budget priorities in case of an economic emergency, and put together a $5 billion standby loan from development partners. To stabilize volatility in the bond market the government established a program under which it can draw on accumulated budget surpluses and funds from state-owned enterprises to steady the market. For its part Bank Indonesia has taken steps over the past year to reduce short-term and speculative capital inflows and to mitigate the risks of sudden outflows.

2-2-2. Accelerating Infrastructure Development

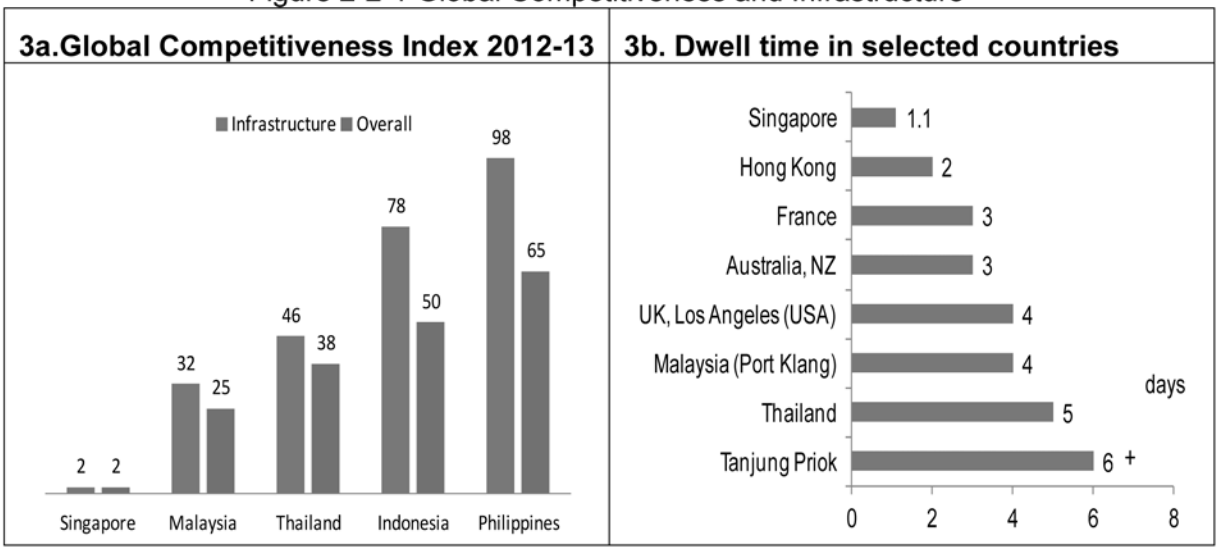
As noted above, Indonesia economic growth has improved in the last five years and proven to be resilience to the external shocks. Nonetheless, economic growth is still significantly below the country's growth potential. For 2014–2016, the International Monetary Fund estimates a baseline potential growth rate of 7.1%, which would increase to 7.9% if infrastructure development and economic reforms were accelerated. An Asian Development Bank (ADB) study also highlights inadequacies in infrastructure as a critical constraint to economic growth.[8] Indonesia's overall ranking in the Global Competitiveness Index is at 50 out of 144 countries.[9] However, the country ranks only 78 out of 144 on quality of infrastructure, far below its overall ranking, implying that infrastructure is a drag on the country's competitiveness (Figure 2-2-1.a). The impact of lagging infrastructure appears in a

[8] H. Hill, M. E. Khan, and, J. Zhuong, eds. *Diagnosing the Indonesian Economy: Toward Inclusive and Green Growth.* London: Asian Development Bank / Anthem Press.

[9] World Economic Forum. 2012. Global Competitiveness Report, 2012–2013. Geneva.

number of forms. Indonesia receives the worst ranking of 105 on port quality. Dwelling time of ships in Jakarta main port of Tanjun Priok is exceeding 6 days (Figure 3.b). Congested ports and underdeveloped interisland transport have led to expensive domestic shipping costs. Congested and underdeveloped international ports limit the efficient integration of Indonesia's manufacturing sector into international production networks. Deteriorating roads in the provinces and districts increase domestic transport and logistics costs.

Figure 2-2-1 Global Competitiveness and Infrastructure

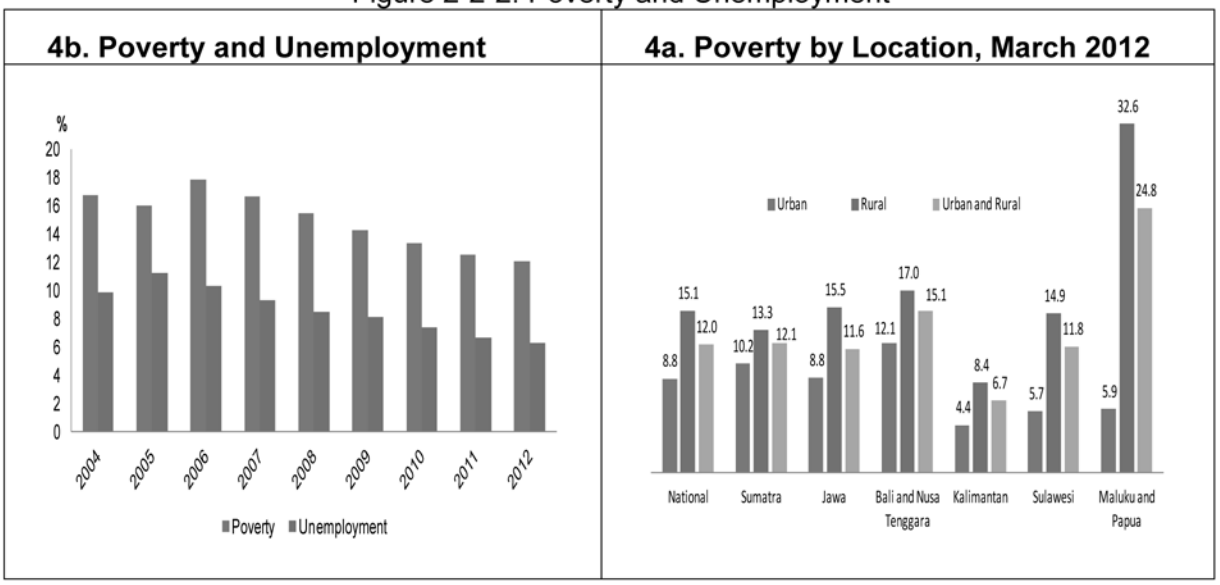


Source: World Economic Forum (2012); SMEC (2012)

2-2-3. Reducing Poverty and Unemployment

In spite of Indonesia's admirable macroeconomic performance, the proportion of Indonesians considered poor is still high. To be sure, the poverty incidence rate in Indonesia based on official statistics has been declining. For instance in 2007, the proportion of Indonesians considered poor was 16.6%. In 2012, this declined to 12.0% (Figure 4.a). However, significant challenges remain in reducing poverty incidence further. At the current poverty level, some 30 million Indonesians are still considered poor.

Figure 2-2-2. Poverty and Unemployment



Sources: BPS

Although the open unemployment rate had declined to about 6.6%, in absolute number, some 7.7 million Indonesians in the labor force were jobless. Many of the unemployed belonged to the young age groups (15-24 years) in the labor force. About 62% of the employed labor force (about 68.2 million people) still works in the informal sector, where wages and job security are low. Many Indonesians remain vulnerable to economic shocks as more than 60 million people still live just above the poverty line and are at high risk of falling back into poverty. The progress in reducing poverty is mixed if in the rural and in the eastern part of Indonesia. The national rural poverty rate of 15.6% is still much higher than the national urban poverty rate of 9.1%. Poverty rates in some provinces in eastern Indonesia are much higher than elsewhere in the country—for example, 25.3% in Maluku and Papua (Figure 2-2-2.b).. Furthermore, the distribution of income in Indonesia has worsened consistently. The Gini coefficient index has increased from 0.29 in 1999 to 0.41 in 2011.

2-2-4. Avoiding a Middle-Income Trap

The concept of a middle-income trap has been getting a lot of attention in a number of recent discourses. The inquiry is motivated by a desire to understand why some countries are more productive than others and become models of successful industrialization, while others stagnate or even decline in terms of level and growth rate of real per capita income.

Broadly put, countries whose income growth slows down profoundly after reaching middle-income status are considered caught or at risk of getting mired in a middle-income trap (see, e.g., Canlas 2011).

In many cases, in the course of its economic development, a country sees a diminution in the share to national output of agriculture, while the share of non-agriculture, namely, industry and services, rises. Industry's rise rest on the growth of manufacturing, which starts from the production of labor-intensive light manufactured goods. Herein lies the country's comparative advantage, utilizing low-cost labor that is in relative abundance. Eventually, however, labor market tightens and real wages increase. When the economy loses its comparative advantage to other low-income economies, it is no longer able to compete against low income, low wage economies in light manufactured goods. Meanwhile, it is not yet ready to compete against advanced economies in high skill innovations and higher-value production. The result: the country stagnates and gets caught in a middle-income trap (see, e.g., ADB 2011; Zhuang, Vandenberg, and Huang, 2012.).

For some Latin American countries, they stumbled and fell into low-growth traps can be traced to inconsistent fiscal, monetary, and exchange-rate policies. Chronic budget deficits resulted in inflationary monetary policy. Such policies were pursued amid fixed exchange rates or tightly managed floats. The outcomes were balance-of –payments or liquidity crises and collapsing exchange rates, ushering in recessions.

To operationalize the concept of middle-income trap, Felipe (2012) in his recent paper attempts to provide a working definition. First, he defines the two types of middle income economy; first Lower Middle –Income with per capita income in purchasing power parity (PPP) of $2000-$7,249 and Upper Middle-Income with per capita income of $7,249-$11,749. Second, he defines the thresholds for a country considered to be caught in the lower middle-income trap if it stays in that group for at least 28 years, and in the upper middle-income trap if it stays in that group for at least 14 years. In determining the thresholds, Felipe calculates the median number of years that countries in either the lower middle-income or in the upper middle-income groups, before breaching the next income group. Using the above criteria, Felipe found that 35 of the 52 middle-income countries are considered caught in the middle-income trap (Tables 2-2-1 and 2-2-2).

Table 2-2-1: Economies in the Lower Middle-Income Trap in 2010

Economy	2010 GDP per Capita (1990 PPP $)	Years as LM until 2010	Average Growth (%) 2000-2010	Years to Reach $7,250*
Philippines	3,054	34	2.5	35
Sri Lanka	5,459	28	4.3	7
Albania	4,392	37	4.8	11
Romania	4,507	49	4.1	12
Bolivia	3,065	45	1.8	49
Brazil	6,737	53	2.0	4
Colombia	6,542	61	2.6	5
Dominican Republic	4,802	38	2.8	15
Ecuador	4,010	58	2.2	27
El Salvador	2,818	47	0.4	251
Guatemala	4,381	60	1.1	47
Jamaica	3,484	56	-0.3	-
Panama	7,146	56	2.4	1
Paraguay	3,510	38	1.5	48
Peru	5,733	61	4.2	6
Algeria	3,552	42	2.2	34
Egypt	3,936	31	3.0	21
Iran	6,789	52	3.4	2
Jordan	5,752	55	3.5	7
Lebanon	5,061	58	4.1	10
Libya	2,924	43	2.4	39
Morocco	3,672	34	3.3	21
Tunisia	6,389	39	3.5	4
Yemen, Rep. of	2,852	35	0.9	109
Botswana	4,858	28	1.7	24
Congo, Rep. of	2,391	33	1.8	63
Gabon	3,858	56	0.0	-
Namibia	4,655	61	2.4	19
South Africa	4,725	61	2.0	23
Swaziland	3,270	41	2.2	37

* Number of years to reach $7,250 = ln(7250/gdp2010) / ln(1 + avegr), where avegr is the average growth rate of income per capita during 2000-2010.

GDP = gross domestic product, LM = lower middle-income, PPP = purchasing power parity.

Source: Felipe (2012).

Table 2-2-2 Economies in the Upper Middle-Income Trap in 2010

Economy	2010 GDP per Capita (1990 PPP $)	Years as LM	Years as UM until 2010	Average Growth (%) 2000-2010	Years to Reach $11,750*
Malaysia	10,567	27	15	2.6	5
Uruguay	10,934	112	15	3.3	3
Venezuela	9,662	23	60	1.4	15
Saudi Arabia	8,369	20	32	0.9	37
Syria	8,717	46	15	1.7	18

Source: Felipe (2012).

Notes: * Number of years to reach $11,750 = ln(11750/gdp2010) / ln(1 + avegr), where avegr is the average growth rate of income per capita during 2000-2010; GDP = gross domestic product, LM = lower middle-income, PPP = purchasing power parity, UM = upper middle-income.

The remaining 17 middle-income economies are not in the middle-income trap (Tables 3 and 4). Based on Felipe's threshold, Indonesia is currently a lower middle-income country and is not yet caught in the middle- income trap. However, Indonesia has been in the Lower Middle-Income for 25 years, in part due to many years lost in the aftermath of the Asian Financial Crisis. Using the 28 years threshold, Indonesia has only 3 years from 2010 to avoid the lower middle-income trap and its per capita GDP needs to grow by an average of 14.8% annually to reach upper middle-income status by 2013.

Table 2-2-3 Lower Middle-Income Economies Not in the Trap in 2010

Economy	2010 GDP per Capita (1990 PPP $)	Years in LM until 2010	Years before Falling into the Lower Middle-Income Trap*	Average Growth (%) 2000-2010	Average GDP per Capita Growth to Reach $7,250**
Cambodia	2,529	6	22	8.2	4.9
India	3,407	9	19	6.1	4.1
Indonesia	4,790	25	3	3.9	14.8
Myanmar	3.301	7	21	9.0	3.8
Pakistan	2.344	6	22	2.6	5.3
Viet Nam	3,262	9	19	6.1	4.3
Honduras	2,247	11	17	1.6	7.1
Mozambique	2,362	4	24	5.8	4.8

Source: Felipe (2012).

Notes: *Calculated as (28 years – number of years in LM until 2010).

**Average growth needed to reach $7,250 from the income level in 2010 over the years before falling into the lower middle-income trap.

GDP = gross domestic product, LM = lower middle-income, PPP = purchasing power parity.

Table 2-2-4: Upper Middle-Income Economies Not in the Trap in 2010

Economy	2010 GDP per Capita (1990 PPP $)	Years in LM	Years in UM until 2010	Years before Falling into the Upper Middle-Income Trap*	Average Growth (%) 2000-2010	Average GDP per Capita Growth to Reach $11,750**
China	8,019	17	2	12	8.9	3.2
Thailand	9,143	28	7	7	3.6	3.6
Bulgaria	8,497	53	5	9	4.7	3.7
Hungary	9,000	51	10	4	2.4	6.9
Poland	10,731	50	11	3	3.9	3.1
Turkey	8,123	51	6	8	2.3	4.7
Costa Rica	8,207	54	5	9	2.9	4.1
Mexico	7,763	53	8	6	0.7	7.2
Oman	8,202	33	10	4	1.4	9.4

Source: Felipe (2012).
Notes; *Calculated as (14 years – number of years in UM until 2010).
**Average growth needed to reach $11,750 from the income level in 2010 over the years before falling into the upper middle-income trap.
GDP = gross domestic product, LM = lower middle-income, PPP = purchasing power parity, UM = upper middle-income.

In order to escape the lower-middle income trap, Indonesia faces the formidable challenge of accelerating its GDP growth rate going forward. In this regard, the main tasks are, one, avoiding economic downturns; and two, achieving increasing returns from investments. The next section discusses macroeconomic policies and policies for long-run growth that are crucial.

2-3. Economic Policies

This section describes economic policies that stand a good chance of putting Indonesia on a high growth path and transforming the economy into a more productive and industrializing economy in the next decade or two. The main tasks involve raising productivity, eliminating poverty, and raising the living standards of all citizens.

To raise productivity, rapid accumulation of capital, broadly defined, has to take place. But while capital accumulation is largely the lookout of the private sector, the government has an important role to play in enhancing and accelerating the process. Good governance must,

therefore, accompany, market reliance. Households and enterprises that consume, save and invest require a stable and predictable environment for decision-making. In this regard, macroeconomic policies must be designed for stability while providing a solid base for long-run growth.

2-3-1. Macroeconomic Policies

Good macroeconomic management has been key story in the country's economic recovery from the Asian Financial Crisis (AFC) and the resilience from recent global economic crisis and economic slowdown. The government adopted fiscal consolidation in the aftermath of the AFC and the policy reduced the country's debt to GDP ratio from about 100% in 1999 to 24% in 2012. Since the introduction of the inflation targeting framework in July 2005, inflation in Indonesia has declined significantly. Available studies in Indonesia suggest that controlling inflation has played key role in reducing poverty incidence (World Bank, 2006, 2011).

While the fiscal consolidation was necessary in the aftermath of the AFC, it also produced significant underspending in the country's infrastructure and social programs. Infrastructure is regarded a key bottleneck to accelerate economic growth, and additional spending will be necessary to implement the government's more comprehensive and consolidated poverty alleviation programs. Therefore, significant efforts are needed to create fiscal space to augment spending on infrastructure and poverty alleviation.10 Additional fiscal space can be generated from a number of areas. The government targets continued reduction of the government debt to GDP. This policy, together with continued improvement of economic performance and Indonesia's sovereign rating, will lead to a significant reduction of interest payments. Significant fiscal space can be generated by further reducing untargeted fuel subsidies, which the government has considered through a number of measures for the future. Spending on fuel subsidies has exceeded capital spending since 2010. The fuel subsidy is highly regressive. The richest 10% of household consume 40% of the total subsidized gasoline, and the top half of households use almost 84% of the total subsidized gasoline.

[10] Fiscal space is defined for this chapter as total expenditure minus all compulsory spending such as the public servant salary bill, transfer to the regions, interest payments, and subsidies. Another definition of fiscal space is the room in the budget to fund priority expenditure without undermining fiscal sustainability.

On monetary policy, it is widely accepted that monetary policy is most effective when it is focused on maintaining price stability. Keeping the inflation rate low enables the price system to direct resources to their most valued uses, thereby raising productivity. Since the introduction of the inflation targeting framework in July 2005, Bank Indonesia's primary objective has been to achieve its inflation target. On average, inflation in Indonesia has declined significantly since 2005, but with this high volatility, inflation in Indonesia on average tends to be higher than in other countries in the region. Empirical evidence has suggested a negative relationship between the inflation level and its volatility with GDP growth (Judson and Orphanides 1999). One important channel is through a higher cost of capital. Goyal and Ruiz-Arranz (2009) found that the government's domestic and international borrowing costs have been higher than costs of comparable countries largely due to the higher rate of inflation in Indonesia. The government's domestic and international borrowing costs are often used as benchmarks for the cost of private sector lending. Therefore, reducing inflation further is a key for attracting the significant amount of private investment needed to support higher growth.

While a significant part of inflationary pressures is temporary and originates from the supply side (mostly food price inflation) and administrative price adjustment, frequent and large deviations of inflation from the stated target could reduce the credibility of monetary policy. Thus, Bank Indonesia and the government have implemented a two-tier strategy for dealing with inflation. First, Bank Indonesia generally uses monetary policy when inflationary pressures persist. Second, to deal with temporary food inflation originating from the supply side, the government sets up a national team involving Bank Indonesia and several line ministries, headed by the Coordinating Ministry of Economic Affairs (see Ginting and Aji 2012).

Under the flexible exchange rate policy regime, rupiah exchange rate policy has been mostly consistent with the choice of fiscal and monetary policies. Bank Indonesia generally let the exchange rate moves in line with macroeconomic fundamentals. But it will intervene during extreme market volatility because the foreign exchange market is still relatively shallow.

Another major development objective is full employment, but its pursuit should not trigger inflation. To the extent possible, employers and employees should be left alone to negotiate and determine wage and employment contracts. A wage and employment contract reached

privately should not trigger an intervention from the government. The government, however, can still play a profound role in raising labor productivity.

On the labor-supply side, it may engage in the provision of education and training programs that equip workers with employable skills. On the demand side, it can regulate industries if some incumbent firms therein are able to exercise monopsony powers in the labor market.

Among the unemployed, focus should be concentrated on assisting young workers, those belonging to age cohorts 15-19 and 20-24 years whose unemployment rates tend to be the highest in Indonesia. The importance of addressing this problem cannot be overstated. Long unemployment spells among young workers result in foregone human capital. With low human capital embodied in them, they find it difficult to generate high-skill jobs. As a result, being unemployed today may mean being unemployed tomorrow.

In this connection, in addition to skill-acquisition programs targeted at young workers, a comprehensive review of labor-market policies covering minimum wage legislation and employment protection must be undertaken. In so far as these policies prevent firms, especially those in non-agriculture, from hiring young workers, they must be carefully reviewed and adjusted.

2-3-2. Investing in Human Capital

Human capital investments, particularly education and training, increase the efficiency units that individuals bring to the marketplace (see Becker 1964). In several studies that try to account for differences in earnings of individuals, education and training generally stand out as a major contributory factor to high earnings (see Mincer 1962).

As Becker has articulated, human capital accumulation is an investment in which costs are incurred in the present period while the returns come from a stream of earnings in the future. Costs are both direct and indirect, the latter referring to the earnings foregone if a person, for instance, decides to go to school instead of joining the labor force. Estimates of rates of returns to education generally show that education is a worthwhile investment (see, for instance, Psacharopoulos 1981).

In a growth context, human capital, combined with physical capital, help overcome the natural tendency for diminishing marginal productivity from either labor or capital. The new endogenous growth theory, for instance, stresses that human and physical capital, working

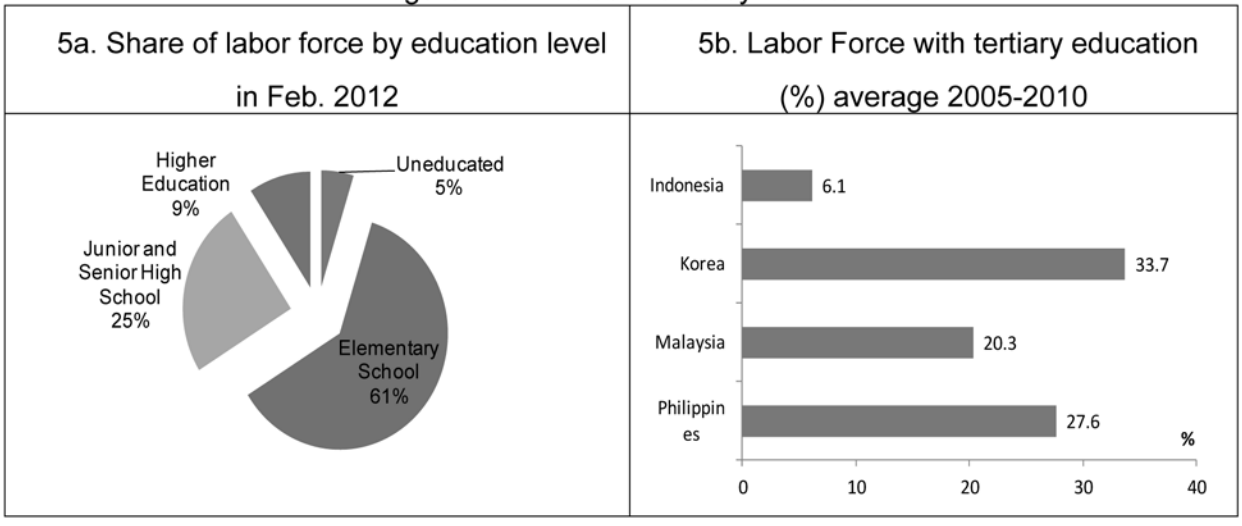
in tandem, results in increasing returns (see Lucas 1988). One channel through which education leads to sustained growth in the long run involves the technological progress that comes from building a stock of educated labor, including scientific and technical manpower that can be relied on to produce knowledge and advanced technologies (see Romer 1986).

Technological progress renders lifelong education a must. Some skills are eroded by technological progress. And so people must invest in acquiring new skills. Training and retraining are indicated as a matter of course. It happens as industrial transformation proceeds. Workers released from agriculture do not necessarily possess, for example, the industrial discipline that non-agriculture requires. Retraining is essential in this context.

Government has an important role to play in education and other forms of human capital investment. Education generally creates third-party spillover benefits or external economies for which the individual investing in education is not remunerated. Since people tend to invest only up to the returns that they can capture privately, underinvestment in education is likely. To prevent the under-investment, government steps in through tax-and-subsidy schemes.

Empirical studies that try to explain why some countries are more productive than others attest to the important role that education plays. For example, Barro (1991) finds that the growth rate of real per capita income is positively related to some lagged school enrollment rates. Investment in education also results in smaller family sizes as parents opt for fewer children but of higher quality. Growth thus persists across generations in countries that have substantially invested in education.

Figure 2-3-1: Labor Force by Education



Source: BPS, Doing Business 2013

Using an endogenous growth model, Benhabib and Spiegel (1994) estimated the contribution of education to the growth of real per capita income. The authors modeled education as the major determinant of total factor productivity (TFP). Education is a major force behind innovation as well as in speeding up technological adoption among countries that are starting with a relatively low technological base. In this formulation, education significantly and positively affects the growth of real per capita income.

The Indonesian government has had a long-standing presence in the provision of education at various levels. One key challenge for future growth is the quality of Indonesia's labour force. Currently, majority of labor force receive less than elementary school (Figure 5a). Facing with this challenge, in the last five years, the government has put education much higher in its priority. The constitution now has mandated the government to allocate 25% its budget for education. Chatani (2012) recently documented the growth of education stocks in Indonesia. He reports substantial improvements, beginning with near universal enrolment rates in primary education. In addition the share of labor with at least secondary education has significantly increased between 2004 and 2010. Meanwhile, the proportion of labor with tertiary education has also improved, but more rapid progress is needed as Indonesia trails other middle-income economies, such as, Malaysia, and the Philippines in the Association of Southeast Asian Nations (ASEAN) region (Figure 2-3-1.b).

In a growth context, public policy for higher education is crucial and in this sector, the government's role needs to be well defined. Higher education is where advanced research is being undertaken, which underpins accumulation of technological capital. Without government subsidies, R&D is under-produced, thereby hampering economic growth over the long run.

Indonesia is committed to raising the quality of basic education, both primary and secondary, and is already considering instituting a 12-year compulsory education from the current nine years. And to address the needs of industries for skilled workers, the government is expanding vocational and technical education. Furthermore, in response to the need for scientific and technical manpower, in line with the industrial transformation that is envisioned, further support to tertiary education is also being considered.

2-3-3. Technological Capital Investment and Product Varieties Expansion

Total factor productivity (TFP) is generally recognized as a major source of long-run growth; it is closely associated with technological progress, which largely emanates from investments in R&D. Though patents enable investors in R&D to appropriate the returns from their investments, there are still some spillover benefits from R&D that are not remunerated. It's a case whereby some advanced knowledge, once provided to one firm, cannot be withheld from other firms. Government is thus well advised to support R&D. It is also R&D that gives rise to new product varieties on which modern economic growth rests.

A way of viewing technological progress is the production of intermediate goods that come from knowledge creation.[11] This occurs in all major sectors of the economy including agriculture. For example, modern agriculture emerges from the introduction of high yielding seed varieties for crops like rice and corn, as well as fingerlings in aquaculture. The introduction of high-yielding seeds and fingerlings significantly raises productivity, enabling many rural agricultural workers to earn way above the income derived from subsistence agriculture. In non-agriculture, the invention of microchips and computers with supercomputing abilities that have transformed both industry and services is widely observed. It has led to the introduction of new goods that propel growth and continuing improvements in living standards.

The upfront cost of R&D is huge and middle-income economies may find it prohibitive to undertake. However technology transfer is possible, and countries just starting with their industrialization efforts can facilitate such transfer through a number of channels. For example, liberalization of foreign direct investments (FDIs) is helpful, given that FDIs carry with them modern technologies and advanced managerial techniques. But this requires strengthening the administrative, legal and judicial framework for licensing agreements and protection of intellectual property rights.

Over time, as the country progresses in its industrialization drive, resources are allocated in increasing amounts to R&D and knowledge production. In view of the increasing returns from knowledge spillovers, government subsidies may be in order, since those who invest in R&D are not compensated for the benefits that spill over to third parties.

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[11] Stokey (1988), for instance, has formally considered the introduction of new and better goods as the source of long-run growth and development in a model with spillover effects from knowledge creation and where production involves learning-by-doing.

In many middle-income economies today, the introduction of intermediate goods that leads to new goods of higher quality is occurring through international subcontracting and outsourcing. Many middle-income economies, for instance, host the manufacture of intermediate goods that are re-exported to developed economies. This is well observed, for example, in the manufacture of microchips and semiconductors. It is evident that much of the growth in foreign trade in the past few years has come from trade in intermediate products, such as, spare parts and components that R&D gives rise to.

Regarding trade policy, efforts to protect some industry subsectors like manufacturing crowds out of resources the knowledge-production subsector, which impedes output growth in so far as increasing returns are thwarted (see, e.g., Grossman and Helpman 1990). It must be highlighted that one important aspect of knowledge production and technological progress is price competitiveness. To derive reasonably large returns from successful R&D, market access and exports have to expand. A open trade policy is thus advisable if the aim is to capture increasing returns from knowledge production.

Indonesia today is a small open economy that trades with the rest of the world through trade in commodities, securities and national currencies. It is, for one, an active member of the World Trade Organization (WTO) and of the ASEAN Free Trade Area anchored on Comprehensive Effective Preferential Tariff (AFTA-CEPT). Such openness to international trade must not falter in order to open up further opportunities to acquire intermediate goods and expand product varieties that support productivity gains and long-run growth of per capita income.

2-3-4. Investing in Infrastructures

Government spending on infrastructures supports private production. Transport and telecommunication facilities, for instance, bring about physical integration. In addition, the substitution of electric for mechanical power generally results in efficiency gains in a variety of production processes.

Infrastructures link producers, sub-contractors, suppliers of raw materials, traders, and consumers. Productivity rises as a matter of course. In addition, people are able to access social facilities like schools and hospitals, given reliable and adequate infrastructures, with corresponding improvements in living standards. Cities emerge with comparative advantage

in a variety of production and consumption activities, thereby permitting the realization of scale economies.

Suleman and Iqbal (2012) have underscored the importance of infrastructure development for sustained growth and poverty reduction in Indonesia. Catch-up investments are indicated, for example, in transport, especially roads, railways, seaports, and airports. In addition, electric power supply calls for additional capacities with heightened reliability. Meanwhile, telecommunication services should aim for broader coverage and affordable rates.

Alleviating the country's multidimensional poverty will require not only accelerated economic growth but also a more inclusive growth process that provides rural areas and disadvantaged regions with greater economic opportunity and access to social services. Improving and developing infrastructure to improve the country's domestic and international connectivity is key to reducing poverty incidence by (i) connecting rural areas with regional growth poles, thereby widening access to markets and services; (ii) connecting the poorer eastern parts of Indonesia with markets in western areas through more efficient interisland transport systems; and (iii) improving international connectivity to boost the competitiveness of the country's productive sector. Combined, connectivity efforts are expected to have a key facilitating role in increasing employment, reducing the size of the labor force employed in the informal sector, increasing access to and delivery of services, and thereby enhancing economic productivity and social well-being, and reducing the overall poverty incidence.

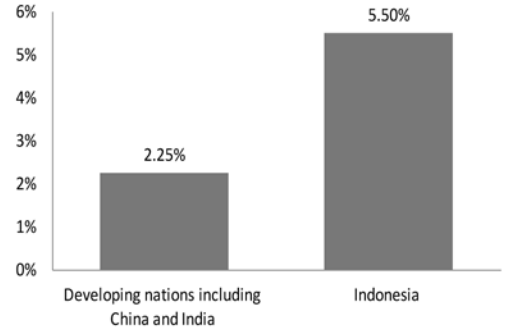
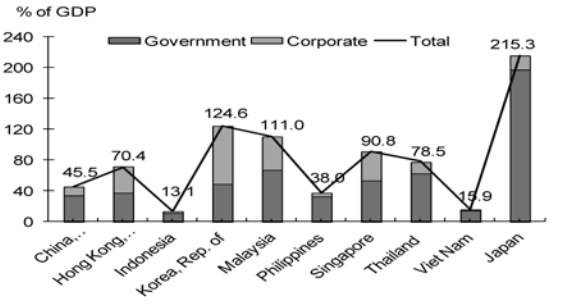
The huge costs of infrastructure financing and limited budgetary resources of government indicate a major role for public-private sector partnership. To the extent pricing of services from infrastructure facilities and exclusion of clients unwilling to pay the fee-for-service are feasible, private sector participation is possible.

2-3-5. Developing More Efficient and Deeper Financial Market

Productivity improvement will require large investment to support capital formation, human resource development, and infrastructure. The country needs to further develop its financial market to finance the above development needs more efficiently. Financial market has strengthened since the AFC and credit growth have expanded rapidly in the last seven years. However, the financial market, which is dominated by the banking sector, is relatively shallow. Banking loan to GDP ratio is still around 32% in 2012, much lower than lower than 100% in Viet Nam. In addition, with net interest margin close to 6%, the banking sector is

also less efficient than in other emerging market (Figure 6a). At the same time, the bond market is also still relatively underdeveloped, with market capitalization of around 13% of GDP, much lower than in Thailand and Malaysia with market capitalization of 65% and 99% of GDP, respectively (Figure 2-3-2).

Figure 2-3-2: Interest Margin and Size of Bond Market

Net interest margin charged by commercial banks (in %)	Size and composition of LCY Bond Markets in Q3 2012 (in % GDP)
	
Source: PwC (2012)	Source: ADB's Asia Bond Monitor Nov. 2012

There is further need to consolidate the banking sector and make them more completive. At the same time, further reforms are needed to make the lending environment more efficient with better credit information system, default resolution, and better land titling system. The development of the bond market is key for infrastructure development as banking financing is still limited to loan with short to medium term maturity. In addition, development of corporate bond market will provide competition for the banking sector financing, which will facilitate an overall efficiency improvement of the financial system.

2-3-6. Instituting Good Governance

Market outcomes at times are not adequate to meet the total needs of society. This happens when, for instance, spillover effects to third parties, either in the form of positive or negative externalities, are involved. Market failures may result with associated reduction in human welfare. Collective actions are thus needed to correct the limits of market outcomes. Frequently, the government finds it has to intervene and provide the needed market correction, resulting in the provision of public goods.

Moreover, since all exchanges are governed by contracts, whether explicit or implicit, the government sets up an administrative, legal and judicial system to ensure contractual performance and to adjudicate if any contractual dispute arises. This is often referred to as part of social capital, which includes the degree of trust placed on a variety of economic and business transactions.

Likewise, opportunistic behavior in market transactions does occur. So government commits to fight corruption and regulates if competition is impaired by the presence of only a limited number of firms in some industries. If the government fails to exercise its mandated roles, productivity suffers, with a concomitant decline in living standards.

Institutions and government policy interventions thus emerge in response to the need for good governance. Evidence exists that institutions and government policies matter for long-run growth, part of the “deeper” determinants of growth. Hall and Jones (1999), for example, found that these social infrastructures account significantly for the large differences in output per worker in a large cross section of countries. In the case of Indonesia, selected areas of governance that need attention are discussed below.

① Decentralization and Devolution

It is well recognized that government has an important role to play in a market-oriented economy. But which level of government, local or national, should deliver mandated public goods? The principle of comparative advantage is useful in deciding the proper division of labor between the national and local governments. The level of government that is more efficient in the delivery of some public goods should be in charge of that particular public good. By this rule, the economy gets more public goods. This also opens up the possibility of innovations in the delivery of local public goods.

Local governments (LGs), for instance, are more knowledgeable than the national government about the needs and concerns of their constituents by reason of proximity. Hence, they are better positioned to respond to those concerns. This consideration necessarily turns on fiscal issues like taxing powers that LGs may exercise and intergovernmental system of income transfers to support devolved activities.

But while the delivery of many public goods may be assigned to LGs, the national government sets national standards, including safety, to make sure that social objectives are not compromised. Cutting corners is avoided. Likewise, the national government demands

accountability in the use of funds that have been transferred to LGs. While important progress has been made implementing fiscal decentralization, several administrative and fiscal constraints hamper further progress (Niazi, 2012). The quality of road at districts level is now much worse than those at provincial and national level. The public expenditure review of the road sector by the World Bank finds that 24% of provincial roads and 41% of district roads are in bad or poor condition.[12] The performance is better for national roads, where only 12% are in bad or poor condition. Therefore, financing mechanism for road maintenance and capacity building sub-provincial levels need to improve for better delivery of local public goods.

② Protecting the Environment and Conserving Natural Resources

Indonesians value clean air, water, and in the overall a “clean and green” environment. In contrast, polluted air and water lower productivity of people and reduce their standards of living. The government has a legitimate role to play here because no single person has an incentive to protect the environment and conserve natural resources. In delivering a clean environment, government regulates a variety of business and economic activities. The government, however, must see to it that a legitimate social objective like a clean and green environment can be delivered without incurring prohibitive costs.

Suphachalasai, Zhuang, Samson, and Hope (2012) emphasized the imperative of “green growth” in Indonesia. Achieving green growth, according to the authors, is fraught with many interrelated concerns, including, mitigating risks of climate change and ensuring energy security. The objectives are not all consistent with each other. Cooperation at the local and international levels and sharing of best-practice techniques are indicated.

③ Enhancing Social Protection

In an era of globalization, economic volatility tends to happen with greater frequency. This is evident, for instance, from the various financial crises that broke out in the past few decades. Some are the results of genuine risks for which no insurance can be purchased. In many instances, human welfare declines. The government is mandated and well positioned

[12] World Bank. 2012. Investing in Indonesia’s Roads: Improving Efficiency and Closing the Financing Gap. Washington, DC.

to institute a social protection system that enables people who suffer setbacks during declines in economic activity to bounce back. In addition, there are truly disadvantaged citizens, such as the handicapped and elderly, who ought to be the covered by the social protection system in place.

2-4. Concluding Remarks

The prospects in the near future for growth and development for Indonesia are bright. Its recent macroeconomic performance attests to this. In the long run, Indonesia seeks to transform its economy into a more productive and industrializing economy, just like the four economic miracles in East Asia, namely, Hong Kong, Singapore, South Korea, and Taipei, China. To succeed in this development goal, Indonesian policymakers must pay attention to both short-run macroeconomic policies and to long-run policies supportive of productivity increases in all sectors of the economy.

Fiscal, monetary, and exchange-rate policies must be consistent and geared to providing a stable and predictable environment for the private sector. Financial constraints to labor productivity must be overcome, such as those that hamper the ability of micro and small enterprises to avail of bank credit and of entrepreneurs to make occupational switches.

In the long run, public policies need to incentivize families and enterprises to save and accumulate human, physical, technical, and social overhead capital. All this is in the service of enhancing productivity and growth, eliminating poverty, and raising living standards of all citizens.

To transit from a middle-income economy to a productive and industrializing economy calls for policy initiatives in several fronts. Sustained and inclusive growth rests on accumulating various forms of capital, underpinned by sound institutional arrangements and predictable government policies.

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Ⅲ. An Industrial Assessment of Indonesia

Manuel Albaladejo[13]

3-1. Introduction

Indonesia's economic performance over the last years has been impressive. The economy has grown well above the average for Southeast Asia (6.5 % in 2011), and inflation has been kept low and fiscal policy has been prudently managed. The fact the Indonesia emerged relatively unscathed from the global financial crisis is a proof of economic resilience and firmness. Many attribute that this has been driven not only by political reform but also by a buoyant domestic demand, particularly of a fast-growing middle-income class.

Once considered a new Tiger among the emerging East Asian economies, including Thailand and Malaysia, there is however one aspect that sets Indonesia apart: its recent growth story has little to do with manufacturing excellence. In the 1990s Indonesia's growth was driven by an export-oriented strategy, with labor-intensive manufacturing taking central stage. This trend was reversed in the 2000s as manufacturing stagnated considerably, which in turn led to a significant slowdown in the creation of better jobs.

There seems to be a consensus that Indonesia's impressive export growth has been driven by high commodity prices, particularly by China's insatiable hunger for primary products. While income earnings derived from commodity exports should be welcomed, the implications for equitable and sustainable growth cannot be underestimated. The real wage of Indonesia's unskilled labor, which constitutes the bulk of the labor force, has declined over the last five years, and some argue that the appreciation of the Indonesia rupiah by 20 % since 2000 is a sign of Dutch disease. This could erode further the competitiveness of Indonesia's manufacturing sector as it may become more cost-uncompetitive in the international scene.

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Indonesia should worry about the stagnation of its manufacturing sector as no other sector delivers the same economy-wide benefits. This has always been well understood in the East Asian context. Countries like Thailand and Malaysia, despite having strong natural endowments, continue to support and strengthen manufacturing as the engine of growth.

This publication is timely as there is a policy debate on the new sources of growth of Indonesia's economy. The government's new Master Plan to accelerate and enlarge economic development (MP3EI), puts an emphasis on the development of manufacturing along Indonesia's main economic corridors. Yet, there is the need for a thorough assessment of the current status of Indonesia's manufacturing sector and the identification of policy priorities going beyond the usual macro-economic recipes.

This paper aims at contributing to the existing debate on industrialization in Indonesia but providing an assessment of the country's industrial performance. It makes the point that boosting certain type of manufacturing activities (those that are high value added and technologically sophisticated) may be the only way to avoid the middle-income trap. The paper argues that supporting manufacturing may not be enough, and that efforts should be made to favor structural change towards certain strategic sectors.

3-2. Manufacturing: Engine of Growth for Indonesia

As highlighted by the World Bank, Indonesia needs a dynamic manufacturing sector to transform the economy, to generate quality jobs and to act as a catalyst for the development of the service sector (World Bank, 2012). Reviving the manufacturing sector in Indonesia calls, however, for solid justifications on its importance as a trigger of long-term growth. This is sometimes neither accepted nor understood by policymakers. Why would a country like Indonesia deviate from its current growth path, and diversify away from the highly profitable commodity sector? This is a reasonable question that Indonesian industrialists may have to confront, particularly when demand and price for raw materials are likely to stay for some more time.

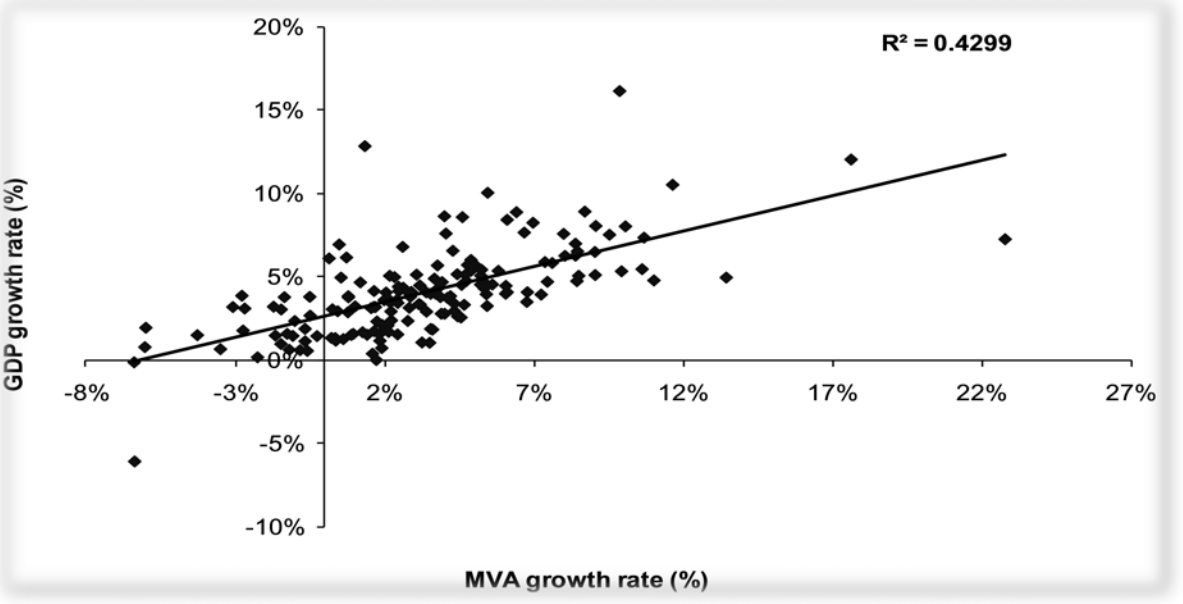
The justification for manufacturing goes beyond the short-term gains of foreign exchange, however big they may be. In his last book, the internationally acclaimed Cambridge

economist Ha-Joon Chang devotes one full section of the concluding chapter to make the point that manufacturing matters for long-term economic growth. In his words:

> *"History has repeatedly shown that the single most important thing that distinguishes rich countries from poor ones is basically their higher capabilities in manufacturing, where productivity is generally higher, and, most importantly, where productivity tends to (although does not always) grow faster than in agriculture and services" (Chang, 2007:213)*

Recent history in East Asia's economic development certainly provides solid arguments for reviving manufacturing in Indonesia. There is plenty of empirical evidence showing that if Indonesia is to sustain growth and reduce the income gap through more and better jobs, then the manufacturing sector should be top in the government's agenda. Five arguments support this statement:

Figure 3-2-1. Relation between GDP growth and MVA growth



Source: World Development Indicators

First, evidence has shown not only that industrialization is linked to economic growth, but also that *manufacturing can play a catalytic role in transforming the economic structure of agrarian societies*. The figure below, published in UNIDO's Industrial Development Report

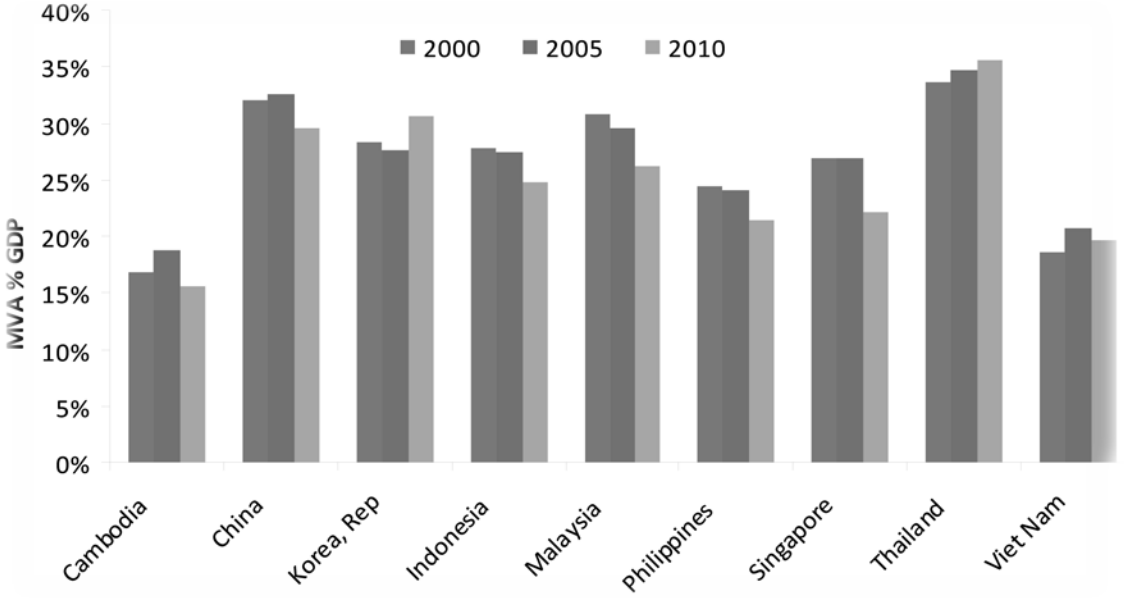
2009, shows the positive relationship between GDP growth and MVA growth for a sample of 131 countries. This supports Kaldor's first growth law;

Second, *manufacturing accounts for the bulk of world exports (80 per cent in 2010), and is less exposed to external shocks*, price fluctuations, climatic conditions and unfair competition policies. Prices of manufactured goods tend to be more stable than commodity prices tend to fluctuate more on the long run. Unfair competition policies have distorted prices around the world, closing down market prospects for agricultural exports from poor countries;

Third, *manufacturing breeds externalities in technology development, skill creation and learning that are crucial for competitiveness*. For instance, manufacturing is the main vehicle for technology development and innovation, representing today the hub for technical progress. Industry uses technology in many forms and at different levels to increase returns to investment by shifting from low- to high-productivity activities. Manufacturing also offers great potentials for informal innovation activities such us ad-hoc incremental improvements in products and processes.

Fourth, *manufacturing has a 'pull effect' on other sectors of the economy*. The development of the manufacturing sector stimulates the demand for more and better services: banking, insurance, communications and transport;

Figure 3-2-2. Manufacturing value added as percentage of GDP for Indonesia and comparators, (%)



Source: World Development Indicators

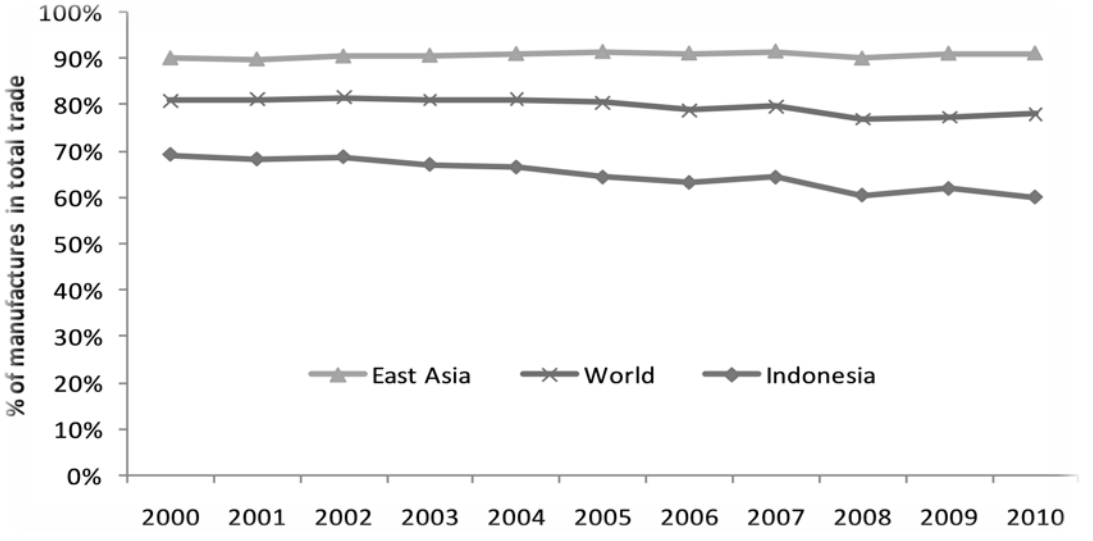
Fifth, the *internationalization of production has spread the benefits of manufacturing.* The spread of Multinational Corporations (MNCs) has benefited manufacturing more than any other sector of the economy. The trend towards vertical disintegration of production activity in industrialized countries means that developing countries have a better chance to participate in the global economy by inserting themselves into global value chains.

Indonesia needs to transform its sources of growth and make manufacturing the core engine. But this may not be enough, in the longer run and in order to speed up the industrialization process, this paper states that Indonesia may need to specialize in fast-growing, high-value added activities (more on this in section 3.6).

The stagnation of manufacturing in Indonesia is illustrated through two main indicators: the contribution of manufacturing value added (MVA) in GDP and the share of manufactured exports in total exports. Figure 2 shows that MVA as a share of GDP in Indonesia has declined over time, from 28 % in 2000 to 25 % in 2010.

Manufacturing progress in Indonesia is also reflected in its changing trading pattern. Manufactured trade as a share of total trade has declined from 69 % in 2000 to 60 % in 2008 (figure below). Today Indonesia exports 18 % less manufactures than the average for the world, and 30 % less than the average for East Asia.

Figure 3-2-3. Trends in manufactured trade as percentage of total trade for Indonesia, East Asia and the World, (%)



Source: UN-COMTRADE

3-3. Indonesia in the UNIDO's Competitive Industrial Performance Index

In its Industrial Development Report series, UNIDO publishes the competitive industrial performance (CIP) index to benchmark industrial national performance in the global economy. In a single measure, the index combines several dimensions of industrial performance to capture the ability of countries to produce and export manufactures competitively as well as their structural change towards high value-added, technology-intensive sectors. The box below shows the dimensions, indicators and calculation of the CIP index.

A total of 118 countries were ranked in UNIDO's Industrial Development Report 2011. Indonesia was 43 in the 2009 ranking down from 40 in 2005. In five years it was overtaken by Iceland, Romania and India. This paper presents an updated CIP index for Indonesia and a sample of East Asian countries for 2010 (see table below).

Table 3-3-1. CIP index for Indonesia and comparators

Ranking		Country	CIP index value	
2010	2000		2010	2000
1	1	Singapore	0.648	0.747
2	2	China	0.621	0.597
3	3	Korea, Rep.	0.524	0.567
4	5	Thailand	0.314	0.335
5	4	Malaysia	0.301	0.411
6	6	Philippines	0.277	0.314
7	7	Indonesia	0.164	0.236
8	9	Viet Nam	0.130	0.091
9	8	Hong Kong	0.107	0.208
10	10	Cambodia	0.055	0.090

Source: UNIDO's INDSTAT, UN Comtrade, World Development Indicators

The ranking positions are relatively stable over time, which confirms that industrial competitiveness is a path-dependent process where economic transformation takes time.

Changes are however possible. The results are expected as well as plausible: Singapore leads the pack, followed by China and South Korea. The case of Hong Kong is not surprise given the sweeping de-industrialization process that started in the late 1980s and has continued during the 1990s with the massive outsourcing of manufacturing activities to mainland China. Indonesia is 7th in this regional ranking but losing ground to Vietnam, which is catching up very quickly as shown in the CIP index value.

3-4. Industrial Capacity and Growth

Manufacturing value added (MVA) is the basic indicator of industrial performance. MVA in Indonesia grew from $46 billion in 2000 to around $71 billion in 2010. Despite the 4.4 % average annual growth Indonesia's share in global MVA remained 0.9 % of global MVA, which shows the industrial stagnation since 2005 (figure 2). Except Malaysia, Philippines and Hong Kong, all other regional comparators have seen faster MVA growth than Indonesia. Cambodia and Vietnam, with much smaller industrial bases than Indonesia, are seen double digit growth rates during the decade

Table 3-4-1. Manufacturing value added for Indonesia and comparators

Country Name	Manufacturing Value Added (US$ billon constant 2000)			Share in World MVA			Annual growth rate		
	2000	2005	2010	2000	2005	2010	2000 - 2005	2005-2010	2000-2010
Cambodia	0.6	1.1	1.6	0.0%	0.0%	0.0%	13.8%	7.6%	10.7%
China	384.9	630.8	1,069.1	6.7%	9.5%	14.2%	10.4%	11.1%	10.8%
Korea, Rep.	134.6	184.4	248.2	2.4%	2.8%	3.3%	6.5%	6.1%	6.3%
Indonesia	45.8	58.4	70.7	0.8%	0.9%	0.9%	5.0%	3.9%	4.4%
Hong Kong	5.5	4.3	4.4	0.1%	0.1%	0.1%	-5.2%	0.9%	-2.2%
Malaysia	28.9	36.3	40.7	0.5%	0.5%	0.5%	4.6%	2.3%	3.5%
Philippines	19.8	24.0	28.6	0.3%	0.4%	0.4%	3.9%	3.5%	3.7%
Singapore	24.0	29.5	41.7	0.4%	0.4%	0.6%	4.2%	7.1%	5.7%
Thailand	41.2	56.4	70.4	0.7%	0.9%	0.9%	6.5%	4.5%	5.5%
Viet Nam	5.8	10.0	15.6	0.1%	0.2%	0.2%	11.7%	9.3%	105%

Source: World Development Indicators

If we adjust for the size of the economy, then it is even clearer that Indonesia is still far away from the best industrial performers in the region. Indonesia's MVA per capita only grew by $80 from 2000 to 2010, but this has not affected its position in the regional MVA per capita ranking where it is only ahead of Vietnam and Cambodia (see table 3).

Table 3-4-2. Manufacturing value added per capita for Indonesia and comparators

Country	Ranking (US$)		Constant 2000 US$ per capita	
	2010	2000	2010	2000
Singapore	1	1	8,212.1	5,961.5
Korea, Rep.	2	2	5,024.2	2,862.4
Malaysia	3	3	1,432.9	1,236.3
Thailand	4	5	1,019.2	652.8
China	5	6	799.1	304.9
Hong Kong	6	4	629.1	831.2
Philippines	7	7	306.8	256.4
Indonesia	8	8	294.7	214.6
Viet Nam	9	9	179.9	74.5
Cambodia	10	10	114.1	47.0

Source: World Development Indicators

3-5. Manufactured Export Performance

Manufacturing value added analysis on its own does not always show how internationally competitive a domestic industry is. Take for instance the case of a highly protected economy. Inward-looking policies may distort the real competitive performance of a country as industries are not exposed to international competition and imports are restricted. It is therefore necessary to complement manufacturing value added analysis with some indicators of international competitiveness. Manufactured export performance is the commonly used variable to assess industrial competitiveness in world markets.

Trade in manufactures has boomed in the last decades due to the further fragmentation and internationalization of manufacturing activities around the world. MNCs have played an

instrumental role in spreading the benefits of trade through the outsourcing of production facilities to developing countries. Today, more than ever before, developing countries have a real chance to get inserted into global trading chains. The fact, however, that only a handful of developing countries have actually benefited from the new trading system show that there continue to be binding demand- and supply-driven constrains to export.

East Asia's trade performance has shone within the developing world – between 2000 and 2010 the region accounted for 77 % of the increase in developing countries' manufactured trade (UNIDO 2011). This trend has been reinforced by strong intra-regional trade ties among East Asian countries led by MNC's integrated production systems in medium- and high-tech sectors.

Indonesia's manufactured exports doubled between 2000 and 2010 from US$43 billion to US$94 billion (see table 4). Despite the 8.2 % average growth for the period, Indonesia lost a bit of world market share in manufactures, showing that Indonesia is not keeping up the pace of global manufacturing competitors.

Table 3-5-1. Manufactured exports for Indonesia and comparators

	Value of manufactured exports (US$ billion)			World market share (%)			Annual growth rate (%)		
	2000	2005	2010	2000	2005	2010	2000-2005	2005-2010	2000-2010
Cambodia	1.09	2.33	3.64	0.02	0.03	0.03	16.4	9.4	12.8
China	228.41	722.63	1,518.59	4.80	9.42	14.19	25.9	16.0	20.9
Hong Kong	22.14	16.55	8.12	0.47	0.22	0.08	-5.7	-13.3	-9.6
Indonesia	42.99	55.12	94.80	0.90	0.72	0.89	5.1	11.5	8.2
Korea, Rep.	166.51	277.72	451.70	3.50	3.62	4.22	10.8	10.2	10.5
Malaysia	87.64	120.62	165.59	1.84	1.57	1.55	6.6	6.5	6.6
Philippines	36.63	39.43	48.05	0.77	0.51	0.45	1.5	4.0	2.7
Singapore	129.67	215.41	315.84	2.72	2.81	2.95	10.7	8.0	93
Thailand	58.73	95.86	163.93	1.23	1.25	1.53	10.3	11.3	10.8
Viet Nam	6.76	17.50	50.06	0.14	0.23	0.47	20.9	23.4	22.2

Taking into account country size, Indonesia's manufactures per capita are only ahead of Cambodia in the region. In ten years Indonesia lost places to China and Vietnam, which

have seen a huge expansion of its manufacturing sector in global markets (see table 3-5-2).

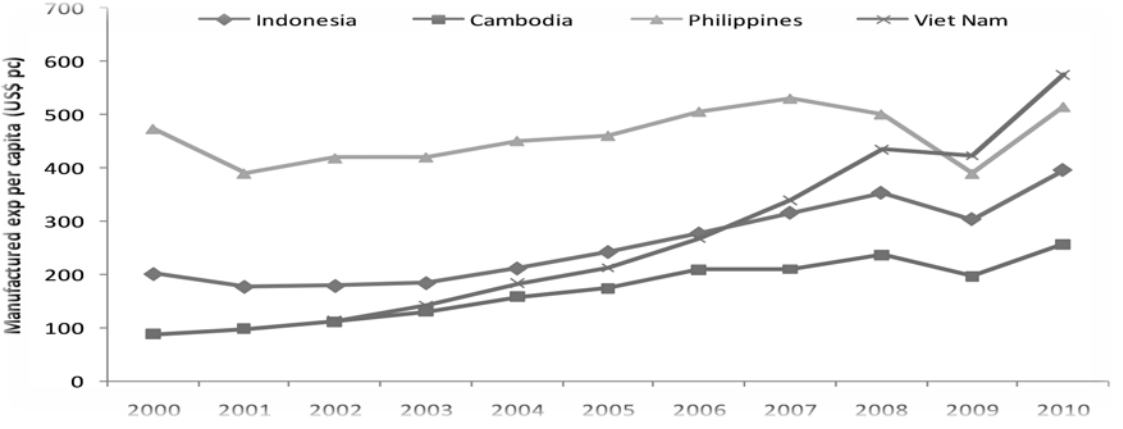
Table 3-5-2. Manufactured exports per capita for Indonesia and comparators

Country	Ranking		Current US$ per capita	
	2010	2000	2010	2000
Singapore	1	1	62,213.1	32,191.8
Korea, Rep.	2	3	9,141.9	3,542.2
Malaysia	3	2	5,830.4	3,743.1
Thailand	4	5	2,371.6	930.0
Hong Kong	5	4	1,148.2	3,322.3
China	6	8	1,135.1	180.9
Viet Nam	7	10	575.9	87.1
Philippines	8	6	515.2	473.8
Indonesia	9	7	395.2	201.5
Cambodia	10	9	257.7	87.6

Source: UN Comtrade and World Development Indicators

Next figure looks at the evolution of Indonesia's manufactured export per capita over time. We clearly see that at the beginning of the decade Indonesia had a strong manufactured export base than Vietnam, but lost its advantage in the mid 2000s. It is also interesting to see how all these countries have recovered relatively quickly from the global financial crisis, which first affected Philippines (the more export-oriented country).

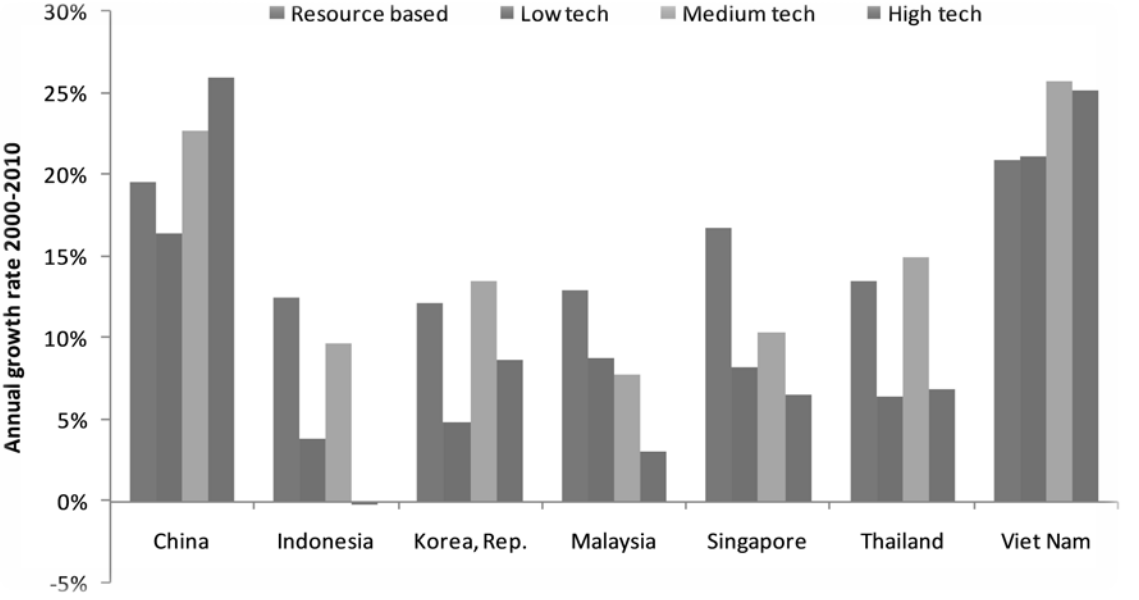
Figure 3-5-1. Evolution of manufactured exports per capita for Indonesia and comparators



Source: UN Comtrade

What has driven Indonesia's manufactured trade for the period 2000-2010? While labor-intensive low-tech manufactures represented the bulk of Indonesia's manufactured trade in the past, resource-based manufactures have taken the driving seat. Resource-based manufactured exports grew at an average 12.5 per cent per annum between 2000 and 2010 (see Figure 3-5-2). This contrasts with the much lower growth rate experienced by low-tech exports. More worryingly is the fact that high-tech export growth declined by 0.1%, the only country in the region that has experienced this trend in the last decade.

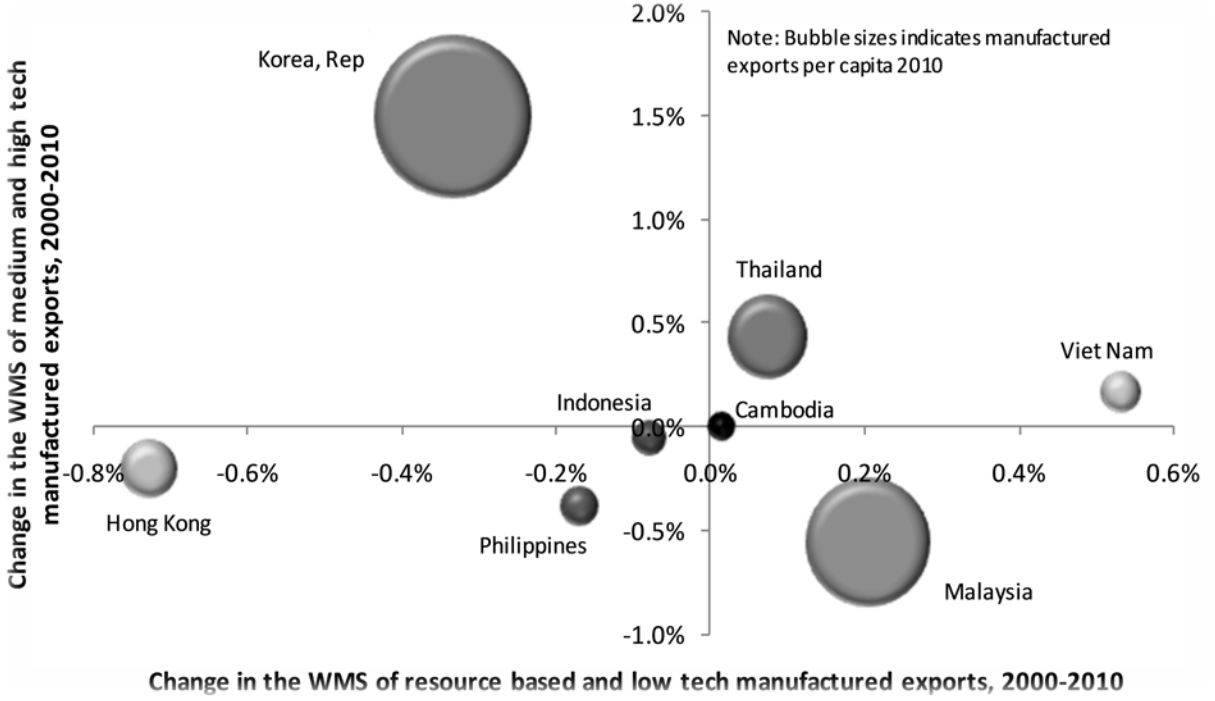
Figure 3-5-2. Annual growth rate of manufactured exports by technology intensity for Indonesia and comparators



Source: UN Comtrade

Perhaps the most noticeable aspect in Indonesia's manufactured trade performance is the fact that, despite resource-based and low-tech manufactures being the country's 'bread and butter' given the surplus in labor and rich natural endowments, Indonesia has lost market share in this 'simple' manufactures (Figure 3-5-3). South Korea has also lost market share in resource-based and low-tech manufactures but gained an astonishing 1.5 % of world trade in highly sophisticated manufactures.

Figure 3-5-3. Changes in the world market share of manufactured trade for Indonesia and comparators



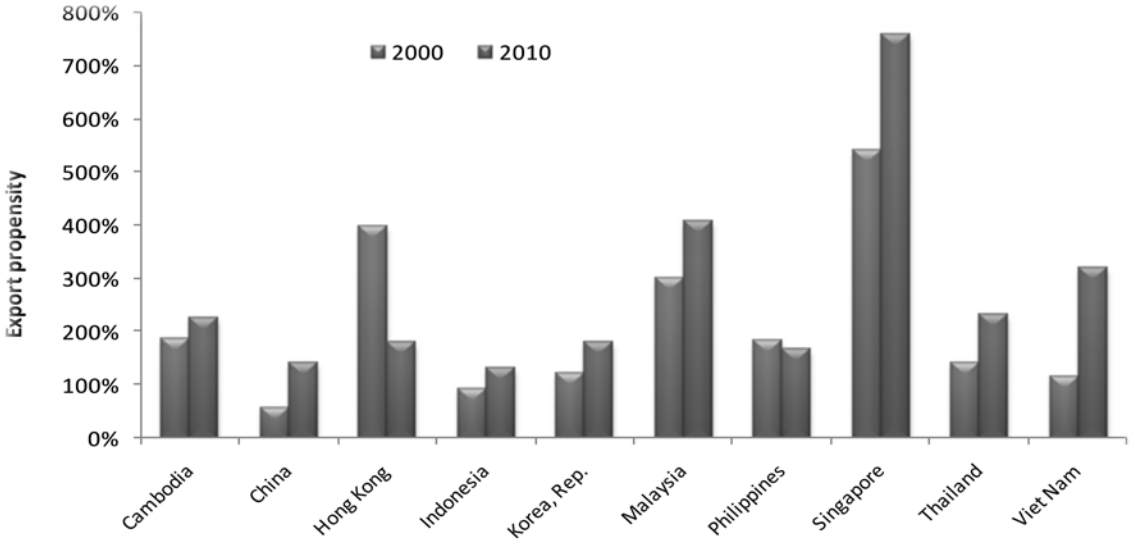
Source: UN Comtrade

Note: WMS = World Market Share

The figure below confirms that is East Asia is the region with the highest export orientation within the developing world. Note that all countries, except Hong Kong and the Philippines, have increased their export propensity during the period 2000-2010, with ratios well over 100 per cent.[14] Indonesia is not a very export-oriented economy given his huge and growing domestic demand, a feature that shares with China.

[14] The values can be over 100 because the numerator (manufactured exports) is in total terms while the denominator (MVA) is only the value added and not the industrial output.

Figure 3-5-4. Export propensity for Indonesia and comparators: manufactured exports as per unit of total MVA, (%)



Source: UN Comtrade

In the context of trade liberalization, economic reform and stiff international competition, Indonesia's manufactured export performance has been disappointing, particularly at the higher end of the manufacturing spectrum. Indonesia needs to diversify urgently and enter (or re-enter) into new activities, but the challenge will be making them truly competitive. Next section argues that to sustain economic growth, Indonesia may have to rely heavier on technology-intensive manufactures and make some of them world class.

3-6. Structural Change

Under standard trade theory, export structures per se do not matter as factor endowments determine the comparative advantage of countries. Thus, resource-rich countries would export primary products or/and resource-based manufactures; cheap and labour-abundant countries, like Indonesia, would specialize in low value-added manufactures; while sophisticated manufactures would have the resource-scarce but rich countries as the only global suppliers. Obviously this view does not raise policy issues – if factor endowment is

such a determinant force, why should policy makers be concerned about what to produce and export?

The good news for countries hoping to scale up the ladder is that recent evidence has proved that orthodox theory may be too simplistic in explaining trade and production patterns throughout the world. New research shows that externalities and learning effects derived from sectoral specialization matters and that shifts between activities do not occur automatically and without cost. Thus, countries' production and trade structures are not only determined by factor endowments but also by domestic technological capability building. In fact, few would deny that skill acquisition, incremental learning and technological effort is behind the industrial success of South East Asia.

What is perhaps more interesting is that new evidence shows that not all sectors are equally beneficial for growth, and therefore what a country produces and exports matters a great deal. This statement has significant implications for policy, and it is not surprise that the debate on structural change is now at the core of the policy agenda in most developing countries. What this also means is that prior to devising the policy instruments and building technological capacities, policy makers need to understand what sectors are more desirable. The criteria of 'desirability' obviously vary from country to country and will depend on national priorities, which among many other include job creation, food security, diversification, import substitution, export competitiveness and fostering industrial backward and forward linkages.

Achieving structural change is not easy task. It requires the creation of sector-specific capabilities at the policy, institutional and firm level. Getting the macro conditions right and letting the market forces do the trick will not work. While private entrepreneurship will always be the driving force, governments can play a major role towards structural change by reducing the costs and risks associated with entering into new activities.

Structural change takes many forms. Section 3.2 highlighted the importance of manufacturing activity and industrialization as a catalyst for economic transformation in Indonesia. In its very broad form, then structural change can be conceived as the shift towards manufacturing excellence both in production and trade (see figures in chapter 2). But structural change also happens within manufacturing. Evidence suggests that technology-intensive structures can lead to achieving faster growth for the following reasons:

Over the long run, technology-intensive activities tend to grow faster in trade than simple activities, and they also account for a greater share in total manufactured trade. Medium- and high-technology exports grew at 8 per cent between 2000 and 2010, well above the average for less sophisticated products. Despite the slippage of recent years due the commodity price boom and the stronger presence of resource-based exports, complex exports (medium- and high-tech exports) continue to dominate world trade as they account for 60 per cent of total manufactured exports;

Technology-intensive sectors are less vulnerable to entry by competitors, and therefore enjoy higher and more sustainable margins. Resource-based and low- technology activities are more exposed to competitive pressures as the capabilities required to enter the industry are relatively low and therefore more accessible to newcomers. Competitive advantages in these sectors often come from price rather than quality or brand names. In contrast, technology-intensive activities call for more complex capabilities and processes that impose greater barriers to entry;

Technology-intensive activities offer higher learning and productivity potential as well as greater spillover benefits to other activities. Capabilities in technology-intensive industries are grounded in shared disciplines, notably mathematics, physics, engineering, and computing. Strong capabilities based on scientific knowledge can be adapted to the particular demands of other activities at a faster pace. As technology in these sectors also changes rapidly, learning and innovation become crucial to sustain competitiveness.

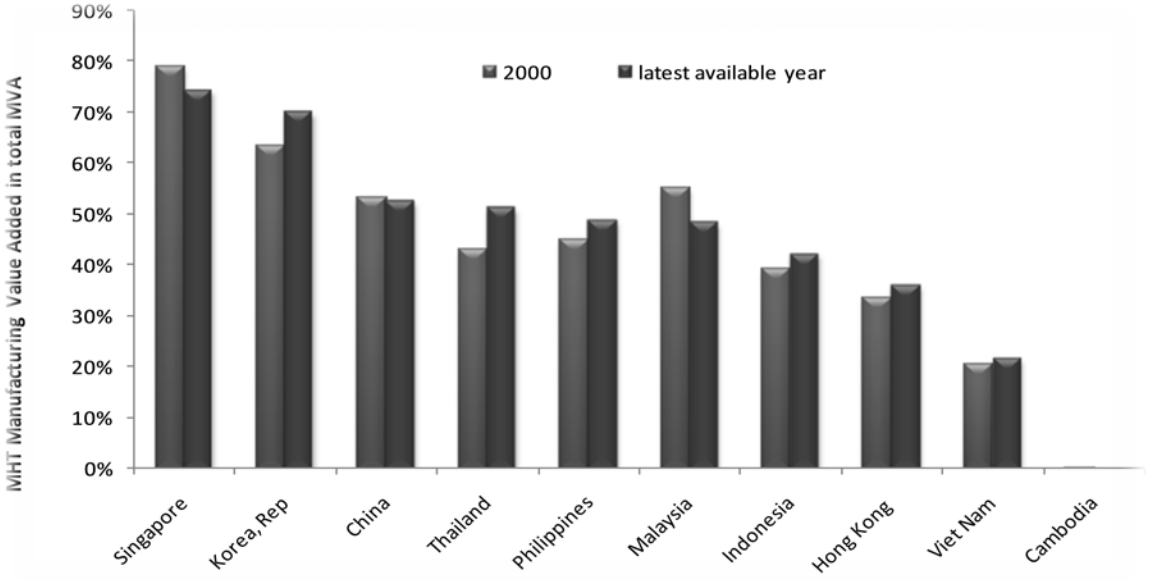
This has important implications for Indonesia's industry, which heavily relies on price competition in low-productivity low-technology sectors. As industry evolves, salaries rise and competition toughens, Indonesia's industrial sector will face pressures to move up the technology ladder.

This paper uses UNIDO's technological classification to shed light on the evolution of production and export structures in Indonesia and comparators. It distinguishes between resource-based, low-technology, medium-technology and high-technology products both in manufacturing value added and manufactured exports.[15] The technology classification,

[15] Examples of resource based manufactures include prepared meats/fruits, beverages, wood products, vegetable oils; and ore concentrates, petroleum/rubber products, cement, cut gems, glass. Examples of low tech manufactures include textile fabrics, clothing, headgear, footwear, leather manufactures, travel goods; as well as pottery, simple metal parts/structures, furniture, jewellery, toys, plastic products. Examples of medium tech manufactures are Passenger vehicles and parts, commercial vehicles, motorcycles and parts, synthetic fibres, chemicals and paints, fertilizers, plastics, iron, pipes/tubes; as well as engines, motors, industrial machinery, pumps, switchgear,

albeit significant caveats, provides interesting insights on industrial transformation.[16] A shift of the production and export structure towards 'complex' activities gives an indication of domestic technological deepening and upgrading.

Figure 3-6-1. Share of medium- and high-tech MVA in total MVA for Indonesia and comparators, (%)



Source: UNIDO´s INDSTAT

ships, and watches. Examples of high tech manufactures include office/data processing/telecom equip, TVs, transistors, turbines, power generating equipment; as well as pharmaceuticals, aerospace, optical/measuring instruments, cameras. For a detailed SITC rev 2, 3 digit level classification, see UNIDO 2003, UNIDO 2004 and UNIDO 2009.

[16] This technology classification and its assumptions present caveats that need mention. First, there are sophisticated processes and products in 'simple' sectors, and similarly cheap, labour-intensive activities in 'complex' sectors. This is for instance the case of computerised-aided design in the clothing industry, and the assembly process in the semiconductors industry. Can we say for instance say that Italy has a less sophisticated industry than the Philippines just because it specializes in top-end clothing design while the latter assembles chips? This methodology aggregates sectors to the extent that it sometimes overlooks these significant differences. Second, the technology classification fails to pick up upgrading within sectors – technology upgrading only happens when a country shifts from one industry to another. This is a major limitation that can only be overcome through value chain analysis. It is therefore important to take account of these limitations when providing policy recommendations.

Figure 8 presents the evolution of Indonesia's MVA structure towards medium- and high-tech sectors compared to other countries in the region.17. Compared to other countries in the region, Indonesia's industrial structure is technologically not very sophisticated – the share of medium- and high-tech sectors in total manufacturing value added is around 40 per cent. Singapore and South Korea have the most sophisticated production structures.

Table 3-6-1. Evolving manufactured export structures by technology intensity in Indonesia and comparators, (%)

	2000				2010			
	High tech	Med tech	Low tech	Re-source based	High tech	Med tech	Low tech	Re-source based
Cambodia	0.1	1.2	93.0	5.7	0.3	7.6	90.0	2.0
China	21.2	24.3	45.4	9.1	32.2	28.3	31.2	8.3
Hong Kong	25.8	11.3	58.5	4.4	27.9	25.8	25.0	21.3
Indonesia	14.9	19.5	31.9	33.7	6.6	22.4	21.2	49.7
Korea, Rep.	35.1	35.3	17.9	11.7	29.7	46.2	10.7	13.5
Malaysia	55.1	21.3	9.8	13.8	39.6	23.9	12.0	24.5
Philippines	69.0	12.4	11.9	6.6	63.2	16.5	6.9	13.4
Singapore	59.4	20.9	6.9	12.8	46.0	23.0	6.2	24.8
Thailand	32.4	27.2	21.9	18.5	22.6	39.2	14.7	23.5
Viet Nam	11.1	10.3	64.7	13.9	14.2	13.8	59.4	12.6

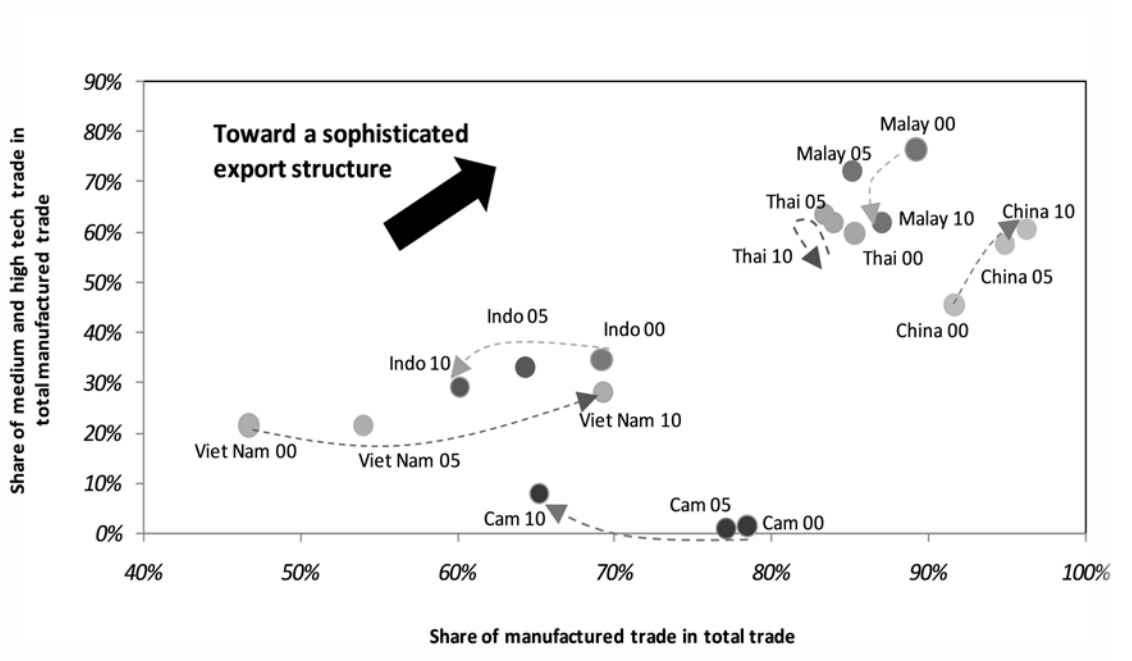
Source: UN Comtrade

Indonesia's manufactured export structure in 2010 has changed since 2000, with resource-based exports now accounting for almost 50 % of total manufactured trade. In only 10 years, Indonesia's resource-based exports skyrocketed from US$14 billion to more than $47 billion. However these mammoth figures put in a global perspective give a slight different picture – they only represent 1.9 % of global trade for resource-based products.

[17] Medium- and high-technology products are grouped together as ISIC rev2 at 3 digit level does not allow for finer distinctions. This is a major difference with SITC, which provides a more refined product category allowing us to make clear-cut distinctions in the technology classification of exports.

Figure 9 sums up the evolution of Indonesia's export structure towards sophisticated products. Indonesia is not moving towards the desired industrial path. Not only has the country experienced a stronger reliance on the primary sector, but it has also failed to move the technology ladder within manufacturing. Therefore the challenge for Indonesia is two-fold: revitalize the manufacturing sector, and make sure that over time there is a process of industrial deepening towards sophisticated sectors that generate economy-wide externalities. It is about the country's future ability to nurture private entrepreneurship in other activities rather than the traditional labor-intensive and resource-based manufactures. The challenge is about moving up the technology ladder and taking the 'high road' to competitiveness rather than relying on the dangerous developmental cycle of low salaries, low prices, low margins, ultimately leading to 'immiserasing growth'.

Figure 3-6-2. Evolution of export structure towards manufactured exports and technology-intensive exports for indicators and comparators, (%)



Source: UN Comtrade

3-7. Product and Market Diversification

Diversification, both of products and markets, is another key factor to industrial competitiveness. Recent evidence shows the positive relationship between industrial diversification patterns and income levels (Imbs and Wacziarg, 2003). Low-income slow growing countries need to diversify their production structure to achieve larger productivity gains. Other study indicates that the same relationship holds true for export diversification (Carrère, Strauss-Kahnand Cadot, 2007). In short, it appears that diversification, understood as a discovery process by entering into new activities, matters for competitiveness. According to Hausmann and Rodrik (2005), a broad industrial and export base facilitates the entry and exit of firms, which constitutes the foundation of a globally competitive economy – productive firms will enter and expand while less competitive ones will close down.

Market diversification has been less researched but it appears that the same principles apply – exporting to many countries shows the ability to compete internationally, making exporters less vulnerable to external shocks, demand slowdown and competition.

In sum, the externalities of accessing new markets with new products are at the core of a country's path to industrial competitiveness. Technologies need to be mastered and marketing channels created to open up potential selling outlets. Specialised skills need to be developed and institutions shaped to support firms engaged in new product lines. Trade diversification may be a costly, risky and long-term process, but the potential developmental benefits cannot be underestimated.

This section deals with product and market diversification in Indonesia. This is particularly relevant as Indonesia is struggling to get into new non-traditional export products and reach new markets.

3-7-1. Manufactured product diversification index

Diversifying for the sake of it is may not be the best policy choice. In fact product concentration can be justified by world demand for it makes no sense to diversify away into product lines that have little or no market demand. What this all means is that analysis on product diversification requires an exploration not just of a country's export structure but also of the world's export structure. The logic is that if supposedly a country has a similar export

structure to that of the world, then it is fully geared to serve global demand. The manufactured product diversification index presented in this paper, and explained in the methodological box below, provides insights on Indonesia's diversification pattern vis-à-vis other comparators.

Box 2. Methodology of the manufactured product diversification index

This methodology draws from UNCTAD in the elaboration of a product diversification index. However there is one major difference: it only looks at diversification within manufactured exports, excluding primary exports and other transactions (it is then a manufactured product diversification index).

The manufactured product diversification index shows the extent to which a country depends on particular products relative to world exports. In other words, it compares a country's export structure with the world's export structure.

The formula used is the following:

$$DX_j = 1 - \frac{\sum \left| h_{ij} - h_i \right|}{2}$$

Where DX is the manufactured diversification index value of country $_{j,}$

$\sum$ is the sum of all values in brackets

h_{ij} is the share of product $_i$ in total manufactured exports of country $_j$

h_i is the share of product $_i$ in total world manufactured exports

Once the manufactured diversification index values have been obtained, values are standardised following the formula for the calculation of the CIP index. Yet to obtain a ranking where 1 is best (more diversified), and 0 is worst (less diversified), we have to reverse the value order (i.e. one minus standardised manufactured product diversification index value)

Indonesia ranks 6th out of eleven countries in the index, having lost two places to Singapore and Malaysia since 2000. This depicts higher product concentration on a limited range for export products. This should be a serious concern to Indonesia's export sector as it makes it highly exposed and vulnerable to changing demand and third country competition. Indonesia's top five manufactured exports account for 33 per cent of all manufactured trade (see figure 10). Although the concentration may look similar to that of Thailand and China,

though the nature of the products is very different – computer equipment, office equipment and semiconductors are among China and Malaysia's five main manufactured exports.

Table 3-7-1. Manufactured product diversification index for Indonesia and comparators

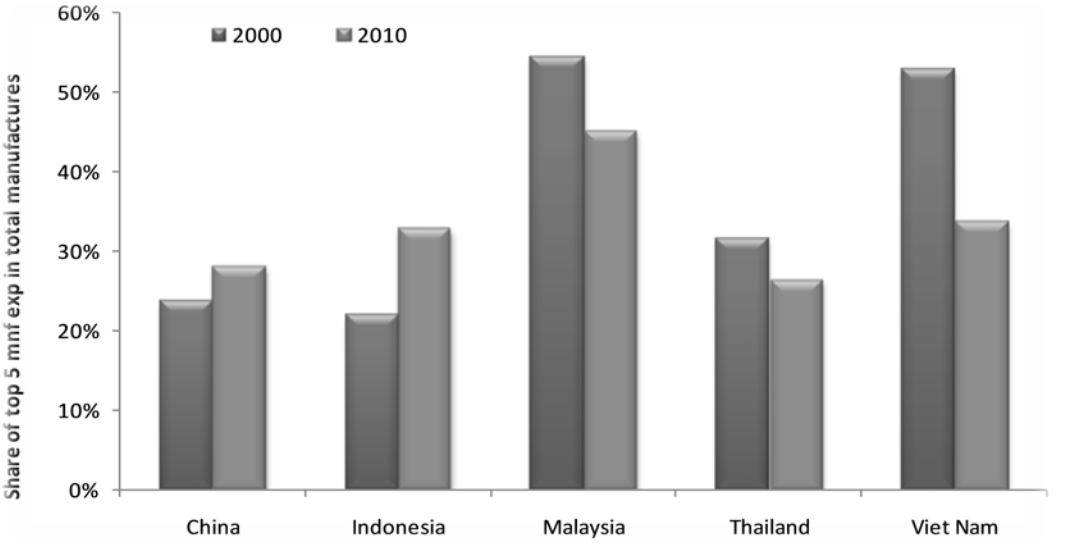
Country	Ranking		Index value	
	2010	**2000**	**2010**	**2000**
Thailand	1	2	0.666	0.618
China	2	3	0.606	0.557
Korea, Rep	3	1	0.604	0.631
Singapore	4	5	0.531	0.520
Malaysia	5	6	0.520	0.475
Indonesia	6	4	0.477	0.524
Viet Nam	7	8	0.425	0.353
Philippines	8	7	0.364	0.373
Hong Kong	9	9	0.354	0.345
Cambodia	10	10	0.101	0.084

Source: UN Comtrade

3-7-2. Market diversification index

While a country's export structure is determined by factor endowments and technological capabilities, market orientation is normally determined by other set of factors, including location, transport logistic, trade agreements, foreign firms' nationality and even cultural ties (for instance to formal colonial powers). There is also the strategic element – this is the vision and capacity to serve the better market (defined as that that brings more economic gains to the country).

Figure 3-7-1. Share of top five manufactured exports in total manufactured exports for Indonesia, Vietnam, China, Malaysia and Thailand, (%)



Source: UN Comtrade

The market diversification index has the same logic than the manufactured product diversification index presented earlier. The capacity of import absorption by new markets needs to be taken into account in any market diversification strategy. For instance, it is not very strategically sound to concentrate 50 per cent of your manufactured exports in the EU, which currently imports almost 40 per cent of world manufactures, than to Sub-Saharan Africa, which only represents 1 per cent. The box below shows the calculation of the market diversification index for Indonesia and comparators.

Indonesia's manufactured trade is rather diversified, which may have to do with the country's efforts to liberalize its trade and seek new trading partners. Indonesia is fourth in the ranking having lost just one place to Vietnam in 2010. Whether this has been intentional through export promotion and trade policy or driven by other factors is not yet clear. Whatever the case, the important fact is that Indonesia's market diversification is a safe haven to protect itself from stronger presence of key competitors in big markets.

Box 3. Methodology of the market diversification index

The methodology of the market diversification index follows the logic of the manufactured product diversification index explained before. It shows the extent to which a country depends on particular markets for its manufactured exports relative to how important those markets are in world manufactured imports.

For this exercise we consider eight markets: the EU, the US, Sub-Saharan Africa, Latin America, East Asia, South Asia, Middle East and North Africa, and the 'rest' category; and we only take the manufactured export category aggregated as if it was only one product.

The formula used is the following:

$$DM_j = 1 - \frac{\sum \left[h_{ij} - h_i\right]}{2}$$

where DM is the market diversification index value of country $_j$,

$\sum$ is the sum of all values in brackets

h_{ij} is the country's market share of manufactured products $_i$ in the country's total manufactured exports to the world $_j$

h_i is the market's import share of all manufactured products $_i$ in total world manufactured imports

Once the market diversification index values have been obtained, values are standardized following the formula for the calculation of the CIP index. Yet to obtain a ranking where 1 is best (more diversified), and 0 is worst (less diversified), we have to reverse the value order (i.e. one minus standardized market diversification index value)

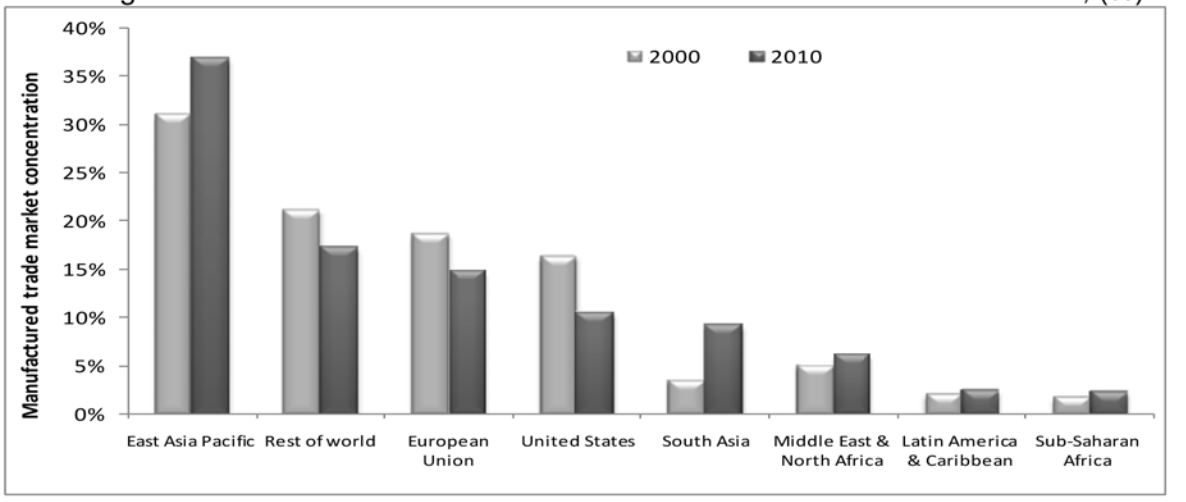
Indonesia's favorable performance in the market diversification index has to do with its strong presence in three main market outlets, East Asia, the EU and the rest of the world category (see figure 11). The strong regional orientation is worth noticing to the extent that East Asia absorbs most than 35 % of Indonesia's manufactured exports in 2010.

Table 3-7-2. Market diversification index for Indonesia and comparators

Country	Ranking		Index value	
	2010	**2000**	**2010**	**2000**
China	1	2	0.829	0.741
Korea, Rep.	2	1	0.739	0.746
Viet Nam	3	5	0.738	0.717
Indonesia	4	3	0.730	0.729
Thailand	5	4	0.710	0.722
Malaysia	6	6	0.673	0.691
Philippines	7	7	0.658	0.690
Cambodia	8	10	0.607	0.499
Hong Kong	9	9	0.604	0.631
Singapore	10	8	0.565	0.665

Source: UN Comtrade

Figure 3-7-2. Indonesia's manufactured trade concentration in main markets, (%)

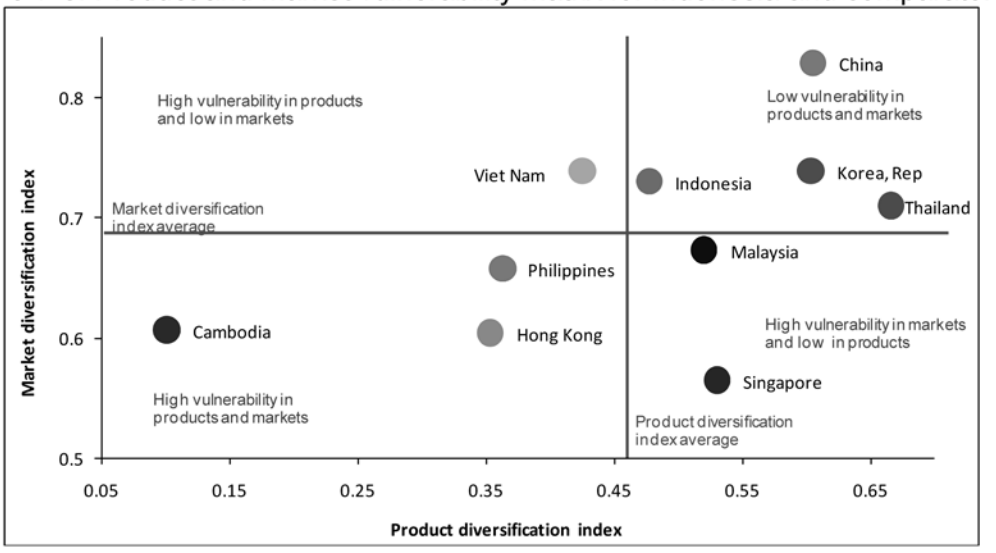


Source: UN Comtrade

3-7-3. Vulnerability matrix

The figure below combines the manufactured product diversification index and the diversification market index to produce a vulnerability matrix in which countries can be placed according to their index values. Four vulnerability quadrants are created using the index value averages and the rationale is that the higher the diversification (in products and markets) the lower the vulnerability.

Figure 3-7-3. Product and market vulnerability matrix for Indonesia and comparators, 2010



Source: UN Comtrade

China, South Korea, Thailand and Indonesia are highly diversified both in products and markets and therefore face low vulnerability to changing demand, price fluctuations and third country competition. At the other side of the spectrum are Hong Kong, Cambodia and the Philippines. The case of Cambodia is particularly worrisome: it does not only count with few export products – all of which are bottom-end labour-intensive manufactures – but it also concentrates more than two thirds of its manufactured exports in North America, making it as vulnerable as Mexico in the medium and long run.

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IV. The Current Status and Challenges of Major Industrial Sectors

Cheul Cho, Kyoung-Sook Lee, Sung-In Hong, Hoon Park[18]

Following the two previous chapters which provided an overview of the macro-economic status and industrial development in Indonesia, this chapter will analyze and further explore the status and the challenges major industrial sectors specifically face. The four strategic industrial sectors mentioned in the first chapter, which are Automobiles, Consumer Electronics, Shipbuilding, and Textile & Clothing, will be discussed in detail here.

4-1. Automobiles

4-1-1. Global Automotive Industry Trends and Outlook

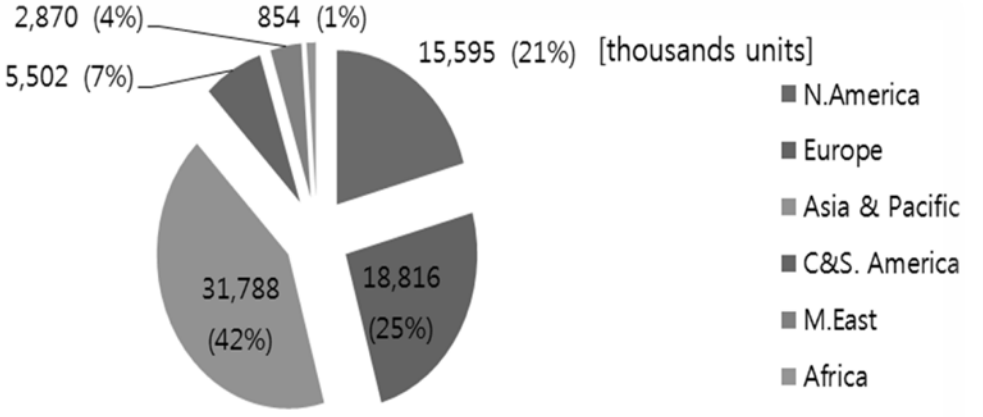
① Current Status of Global Automobile Market

The global automotive market recorded sales of 75,427 thousand units in 2011, and this number is predicted to continuously rise. In 2010/11, the sales rose slightly by a mere 2.1%, after a stimulus rate of 14.2% in 2009/2010. Looking at the sales by regions, major markets are positioned in the developed areas of North America, Europe and East Asia, and the sum of these three regions accounted for 88% of total global automotive market in 2011. In contrast, the shares of developing areas were meager, and the two regions, Middle East and Africa, accounted for only 5% of the market. By countries, USA, Canada, EU as one entity, and Japan occupied 45.1% of the global automotive sales, which implies the overwhelming

[18] The four authors of this chapter are all Research Fellows of KIET. Automobiles has been written by Cheul Cho, Consumer electronics by Kyoung-Sook Lee, Shipbuilding by Sung-In Hong, and Textiles & Clothing by Hoon Park

weight of developed countries in the global sales of automobiles. However, it should be noted that recently BRICs, a collective name referring to the four countries of Brazil, Russia, India and China, are rising as major automotive market. Especially, China arose as the largest automotive market in 2009, and the sales in China for 2011 reached 18,505 thousand units, accounting for an astounding 24.5% of the world total. Meanwhile, Brazil, India, Russia respectively ranked as the world's 4th, 6th and 7th in 2011.

Figure 4-1-1. Vehicle Sales by Region (2011)



Source: KAMA

② The Status of the ASEAN Automotive Market

ASEAN's contribution to the global automotive sales was only 3.2% in 2011, and by regions it is still one of the lowest in the world. Major automotive markets in ASEAN include Indonesia, Thailand, and Malaysia. The share of these three countries in ASEAN automotive market is 89.3% with Indonesia ranked as the largest automotive market in 2011. Recently, Vietnam and Indonesia have witnessed rapid growth in automotive sales. Their annual increase rates of automotive sales during 2006~2011 were 22.9%, 22.1% respectively. In Vietnam, automotive sales totaled 111 thousand units. While this figure is still one of the lowest in the region, Vietnam has the fastest growing rate out of ASEAN members.

Table 4-1-1. Motor Vehicle Sales of ASEAN Countries

	2009	2010	2011	share
Thailand	548,871	800,354	794,081	31.0%
Indonesia	483,548	764,712	894,164	34.9%
Malaysia	536,905	605,156	599,329	23.4%
Philippines	132,444	168,490	141,616	5.5%
Vietnam	119,460	112,224	110,938	4.3%
Singapore	58,271	33,192	21,117	0.8%
Total	1,879,499	2,484,128	2,561,245	100.0%

Source: FOURIN Asia Automotive Intelligence, 2012.2.

③ Major Automotive Manufacturing Countries

Until 2005, United States consistently led the world in automobile production. However, by 2006, Japan had caught up with the U.S, and in 2009 China took over as the world's largest automotive producer. Recently, the BRICs have risen as a new power to be reckoned with in the global automotive industry. In 2011, China produced 22.9% of the global automobile production and India and Brazil were the 6th and 7th largest car producers in the world. On the other hand, Korea was the 5th largest automobile producer with production reaching 5.8% of the world total in 2011. Among the countries with an advanced automobile industry, Korea is the only automobile producer that have experience production growth compared to 2005.

Table 4-1-2. Top 10 Automotive Manufacturing Countries

Rank	2011		2005	
	Country	Production Units	Country	Production Units
1	China	18,419	USA	11,947
2	U.S.A.	8,646	Japan	10,800
3	Japan	8,399	Germany	5,758
4	Germany	6,304	China	5,701
5	Korea	4,658	Korea	3,699
6	India	3,940	France	3,549
7	Brazil	3,406	Spain	2,764
8	Mexico	2,680	Canada	2,688
9	Spain	2,354	Brazil	2,528
10	France	2,278	UK	1,803
World Total		80,524	-	67,204

Source: KAMA

The ASEAN share of global automobile production is 3.7% and the top three automobile producers in ASEAN are Thailand, Indonesia, and Malaysia. In 2011, these three countries produced 94.5% of total vehicle production in the ASEAN region.

Table 4-1-3. Motor Vehicles Production Performance of ASEAN

	2009	2010	2011	Share
Thailand	999,378	1,645,304	1,457,795	48.7%
Indonesia	464,816	702,508	837,948	28.0%
Malaysia	489,269	567,715	533,515	17.8%
Philippines	62,523	80,477	64,906	2.2%
Vietnam	107,760	106,166	100,465	3.4%
Total	2,123,746	3,102,170	2,994,629	100.0%

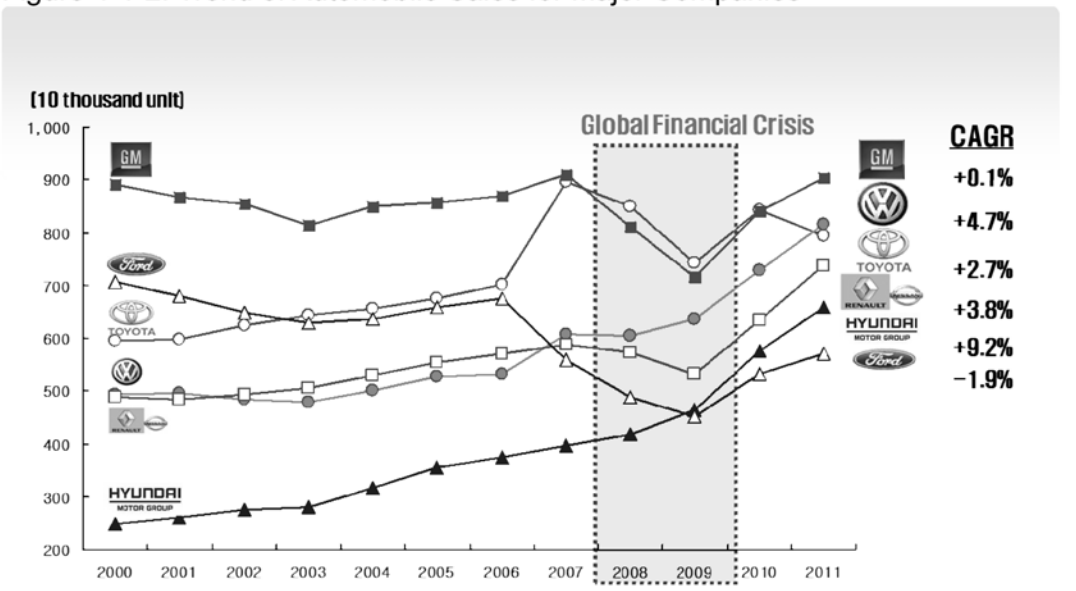
Source: KAMA

④ Major Competitors in the Global Automotive Market

Global car manufacturers such as Hyundai and Volkswagen have been steadily developing with bright prospects for further growth. They are not only expanding their market share in the global automotive markets, but they are also securing good profit. On the other hand, the production capacity and work positions of US firms, such as GM, Ford, and Chrysler have decreased on account of poor management conditions, decreased market share, and low profit rate.

New global players such as China and India (Shanghai Automotive, First Automobile Works (FAW), Chery, Geely, TaTa) are entering into the global automotive industry. For China, India, and other developing countries the role of foreign automotive manufacturers is very important. For example, General Motors (GM) and Volkswagen are major joint-venture partners of Shanghai Automotive manufacturing company and FAW. Major Asian automotive companies (Hyundai, Toyota, and Honda) have also produced automobiles by joint ventures with Chinese car makers. In addition, major automotive manufacturers (Hyundai, Suzuki, Ford, GM, and Toyota) have also installed production plants in India. Along with this trend, China and India are also investing a lot of effort in supporting the growth of indigenous automobile brands.

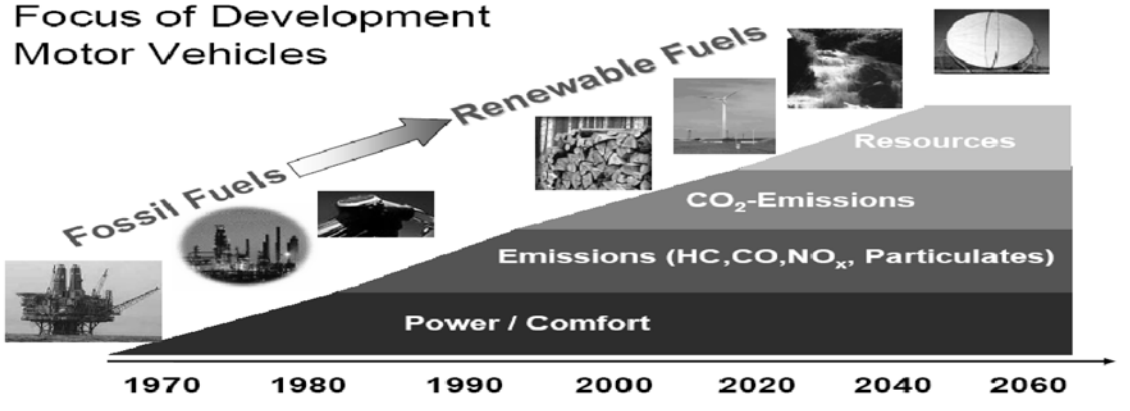
Figure 4-1-2. Trend of Automobile Sales for Major Companies

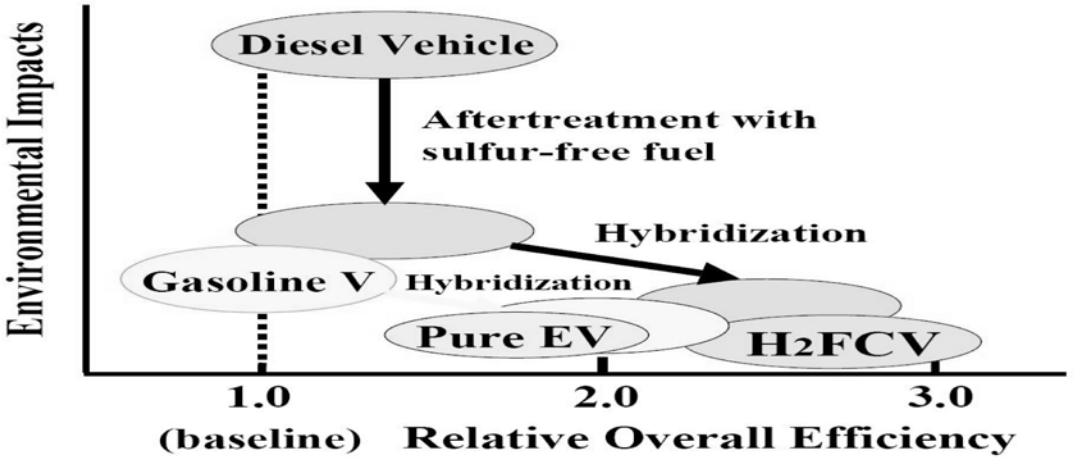


Source: Hyundai·Kia and Global Insight, 2011 year

⑤ New Trends in Automotive Technology

The automotive industry is now faced with environmental issues with the regulation of particulate matter and greenhouse gases, and the development & marketing of electric automobiles. Thus the latest trends in automotive technology are low-emissions vehicles, high-efficiency cars, and vehicles using renewable fuels. High-efficiency engine technologies include energy-saving engines and transmissions, lightweight materials, and advanced diesel engines. Renewable-fuel technologies include hybrid, electric and fuel-cell vehicles, solar energy automobiles and other low emission, fuel efficient cars.





Most of the major car makers are now producing HEVs (Hybrid Electric Vehicles) and are expressing interest in EVs (Electric Vehicles). GM and Toyota are also developing PHEVs (Plug-in HEVs).

Table 4-1-4. The Eco-Car Strategies of Major Car Makers

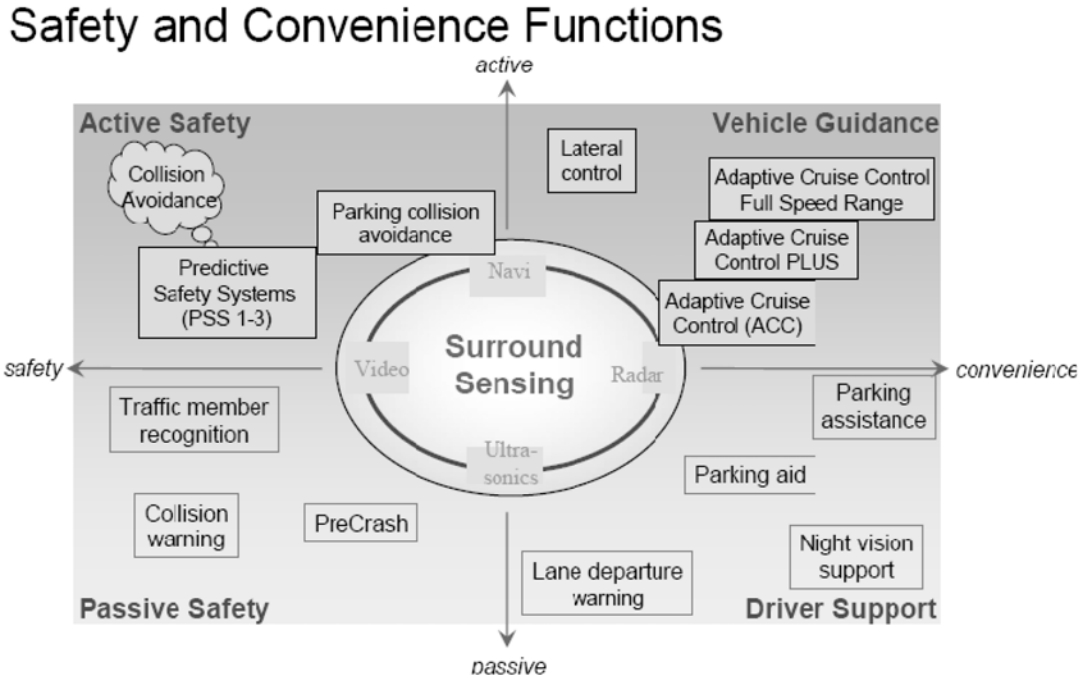
	HEV	PHEV	EV	FCEV
GM	●	●		
VW	●	○	○	△
Toyota	●	●	○	△
Renault/Nissan	●		●	
Hyundai	●	○	○	○
Ford	●	○	○	
Flat/Chrysler			○	
PSA	●	○	●	
Honda	●	○	○	●
Suzuki		○		
Daimler	●		○	○
BMW	●	○	○	

● production stage, ○ production decision stage △ development stage

Source: Fourin

In addition to environmentally friendly technologies, the latest focuses for the automotive industry are safety and convenience. Advances in automotive electronics video, sensor, radar, navigation, and telecommunication) offer the promise of safer and more convenient driving.

General safety technologies can be divided into three categories. Active automotive systems refer to technologies that help avoid collisions and passive automotive safety systems refer to components of the vehicle that protect the occupants during a crash. Lastly, convenience technologies are related to vehicle guidance systems (adaptive cruise control) or drive support (night vision support).



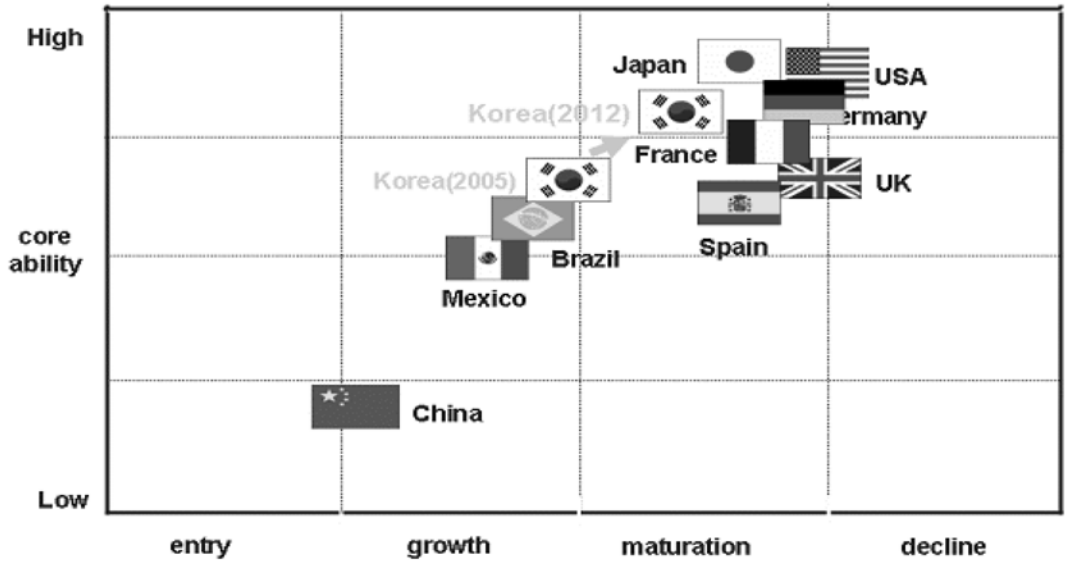
⑥ The Spread of Production Technology

Countries with developed markets such as Japan, Germany, and USA are leading manufacturers of automobiles with advanced technology including hybrid electric vehicles, fuel cell electric vehicles, and intelligent vehicles. The Korean automotive industry can be regarded on the same technological level with these countries in terms of product and engine development. To further develop advanced technologies, Korean automotive manufacturers are investing more in R&D.

Automotive manufacturing technology is being spread worldwide. Developing countries also have automobile assembly lines. They also have the manufacturing ability for general components of automobiles. Developing countries including China and India assemble and export auto components. Such developing industries are rapidly growing through adapting the automotive assembly process and other advanced manufacturing technologies.

On the other hand, while the automotive industries of developed countries have reached maturity they still have a competitive edge in that they possess all the core technology. Such matured automobile companies establish assembly and manufacturing units in developing countries such as China and India. Although these developing countries are striving to acquire core technologies, developed countries are unwilling to share their professional knowledge in product development technology, design technology, and advanced technology.

Figure 4-1-3. Status of Major Countries in Automotive Industry



Source: KIET (2008)

4-1-2. The Development of Indonesia's Automotive Industry

① Indonesia's Automotive Production Status

Indonesia is fast becoming a major international player in the automotive industry. The average annual growth rate of automobile production during 2006-2011 was 23.1%.

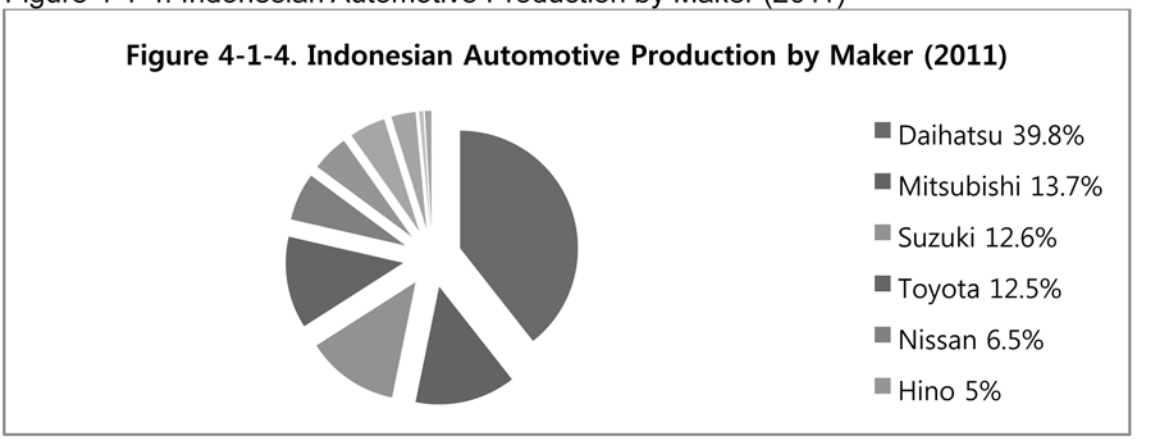
Regarding the type of cars, 63.3% of total automobile production was non-sedan cars (family mini-vans) which have an engine displacement below 1.5ℓ. While SUVs contributed to a very small portion of automobile production in Indonesia, it had the fastest growth rate.

Table 4-1-5. Breakdown of Indonesian Automotive Production

	2006	2007	2008	2009	2010	2011	Increase Rate 2006~2011	Share
Sedans	2,008	1,570	5,293	2,367	4,081	3,231	10.0%	0.4%
NonSedan Cars 4x2	203,676	302,334	415,997	346,245	477,252	530,762	21.1%	63.3%
SUVs 4x4	637	5,304	9,503	3,560	15,191	27,870	112.9%	3.3%
(Cars)	206,321	309,208	431,423	352,172	496,524	561,863	22.2%	67.1%
Pickups/ Trucks	88,433	100,754	166,249	110,316	201,878	271,943	25.2%	32.5%
Bus	1,215	1,676	2,956	2,328	4,106	4,142	27.0%	0.5%
(Commercial Vehicles)	89,687	102,430	169,205	112,644	205,984	276,085	25.2%	32.9%
Total	296,008	411,638	600,628	474,816	702,508	837,948	23.1%	100.0%

99% of Indonesia's total vehicle production is dependent on Japanese carmakers. Toyota Group (Toyota and Daihatsu) is the largest producer with its production share reaching over 50% of the total Indonesian automotive production. On the other hand, Hyundai's production is only 0.6%. Recently, Chinese car makers (Geely and Chery) started their automotive production in Indonesia.

Figure 4-1-4. Indonesian Automotive Production by Maker (2011)



Source: Fourin, Asia Automotive Intelligence, 2012. 2

② Indonesian Automobile Sales

In recent years, increasing demand has spurred on a rapid increased in automobile sales. Following an average annual growth rate of 20% over a five-year period, the Indonesian automotive market hit a remarkable milestone in 2011 by achieving a new sales record of 894,164 units. In the first quarter of 2012, domestic vehicle sales were 525,185 units. Regarding the type of vehicles, 63.83% of total automobile sales were non-sedan cars (family mini-bans) which usually have an engine displacement below 1.5ℓ.

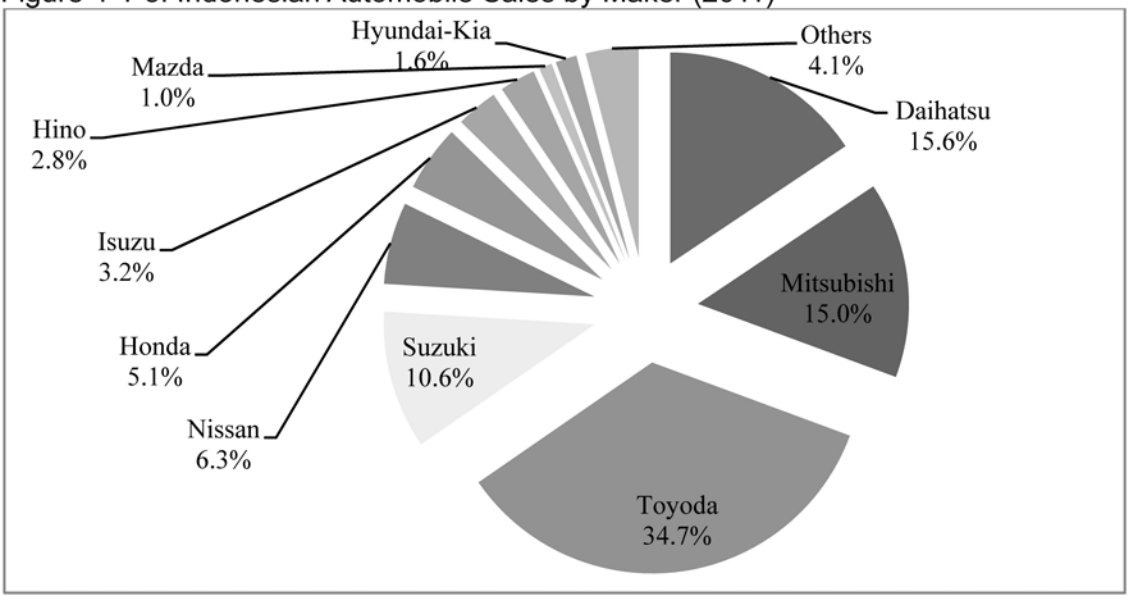
Table 4-1-6. Breakdown of Indonesian Automobile sales

	2006	2007	2008	2009	2010	2011	Increase rate (2006~2011)	share
Sedans	17,565	27,381	34,300	22,100	33,128	25,741	7.9%	2.9%
Non Sedan Cars 4 x 2	203,634	285,733	388,790	335,053	504,510	569,768	22.8%	63.8%
SUVs 4 x 4	1,188	1,655	2,177	2,214	3,837	5,521	36.0%	0.6%
(Cars)	222,387	314,769	425,267	359,367	541,475	601,030	22.0%	67.3%
Pickups/Trucks	94,956	116,872	175,646	121,712	219,058	288,020	24.8%	32.3%
Bus	1,561	1,700	2,861	2,469	4,177	3,853	19.8%	0.4%
(Commercial Vehicles)	96,517	118,572	178,507	124,181	223,235	291,873	24.8%	32.7%
Total	318,904	433,341	603,774	483,548	764,710	892,903	22.9%	100.0%

Source: Fourin, Asia Automotive Intelligence, 2012. 2

In 2011, 94% of the total vehicle sales in Indonesian were made by Japanese carmakers. Toyota accounted for 34.7%, followed by Daihatsu 15.6%, Mitsubishi 15.0%, Suzuki 10.6%, etc. (Figure 4-1-5). Recently, the sales of imported cars are rapidly increasing.

Figure 4-1-5. Indonesian Automobile Sales by Maker (2011)



Source: Fourin, Asia Automotive Intelligence, 2012. 3

③ Indonesia's Automobile Trade

While 60.2% of its imports are from Thailand and Japan, the Indonesian automotive industry has had consistent trade deficits with these two countries.

Table 4-1-7. Trade Trend of the Indonesian Automotive Industry (HS 87)

(Unit: Million Dollars)

Export	2007	2008	2009	2010	2011	Increase Rate (2006~2011)	Share
Total	2,111	2,819	1,958	2,900	3,329	12.1%	100.0%
Thailand	219	351	286	504	466	20.8%	14.0%
Japan	274	384	270	383	452	13.3%	13.6%
Philippines	145	222	253	303	382	27.4%	11.5%
Saudi Arabia	199	272	127	254	379	17.5%	11.4%
Malaysia	157	304	234	293	285	16.1%	8.6%

Import	2007	2008	2009	2010	2011	Increase Rate (2006~2011)	Share
Total	2,779	6,656	3,151	5,737	7,603	28.6%	100.0%
Thailand	974	1,916	1,022	2,032	2,413	25.5%	31.7%
Japan	951	2,763	829	1,714	2,169	22.9%	28.5%
China	160	322	228	367	543	35.9%	7.1%
India	79	148	114	235	420	51.8%	5.5%
U.S.A.	54	254	130	134	346	59.1%	4.6%
Korea	54	69	63	95	137	26.2%	1.8%

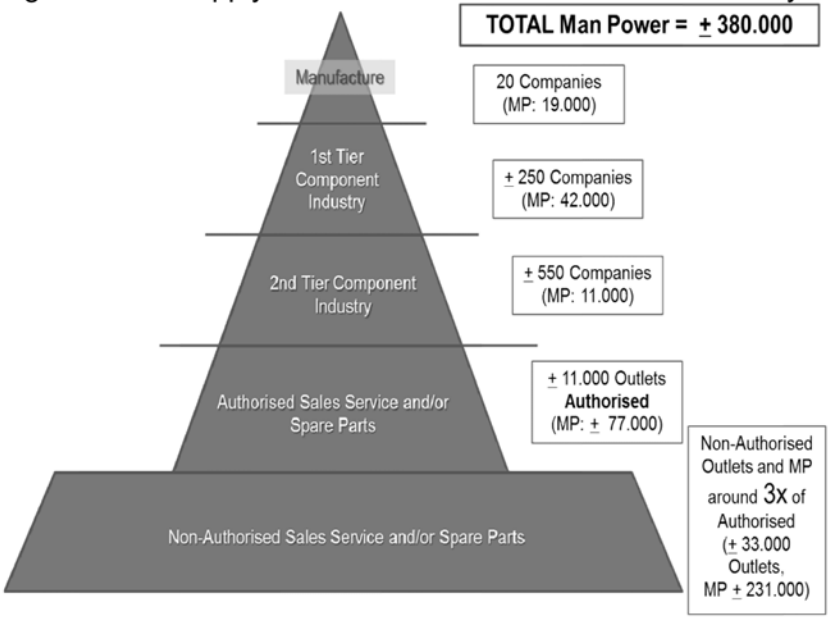
	2007	2008	2009	2010	2011
Balance of Payments	668	3,837	1,193	2,837	4,274

Source: Fourin, Asia Automotive Intelligence, 2012. 7

④ The Supply Chain of the Indonesian Automotive Industry

The percentage of locally produced automobile components is around 75% in Indonesia. 150 to 160 local automotive component firms are first suppliers. However, the core components are usually made by Japanese firms. As part of the government's low cost green car policy, Indonesia hopes to increase the percentage of locally produced components in the make-up of vehicles manufactured.

Figure 4-1-6. Supply Chain of Indonesian Automobile Industry



Source: GAIKINDO (2012)

⑤ Future Prospects for the Indonesian Automotive Industry

Indonesia is the 4th largest country in the world by population, with an average annual GDP growth rate of 5.7% in the last 4 years. Forecasts for the GDP growth in the coming years are generally optimistic and this applies to the automotive industry as well. According to GAIKINDO (2012), the vehicle production will reach 1,610 thousands units in 2015, 2,593 thousands units in 2020, and 4,177 thousands units in 2025. It seems that Indonesian automotive industry will enjoy continuous expansion of production and domestic sales as well as exports for the years to come.

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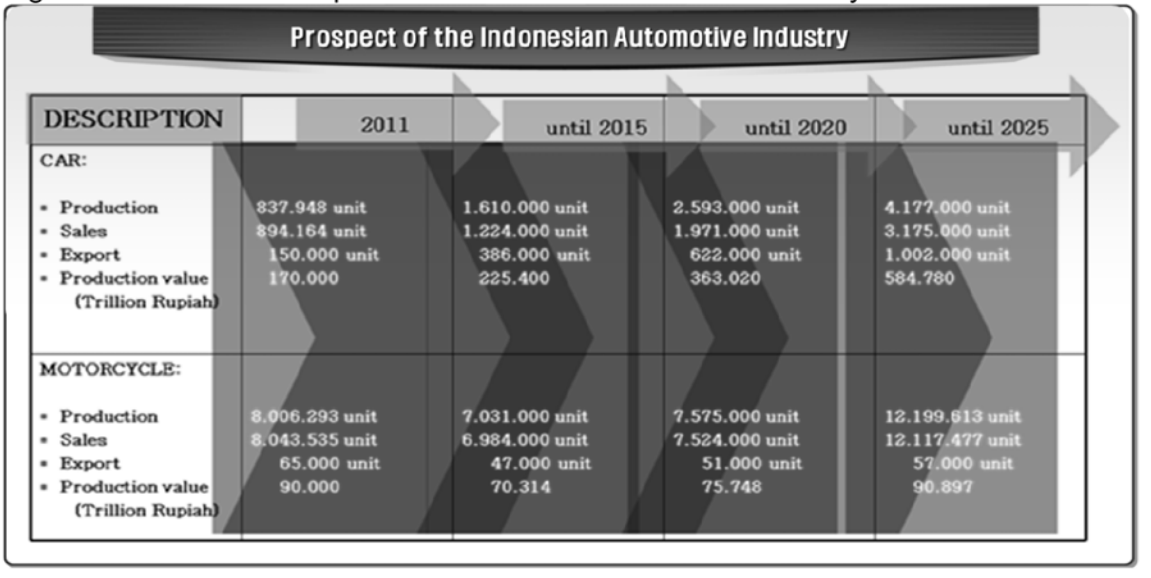
Table 4-1-8 Indonesia Macroeconomic Indicator

NO	INDICATORS	2008	2009	2010	2011	2012 *	2013 *	2014 *	2015 *
1	GDP (%)	6.1	4,2	6,1	6,4	6,7	6,7 – 7,4	7,0 – 7,7	7,0 – 8,0
2	INFLATION (%)	11,1	6,2	6,96	3,79	5,3	3,5 – 5,5	3,5 – 5,5	3,5 – 5,5
3	SBI 3 Month (%)	9,3	7,5	7,0	6,25	6,0	5,0 – 7,0	5,0 – 7,0	5,0 – 7,0
4	EX. RATE IDR/USD	9,691	9,400	8,900	8,700	8.800	8,800 – 9,200	8,000 – 9,200	8,900 – 9,300
5	OIL PRICE (USD/Barrel)	97,0	80,0	85,0	95,0	90,0	80 - 100	80 – 100	80 – 100

Source: GAIKINDO (2012)

Figure 4-1-7. Future Prospects for Indonesian Automotive Industry

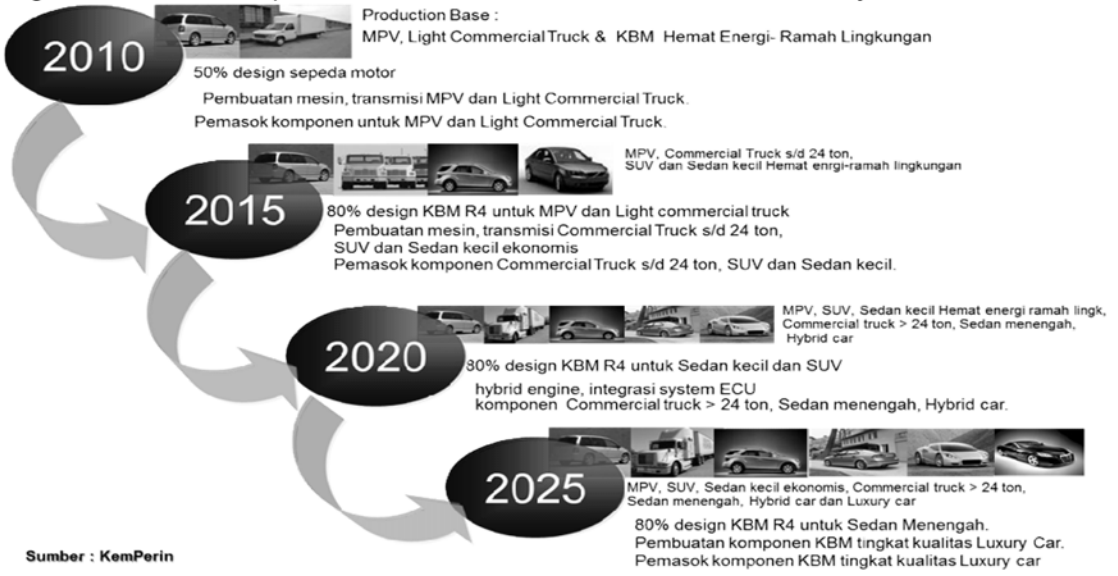


Source: Sasaran KUANTITATIF Jangka Panjang 2025

⑥ Development Plan of Indonesian Automotive Industry

The Indonesian government has listed the automotive sector as one of the country's five priority industries and is planning a project aimed at fostering it. It hopes to possess hybrid engine technology and engine system ECU technology by 2020. The government is providing investment incentives in the form of corporate tax reduction and exemption of import duty for importation of production machinery, equipment and raw materials

Figure 4-1-8. Development Plan of Indonesian Automobile Industry



Source: GAIKINDO (2012)

In 2013, the Indonesian government is planning to invest USD 1.5 billion on component industry, which will be accompanied by the establishment of 100 companies by foreign firms from Japan, Taiwan and China. This new investment will increase the number of firms in component industry from 1,400 units to 1,500 units in 2013. This rapid expansion from the 900 units 4 years ago signifies the movement of the Indonesian automotive market to the forefront. It is hoped that this investment in the component industry will be reinforced by increase in R&D investment.

Automotive sales are projected to reach 1 million units in 2013. Furthermore, it is expected to hit 1.5 million units in 2015 or 2016 and 2 million in 2017. Therefore the time is ripe for investing in the automotive and components industry and accordingly it is predicted that until 2014 at least a total of USD 5 billion will be invested in this field.

As a consequence, the amount of imported components will be reduced to a minimum. It is foreseen that Toyota and Honda will make new investments in component amount of imported components will be reduced to a minimum. It is foreseen that Toyota and Honda will make new investments in component production, along with 10 to15 component industries of tier 1 & 2. Marubeni and PT Unipres Indonesia will open its first component production facility in Cikampek, West Java. During the first phase, it will produce monocoque platforms, transmission cases, and undercarriage components. The facility has a capacity of 200,000 units per year and will employ 1,000 workers. It will supply 40,000 units to Nissan as a beginning.

The Central Bureau of Statistics of Indonesia reported that exports of vehicles and components in the first quarter of 2012 were USD 2.34 billion. This was a 47% increase compared to the same period in 2011 (USD 1.59 billion). Import was USD 4.93 billion in the first quarter of 2012, an increase of 45% compared to the same period in 2011 (USD 3.39 billion). The government is also expected to put in place a development plan on the production of low-cost green cars (LCGC) and LC program.

< Low-cost green car plan (concept) >

Engine displacement >1,000cc
Fuel consumption 20 km/l (1,200cc), and 22km/l (1,000cc)
Emission Euro-3
Local content 40% (1stY), 60% (3rdY), 80% (5thY)
New engine design in 3rd year
Price < Rp 100 million (USD 9,000)

< LC Program >

Alleviation of poverty program (early 2011) includes LC program with other 5 programs
Developed by domestic capability
Basic utility vehicle or light truck
Fuel consumption 22km/l
CNG possibility
Engine displacement <1,000cc
Local content 80% in 5 years
Price of less than Rp 60 million (USD 6,000)

4-2. Consumer Electronics

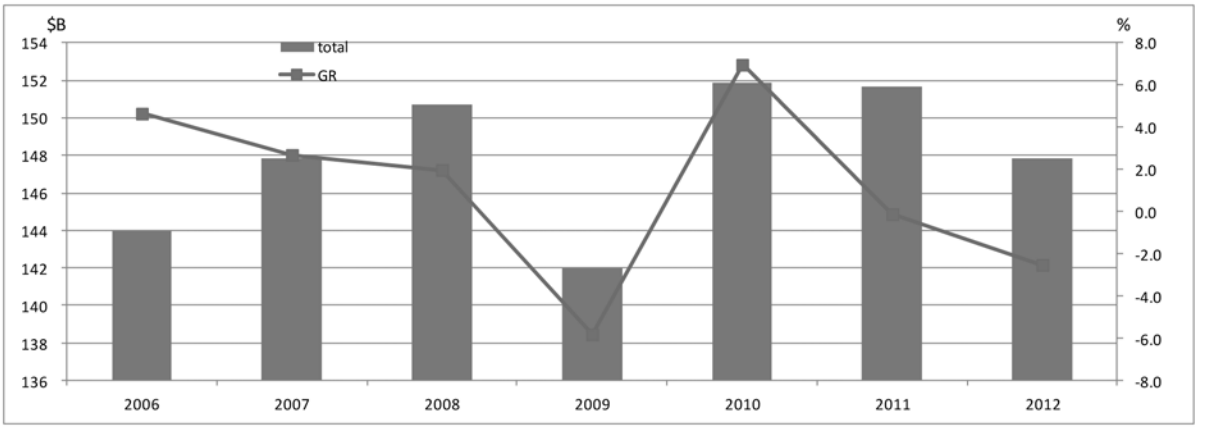
4-2-1 Global Consumer Electronics Industry Overview

① Global Consumer Electronics Market Overview

Electronics industry worldwide is distinguished by rapid technological progress, and has *grown faster than other industry during the last 30 years. The electronics industry is* divided into industrial electronics, consumer electronics and electronic components & parts. Among these sectors, consumer electronics accounted for 7.9% of the world's electronics market, and 8.6% of world electronics production in 2012. Currently, the major growth drivers and trends in consumer electronics are LCD HDTV, smart TV, TV flat panel, digital cameras, set top boxes and smart home appliances.

The world consumer electronics industry is now on the recovery from the 2008/09 financial crisis and the global downturn, which began in the second half of 2009. The global consumer electronics market decreased from USD 151.7 billion in 2011 to USD 147.9 billion in 2012 due to the Euro-zone crisis. Growth in the consumer electronics industry will be influenced by rattled consumer confidence around the world, especially in more mature markets, such as the United States and Western Europe. On the while, emerging markets will show stronger growth boosted by increased consumer spending.

Figure 4-2-1 Global Consumer Electronics Market Trend

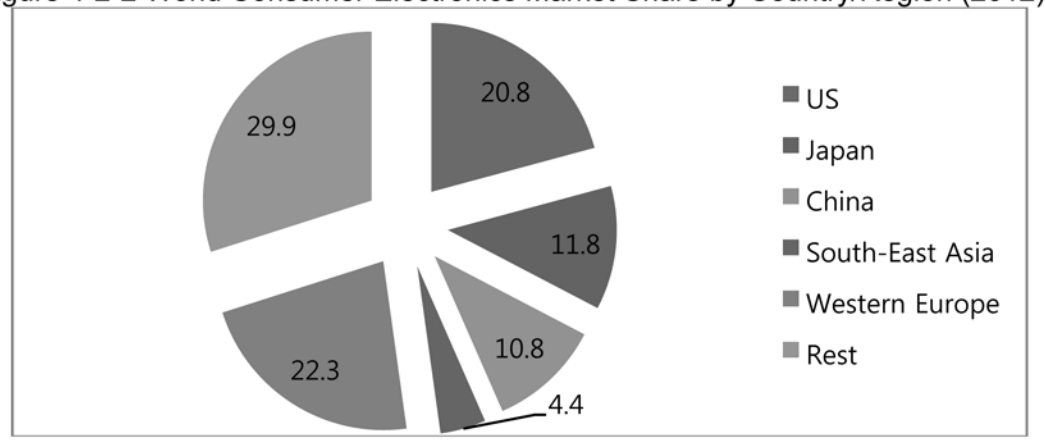


Source: Reed Electronics Research (2012), *The Yearbook of World Electronics Data 2012/2013.*

Notes: the growth rate in 2012 is estimated

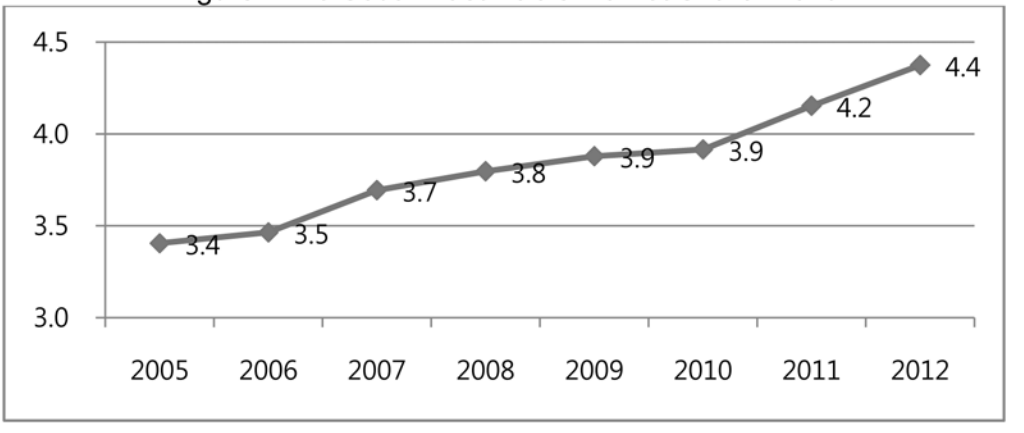
U.S is the leading market region in the world consumer electronics industry with 20.8% share in 2012. Japan is the second largest market with a market share of 11.8%. China is the third largest market with a market share of 10.8%. South-East Asia (Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam) accounts for 4.4% in 2012 rising from 3.4% in 2005, supported by continued economic growth.

Figure 4-2-2 World Consumer Electronics Market Share by Country/Region (2012)



Source: Reed Electronics Research (2012), *The Yearbook of World Electronics Data 2012/2013*.

Figure 4-2-3 South-East Asia's Market Share Trend



Thailand is the largest country in the South-East Asian consumer electronics market with a 22.6% share in 2012. Indonesia is the second-largest market with a share of 22.3% from 21.7% in 2005. Singapore records third with a share of 21.9%. These three major countries of Thailand, Indonesia, and Singapore account for 67% of the South-East Asian consumer electronics market.

Table 4-2-1 Share by Country in South-East Asia Market

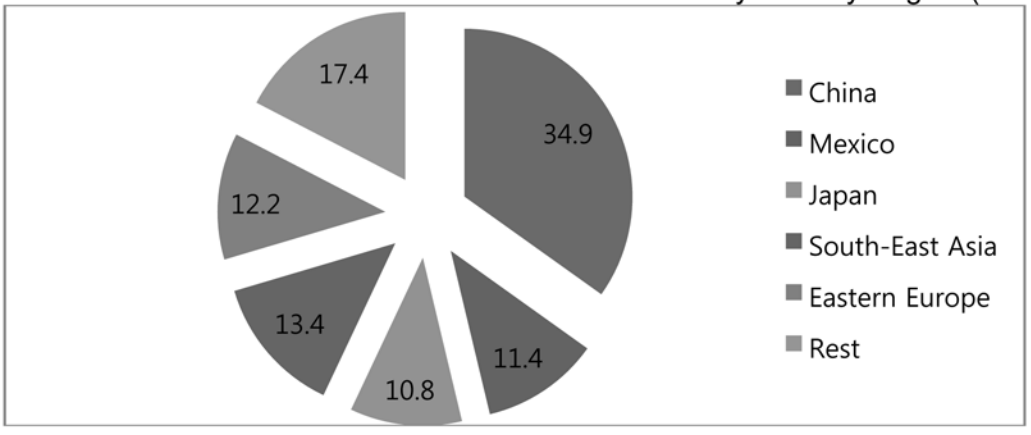
	2005	2012	change(%p)
Indonesia	21.7	22.3	0.6
Malaysia	13.3	13.6	0.3
Philippines	8.4	7.0	-1.4
Singapore	25.7	21.9	-3.8
Thailand	18.7	22.6	3.9
Vietnam	12.1	12.5	0.4

Source: Reed Electronics Research (2012), *The Yearbook of World Electronics Data 2012/2013.*

② Global Consumer Electronics Production Overview

China dominates the global consumer electronics production, accounting for 34.9% of total world production in 2012. Foreign companies including Taiwanese companies preferred China as the production base because of its cheap labor cost and vast consumer market. Local manufacturers strengthened domestic production to meet rising local market needs. The second is Mexico with a share of 11.4% and the third is Japan, accounting for 10.8%. The three major consumer electronics producing countries accounted for 57.1% of the total output in 2012, which is expected to rise continuously.

Figure 4-2-4 Global Consumer Electronics Production Share by Country/Region (2012)

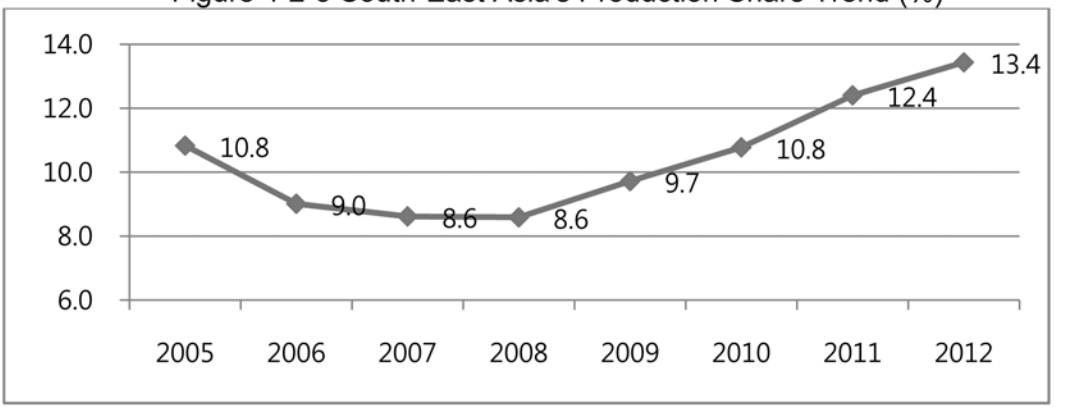


Source: Reed Electronics Research (2012), *The Yearbook of World Electronics Data 2012/2013.*

South-East Asia is playing an increasingly important role in consumer electronics production, with a market share increase from 8.6% in 2007 to 13.4% in 2012. Malaysia and

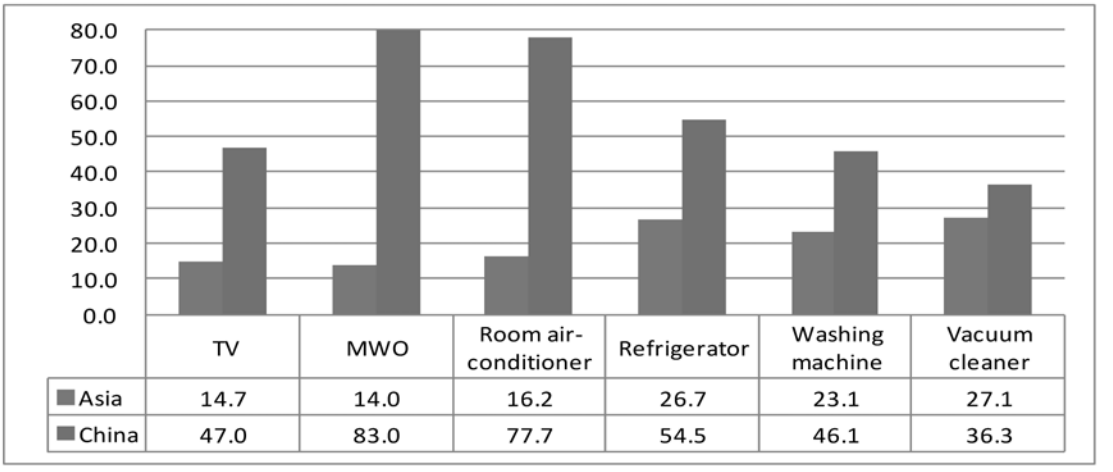
Thailand accounted for 6.5% and 2.9% respectively of world consumer electronics production in 2012. The share of Indonesia rose from 1.7% in 2007 to 3.1% in 2012.

Figure 4-2-5 South-East Asia's Production Share Trend (%)



China and other Asian countries produce 60-90% of major appliances such as TVs, microwaves, room air-conditioners, refrigerators, washing machines, and vacuum cleaners. In particular, China's share of global production of microwaves and room air-conditioners reached 80%. Also, more than 40% of TVs, refrigerators, washing machines, and vacuum cleaners are made in China. Asian countries (excluding China and Japan) account for more than 20% of the world's total refrigerators, washing machines and cleaning appliance production.

Figure 4-2-6 Major Appliance Production Share by Country (2012)



	TV	MWO	Room air-conditioner	Refrigerator	Washing machine	Vacuum cleaner
Asia	14.7	14.0	16.2	26.7	23.1	27.1
China	47.0	83.0	77.7	54.5	46.1	36.3

Source: Fuji Chimera Research Institute, *2013 Worldwide Electronics Market Report*, 2013.3.

③ Global TV Market

Global TV shipments fell by over 5.8% in 2012, from 249 million in 2011 to 233 million units. Economic recession in Japan and Europe, and very mildly declined prices compared to the previous year were the main reasons for decreasing demand.

By technology type, LCD TVs with advanced features such as LED backlights, high frame rate, smart function and 3D dominated the global TV market, with over 87% of total TV shipments. LCD TVs are projected to peak around 97% of overall unit demand in 2015. The emerging market is dominated by CRTs (53%), but LCD TVs (54%) dominate in mature markets.

By service type, 27% of worldwide TVs shipments had internet connectivity (smart TVs) in the first quarter of 2012. Smart TV penetration of TVs shipments by country is as follows: Japan has the highest penetration with 46% followed by Western Europe 36%, China 32%, and Asia Pacific 15%. OLED TVs are likely to be launched a little later in the year.

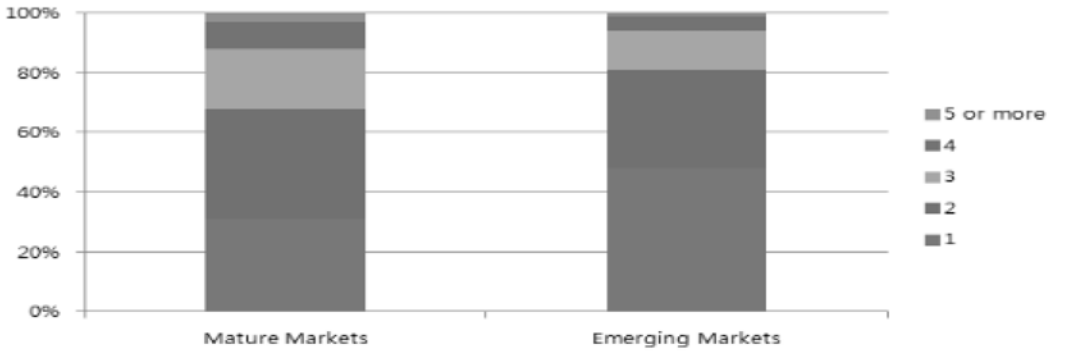
Table 4-2-2 Worldwide TV Shipments by Technology (2012)

Technology	Units	Shares (%)
LCD TV	203,202	87.4
PDP TV	13,350	5.7
CRT TV	16,065	6.9

Source: Displaysearch

Households in mature markets own an average of 2.4 TVs each, and in emerging markets, the average is 1.8 TVs per household. Emerging markets (Russia, Turkey, China, India, Indonesia, Brazil, and Mexico) will drive future TV demand due to increasing demand for flat panel TVs. Increased availability and consumer desire for better quality, larger screens, and HDTV sets contribute to the expansion of the flat- panel TV market.

Figure 4-2-7 TVs per Household (2011)

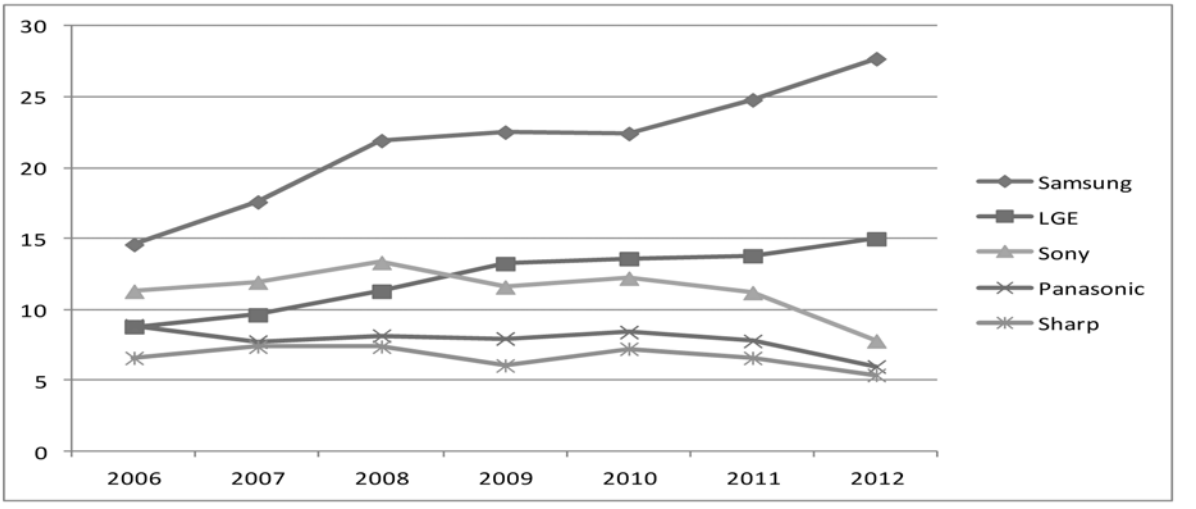


Source: Displaysearch

Samsung's global flat-panel TV revenue share reached a new high, growing to more than 28% and leading all other flat-panel TV makers by a significant margin in 2012. The second brand is LGE with a share of 15%. The top three Japanese brands—Sony, Panasonic, and sharp—were severely impacted by the drop in demand in Japan. The top five accounts for 62% of flat-panel TV shipments.

Figure 4-2-8 Worldwide Flat Panel TV Brand Share Trend

Unit: %



Source: Displaysearch

④ Global Home Appliances Market

Worldwide major home appliance shipments (MWO, room air-conditioner, refrigerator, washing machine, and vacuum cleaner) totaled 479 million units in 2012 increased by 0.8% Y/Y. Room air-conditioners are the largest market with 122 million units. Refrigerators are the second largest market with 106 million units.

Table 4-2-3 Major Home Appliances Market

Unit: 000s

	MWO	Room air-conditioner	Refrigerator	Washing machine	Vacuum cleaner	Total
2011	84,500	119,100	104,930	95,270	71,150	474,950
2012	83,930	121,940	106,180	96,910	69,900	478,860

Source: Fuji Chimera Research Institute, *2013 Worldwide Electronics Market Report,* 2013.3.

Whirlpool Corporation is the world's largest manufacturer of home appliances with a global revenue share of around 11%. Electrolux and Haler are the world's second and third-largest household appliance makers accounting for 7% of global revenue respectively.

Home appliances are evolving into smart appliances with internet connectivity. A smart home system offers convenience and efficiency through smart features such as smart grid, smart diagnosis, smart access, and smart adapt. Smart grid can be made to automatically run energy-intensive appliances at cheaper rates.

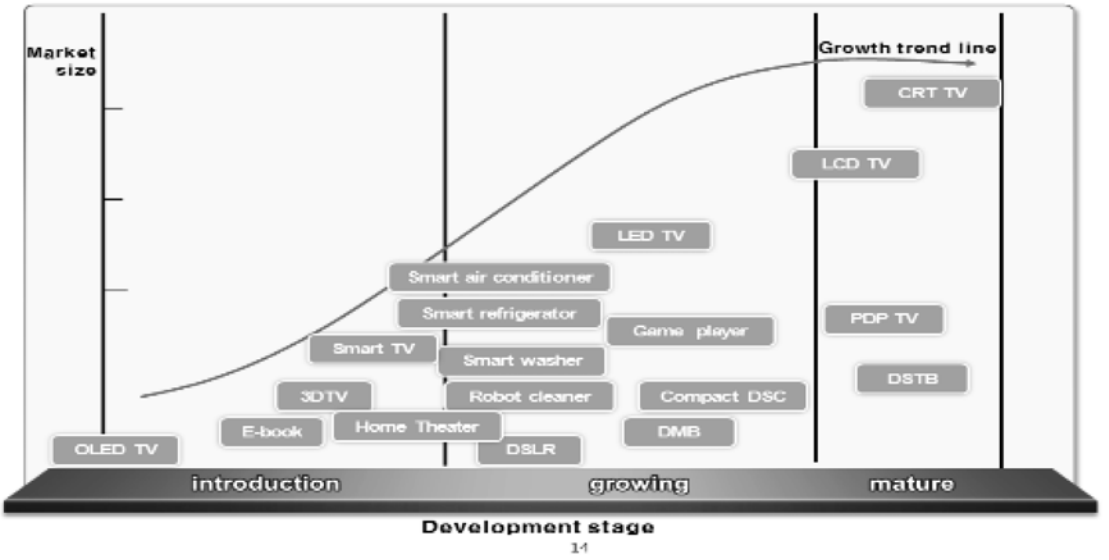
Table 4-2-4 Leading Home Appliances Makers

Maker	Ranking		2010	
	2008	2009	Ranking	MS(%)
Whirlpool	1	1	1	10.5
Electrolux	2	2	2	7.3
Haier	4	3	3	6.9
Simens	3	4	4	5.8
LG	5	5	5	5.1
Midea	10	9	6	3.5
Samsung	8	8	7	3.4

Source: Euromonitor

By stage of consumer electronics development, OLED TV, e-book, smart TV and 3DTV are in the introduction phase. LED TV, robot cleaner, DSLR and smart home appliances are in the growth phase. In contrast, CRT TV and LCD TV are in a stage of maturity.

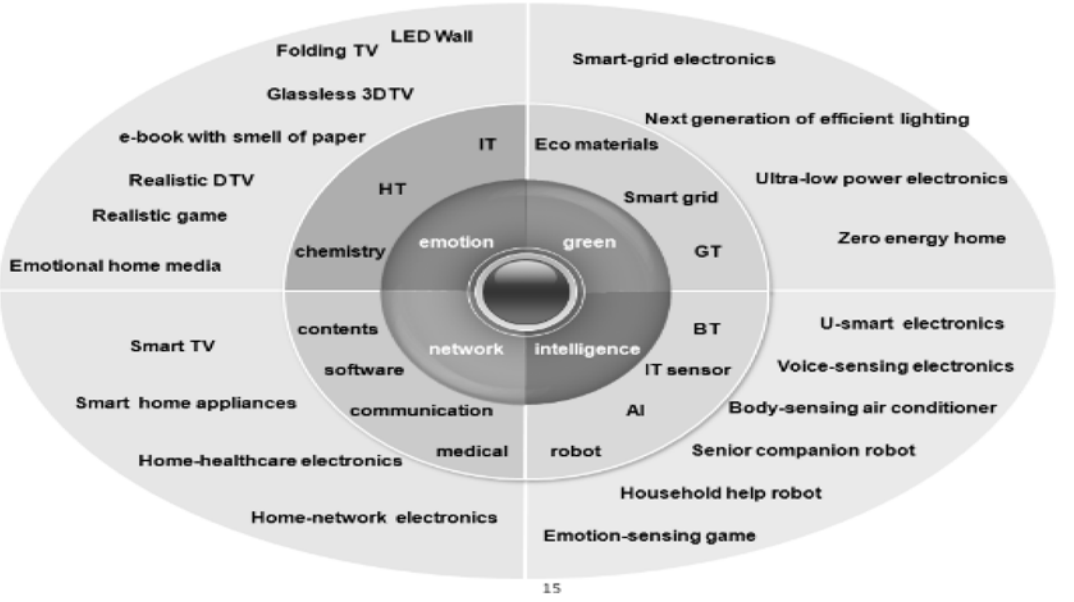
Figure 4-2-9 Stage of Consumer Electronics Development



Source: KIET

In the future, the consumer electronics industry will be developed in the form of a converging industry through linkage with green technology, intelligence technology, network, and emotion technology. Thanks to green technologies such as smart-grid, eco-materials, and energy efficiency technology, ultra-low-power household appliances and high-efficiency lighting will appear. Also, by using intelligence technology, U-smart devices, home appliances with voice recognition function, and the elder assistant robot will be developed. Furthermore, through the combination of wired/wireless telecommunications, contents, software, media and medical, home health-care equipment and home network devices are expected to emerge. 3DTV that can deliver scents to audiences and emotional home media will appear around 2020, by fusing IT, human technology, and nano technology.

Figure 4-2-10 Future of Consumer Electronics



Source: KIET

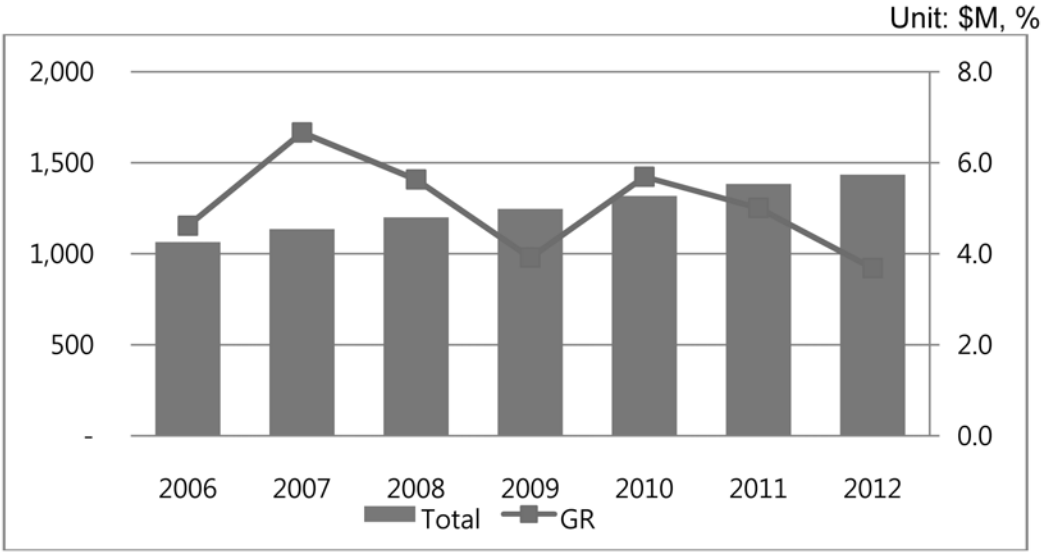
4-2-2. Development of the Indonesian Consumer Electronics Industry

① Outline of the Indonesian Consumer Electronics Industry

The Indonesian consumer electronics market increased from USD 1,065 million in 2006 to USD 1,435 million in 2012, at a compound annual growth rate of 5.1%. In 2012, the consumer electronics market increased by approximately 3.7%, thanks to strong growth in the television market. The TV market accounted for 57.8% of the total consumer electronics market and increased by 4.9% in terms of value and 7.5% in terms of volume.

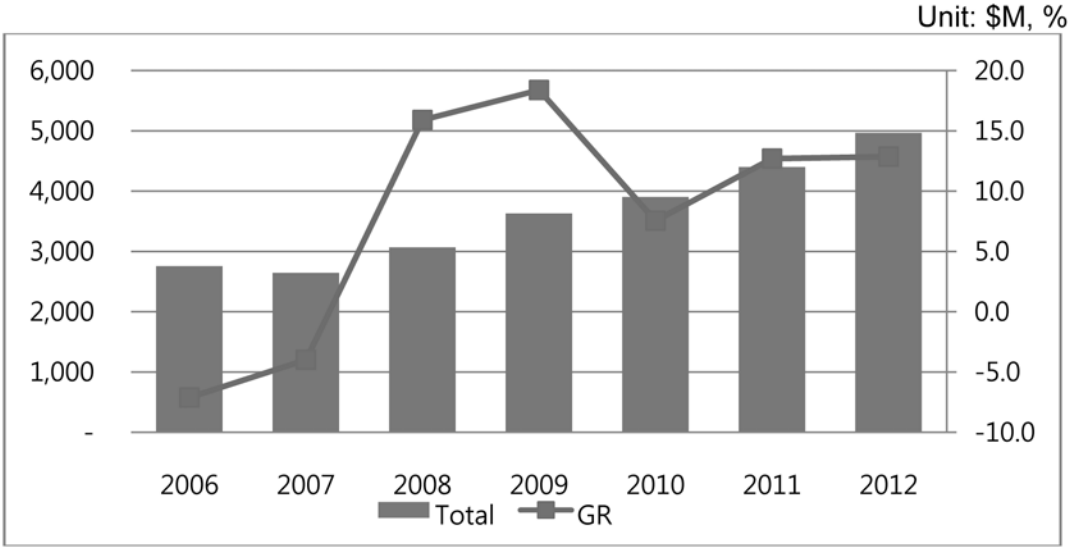
Indonesian consumer electronics production increased from USD 2,760 million in 2006 to USD 4,970 million in 2012, at a compound annual growth rate of 10.3%. In 2012, the consumer electronics production increased by an estimated 12.9%. The size of domestic production was more than three times that of domestic consumption. TV production accounted for 33.4% of total consumer electronics production and increased by 20.0% in terms of value and 22.4% in terms of volume.

Figure 4-2-11 Indonesian Consumer Electronics Market Trend and Growth Rate



Source: Reed Electronics Research (2012), *The Yearbook of World Electronics Data 2012/2013.*

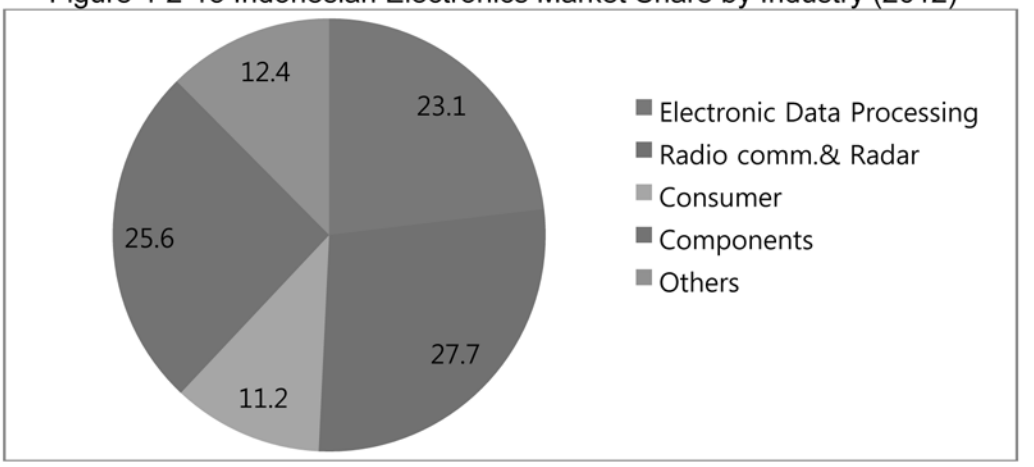
Figure 4-2-12 Indonesian Consumer Electronics Production Trend and Growth Rate



Source: Reed Electronics Research (2012), *The Yearbook of World Electronics Data 2012/2013.*

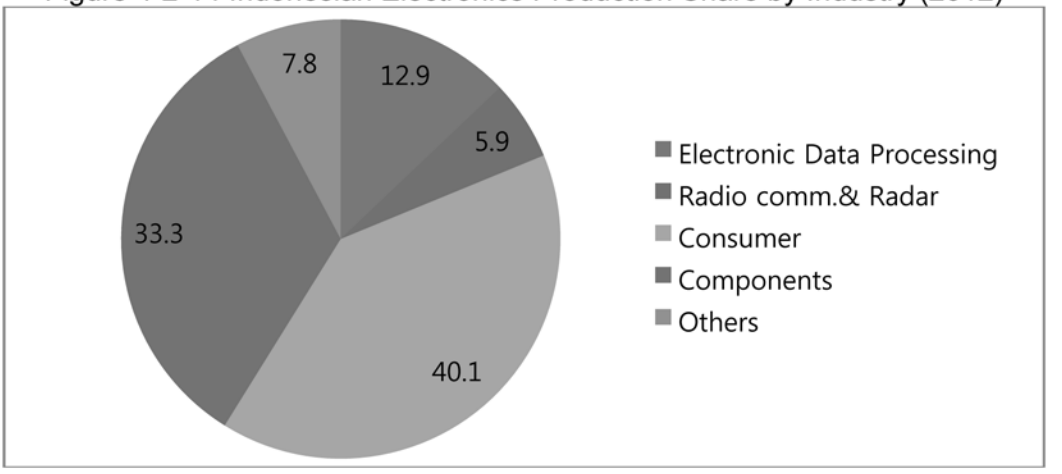
ndonesian consumer electronics account for 11.2% of the total Indonesian electronics market, and 40.1% of total Indonesian electronics production. Also, the Indonesian consumer electronics industry shows export-oriented features with large trade surplus.

Figure 4-2-13 Indonesian Electronics Market Share by Industry (2012)



Source: Reed Electronics Research (2012), *The Yearbook of World Electronics Data 2012/2013.*

Figure 4-2-14 Indonesian Electronics Production Share by Industry (2012)

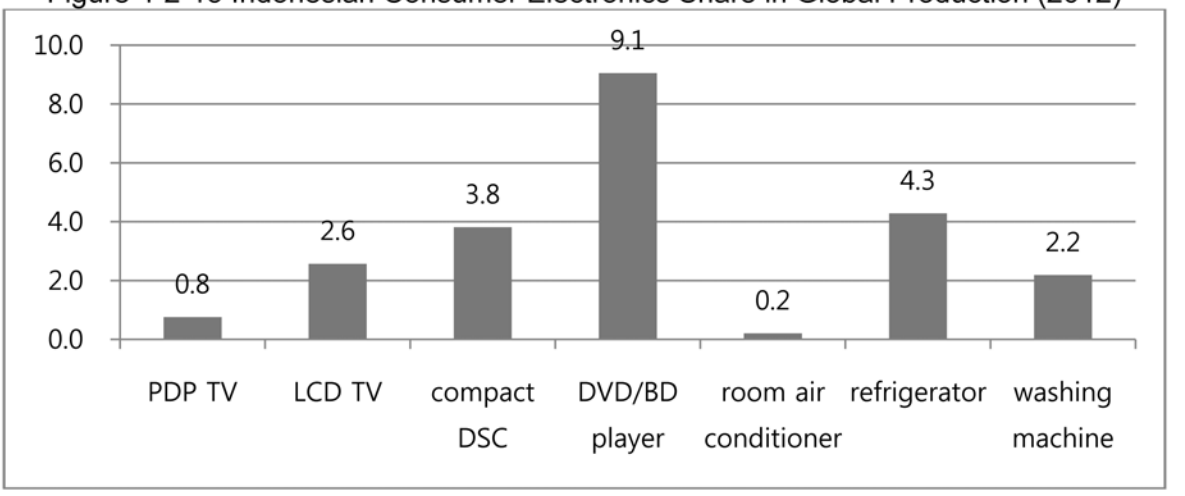


Source: Reed Electronics Research (2012), *The Yearbook of World Electronics Data 2012/2013.*

The share of Indonesian consumer electronics production in the global market increased from 1.7% in 2007 to 3.1% in 2012. The current global ranking of Indonesia has risen from 16th in 2007 to 6th and Indonesia is now emerging as a major country of global production. Share by product is LCD TVs 2.6%, DVD/BD players 9.1%, refrigerators 4.3%, and washing machines 2.2%.

The Indonesia's consumer electronics market relies heavily on foreign manufacturers. Global electronics companies (LG Electronics, Samsung, Panasonic, Sharp, and Toshiba) account for 50-90% of the domestic production.

Figure 4-2-15 Indonesian Consumer Electronics Share in Global Production (2012)



Source: Fuji Chimera Research Institute, *2013 Worldwide Electronics Market Report*, 2013.3.

Table 4-2-5 Global Maker Production in Indonesia (2012)

	LGE	Samsung	Panasonic	Toshiba	Sharp	Total
PDP TV	50	50				100
LCD TV	1,400	700		3,500		5,600
compact DSC			3,800			3,800
DVD/BD player	3,700	5,500				9,200
room air conditioner			150			150
refrigerator	2,050		500		1,500	4,050
Washing Machine			200	1,000	600	1,800

Source: Fuji Chimera Research Institute, *2013 Worldwide Electronics Market Report*, 2013.3.

② Potential and Challenges of the Indonesian Consumer Electronics Industry

Indonesia has enough potential to develop their consumer electronics industry through the following ways: rapid growth of domestic markets, large domestic market to be able to realize economies of scale, fast growing GDP, strong export performance, robust production facilities established by global maker, a large pool of human resources (productive age), and cheap labor cost compared with neighboring South-east Asian countries

However, Indonesia faces many challenges to overcome. First, there are no policies that integrate the development of the consumer electronics industry with systematization and

consistency. Second, the competitiveness and technology of Indonesian electronics components industry are weak due to poor research and development spending on electronics (0.2% of GDP on R&D) and low level of innovation. Third, there is a shortage of skilled labor force due to low level of educational attainment. Within the 20-29 age group, the share of labor force with a university degree is only 4%. On the while, the share of labor force with a junior high school education or below is around 70%.

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Table 4-2-6 Purchase of A/V Electronics by Country (2011)

	GDP per capita($)	purchase per capita($)
Singapore	50,078	295
Malaysia	9,977	29
Thailand	4,971	20
Indonesia	3,495	6
Philippines	2,370	5
Vietnam	1,392	9

Source: Reed Electronics Research (2012), *The Yearbook of World Electronics Data 2012/2013.*
IMF, *International Financial Statistics.*

Forth, the quality of Indonesia's physical infrastructure is very low. The 2010 *World Economic Forum Global Competitiveness Report* ranked Indonesia 96th among 133 countries on infrastructure. Indonesia has poor transport network and an inadequate electricity supply. Fifth, there are numerous social structural problems. Because Indonesian banks tend to avoid risk, it is very difficult for companies to get enough funds. Also, the lack of entrepreneurial spirit to start businesses, and heavy bureaucracy of central and local governments act as barriers in the electronic industry.

Table 4-2-7 Share of Labor Force by Educational Attainment

	Junior High School or below	General High School	Vocational High School	College	University
Men	69.4	16.2	8.2	2.2	4.1
Women	72.4	13.2	5.9	4.1	4.5

Source: BPS, *Indonesia Demographic and Health Survey 2008.*
Note: age group is 20-29

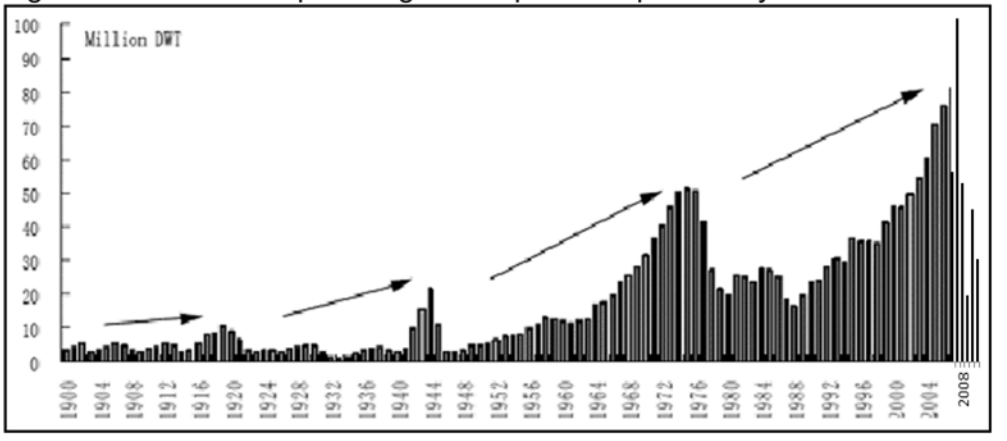
4-3. Shipbuilding

4-3-1. World Shipbuilding Industry Trends and Prospect

The shipbuilding industry typically undergoes cycles. Till the present, the world shipbuilding industry has experienced four cycles. The peaks in the 1910s and the 1940s can be explained by WWI and WWII respectively. The unprecedented peak in 1975 was due to the closing of the Suez Canal but it was soon followed by a collapse in demand caused by the oil crisis of 1973 and the industrial crisis that ensued.

In recent years, the cycle has reached a fourth boom. This cycle can be attributed to the increase in demand for bulkers caused by China's import of iron ore and coal, and the increase in demand for tankers as a result of IMO regulation for single hull tankers. However, this new cycle has declined rapidly since the latter half of 2008, because of the global financial crisis and adjustment pressure in the industry.

Figure 4-3-1 World Shipbuilding Development of past 100 years



Source: Clarkson & CSERC (2009)

The development of shipbuilding industry has been closely related to increased seaborne trade resulting from industrial and economic expansion, and most countries followed a certain pattern. Initially, when the countries had not reached the level of seaborne trade, they depended upon merchant vessels from other countries. When they needed their own ships according to increased seaborne trade, they purchased new or second-hand ships from developed shipping countries. Second, as seaborne trade expanded and foreign and

domestic ships grew in number, shipyards for repairing were constructed. Third, as technologies for repairing ships were acquired and the need for domestic ships grew, shipyards for building new ships were created. Hence, the steel industry, an upstream sector, grew to meet the new demands of steel required for shipbuilding. It appears that the Indonesian shipbuilding industry has now entered the third stage.

Subsequently, major shipbuilding countries increased their world market share by getting a competitive advantage in low costs. However, increased labor costs have led the countries to search for technologies that can reduce costs and improve productivity. The difficulties stemming from high labor costs and scarcity of skilled workforce eventually made these countries lose their productive edge and price competitiveness. As they lost their competitive advantages and market share, these countries had no choice but to depend upon financial support and government subsidies.

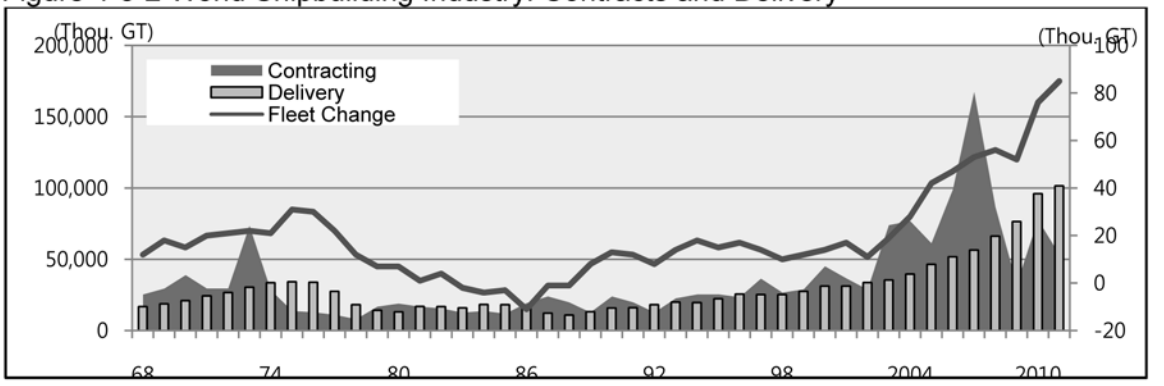
Table 4-3-1 Leadership changes in the shipbuilding industry

	1940s	1950s	1960s-80s	1990s-2000s	2010~
U.K	-Riveting construction -Cost competitive advantages	-Global differentiation -Non-cost competitive advantages	-Subsidization -Shipyard Nationalization	-Facility reduction	
West Europe		-Cost competitive advantages	-Global differentiation -Destructuring	-Global segmentation -Subsidization -Facility Reduction	
Japan		-Government support and protection -Block construction method	-Cost competitive advantages	-Global differentiation -Non-cost competitive advantage	
Korea			-Government support and protection	-Cost competitive advantages -Capacity expansion	-Non-cost competitive advantage -Global differentiation
China				-Government support and protection	-Cost competitive advantages -Capacity expansion

Source: M.E. Poter(1986), *Competition in Global Industries,* S.I. Hong(2008)

Since the global financial crisis, the world shipbuilding industry has undergone significant changes. Shipbuilding orders in 2009 decreased by 92% compared to 2007, when an over-capacity problem came to the fore. On the other hands, in the 2000s, China increased its share in the shipbuilding market from 7% to 35%, and achieved a strong presence especially in simpler ship types.

Figure 4-3-2 World Shipbuilding Industry: Contracts and Delivery

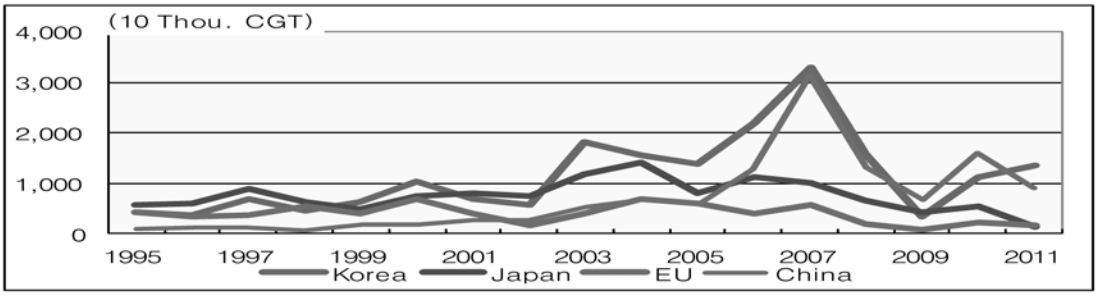


Source: Lloyd (2012), World Shipbuilding Statistics

① The Number of New Contracts and Delivery by Country

In 2000, Korea won the leading position in the world market surpassing Japan and remained on top till 2009. Meanwhile, China became the second largest shipbuilder from 2006 and attained the leading position in 2010. The number of shipbuilding contracts dropped from 41.4 million CGT in 2008 to 30.8 million CGT in 2011 according to Lloyd's. This wane in demand for new ships were caused by the oversupply in many vessel sectors and the decreased availability of finance due to the Euro zone crisis.

Figure 4-3-3 World Shipbuilding Contracting by Country

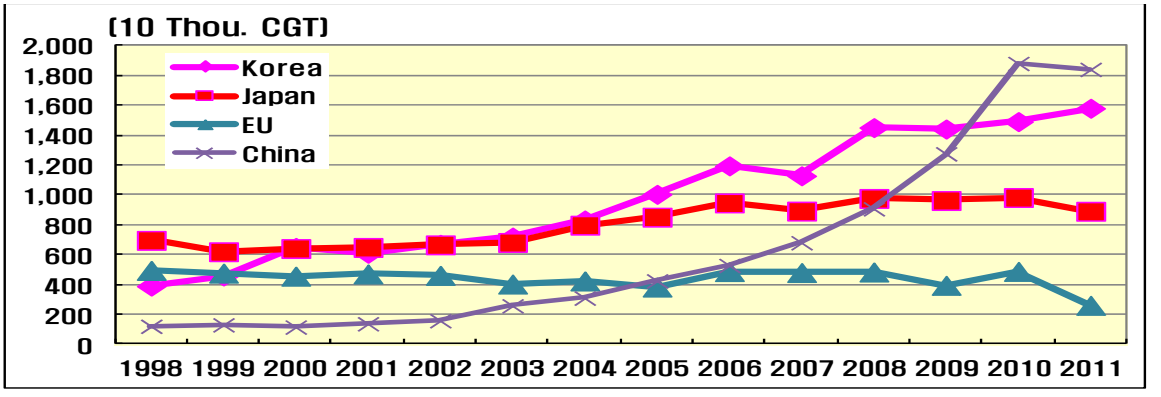


Source: Lloyd (2012), *World Shipbuilding Statistics*

In terms of new order in 2011, Korea attained 43.9% of the market share (13.6 million CGT), and surpassed China. Korea's sophisticated technology and its manufacture of highly valued ships put Korea at an advantage. Meanwhile, China's share was 26.7% (8.2 million CGT), Japan 13.2% (4.1 million CGT), and EU 5.2% (1.6 million CGT)

In terms of delivery in 2011, China achieved 37.6% of the market share, and surpassed Korea. Compared to the data from the year 2000, when China's market share was only 5.7%, the 37.6% market share of the year 2011 is an indication of the substantial growth set in to motion by China's government policy. From 2000 to 2011 the annual growth rate of China's delivery was 29.2% while that of Korea was only 8.4%.

Figure 4-3-4 World Shipbuilding Delivery by Country



Source: Lloyd (2012), World Shipbuilding Statistics

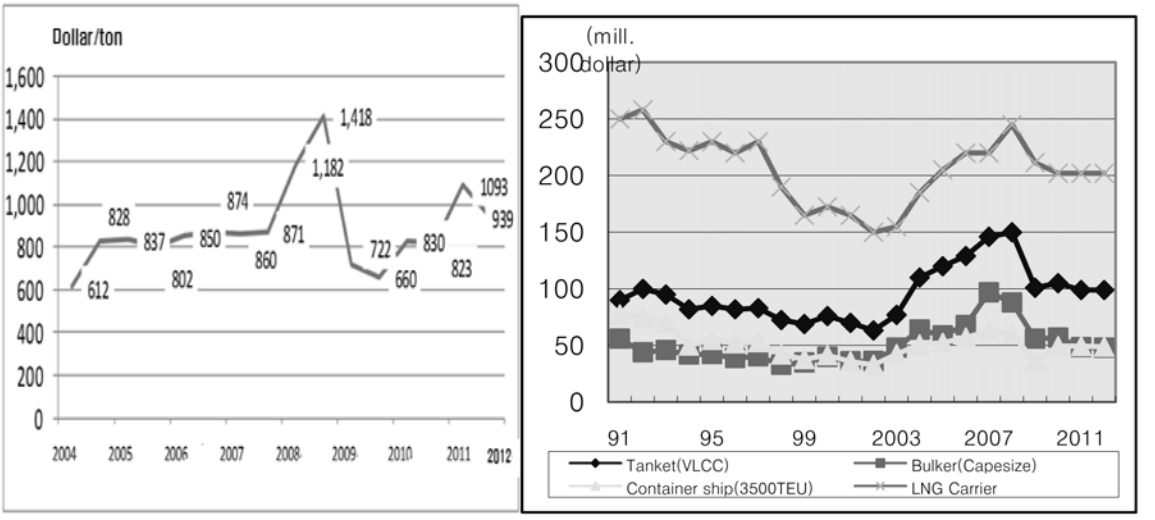
② The Cost of Shipbuilding and Steel Plates

Due to high competition and inelastic supply in the short run, the prices of ships are characteristically unstable. The inelastic supply curve leaves the shipbuilding market no choice but to respond to changes in demand by means of price adjustment rather than output adjustment.

Following the Euro crisis, the manufacturing prices had started to steadily decrease. This is supported by the Clarkson's index of manufacturing prices that has declined from 190 points to 127 points from August 2008 to September 2012. The vessel with the highest percentage decrease was the bulker, down 52.6% (180K), followed by VLCC, down 36.7 %. The 13,000 TEU Container ship was down 34.3 %.

Meanwhile, the price of steel plates had declined due to the reduction of iron ore prices and oversupply of steel plates. The price had gone down to 939 dollar/ton from 1,418 dollar/ton. Materials which can be broken down into steels and equipment take up the largest portion of the cost for shipbuilding. As such, the increase of steel prices can have a detrimental effect on the profit of shipbuilders. For shipbuilders, it is difficult to protect themselves from the unpredictability of steel prices.

Figure 4-3-5 The Cost of Shipbuilding and Steel Plates



Source: Lloyd(2012), World Shipbuilding Statistics

③ Forecast for the Building of New Ships

According to Clarkson research services, the average demand for new ships for the period from 2014 to 2021 is projected to be at 1,694. This is an optimistic forecast, only slightly under the long term average for the annual number of ships contracted during the years 1996-2011. However, as the world economy recently is in a bad shape, with the slow economic growth of developed Western economies and the deterioration of the Euro zone sovereign debt crisis, the short term demand forecast will be slightly pessimistic because of the oversupply for fleet and the contraction of ship finance.

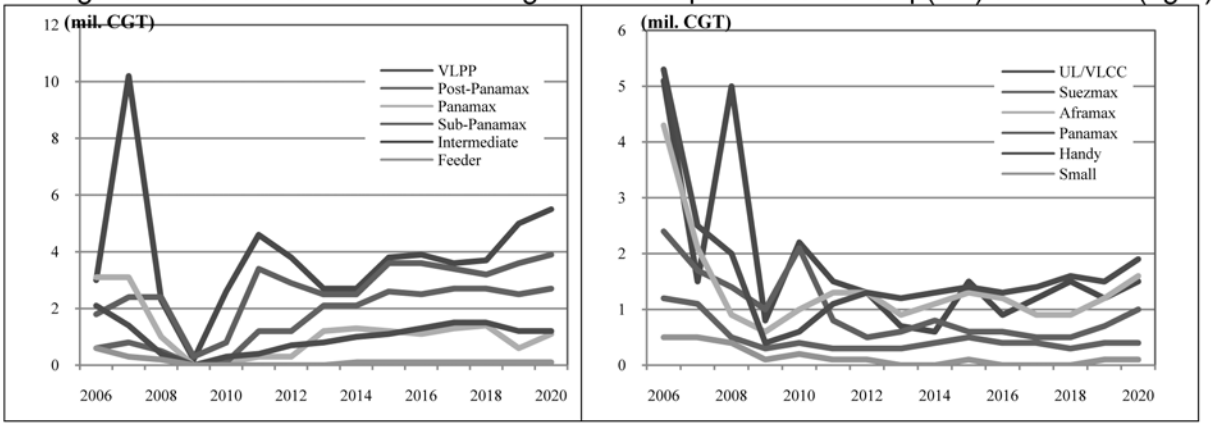
Table 4-3-1 Long-Term New building Demand

	Average Requirement Per Year		
	No. Ships	Mill. GT	Mill. CGT
Avg. 1996-2011	1,911	65.6	36.1
Avg. 2012-2013	1,386	53.4	30.0
Avg. 2014-2021			
Low Case	1,241	48.0	28.4
Base Case	1,694	66.2	38.5
High Case	2,321	87.4	50.9

Source: Clarkson Research Services (2012), *The New building Market 2012-2024*: Forecast Report

Looking at the forecast by vessels, it is predicted that the long-term demand for large sized container ships will grow most strongly. In particular, demand for large container ships of more than 3,000 TEU in capacity is projected to upsurge at a quick rate of 8.2% annually between 2012 and 2024. Meanwhile, demand for tankers is projected to increase 2 to 3% annually from 2012 to 2024. On the other hand, the demand for VLCC is projected to increase at a 3.3% rate over the same period.

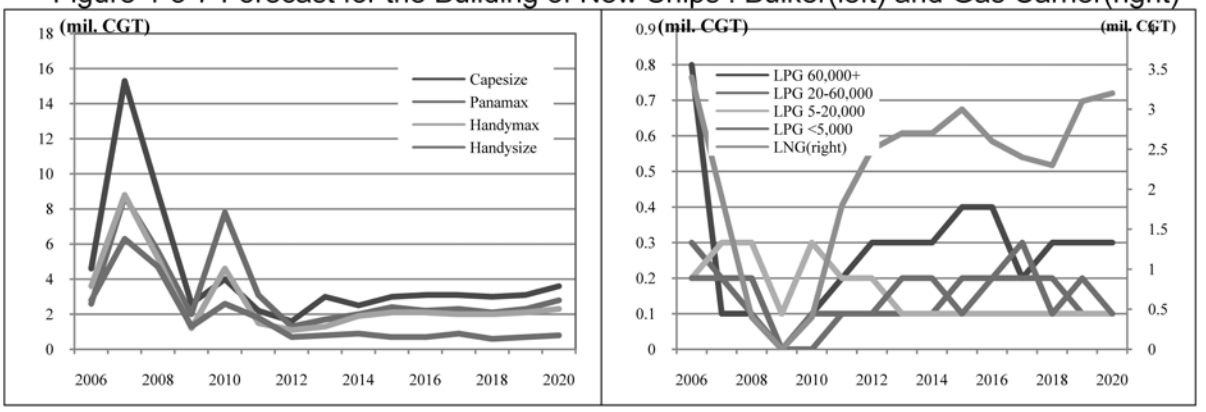
Figure 4-3-6 Forecast for the Building of New Ships: Container ship(left) and Tanker(right)



Source: Clarkson Research Services (2012.3), The New building Market 2012-2024: Forecast Report

Demand for bulkers is projected to increase 2 to 3% annually between 2012 and 2024 similar to tankers. On a more positive note, demand for LNG carriers is foreseen to increase at a rate of 5.2% over the same period.

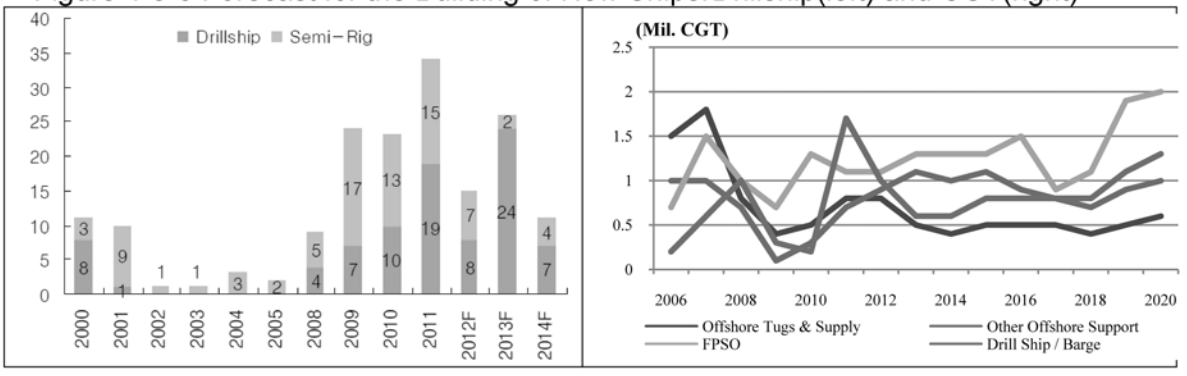
Figure 4-3-7 Forecast for the Building of New Ships : Bulker(left) and Gas Carrier(right)



Source: Clarkson Research Services (2012.3), The New building Market 2012-2024: Forecast Report

Demand for offshore plants is predicted to increase 6 to 7% annually during 2012 and 2024 due to high oil prices. In addition, the increase in demand for offshore plants will be accompanied by a rise in demand for offshore support vessels.

Figure 4-3-8 Forecast for the Building of New Ships: Drillship(left) and OSV(right)



Source: Clarkson Research Services (2012.3), The New building Market 2012-2024: Forecast Report

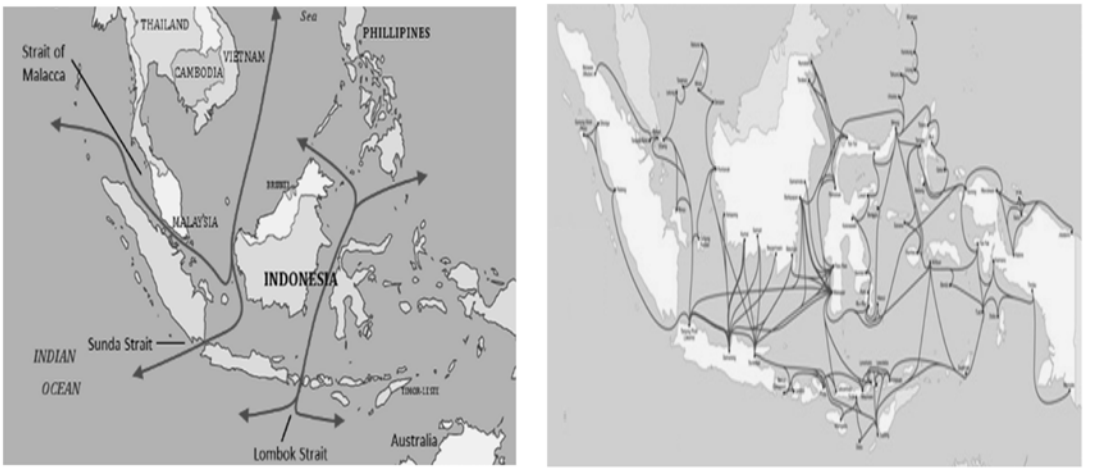
4-3-2. Development Condition of the Indonesian Shipbuilding Industry

① The Geographic Setting of Indonesia

Indonesia is an archipelago that is comprised of 17,508 islands. Therefore its economy is highly dependent on maritime transport for domestic as well as international trade. Furthermore, the total length of the coastal line is 80,000 km and the Strait of Malacca, one of the most important shipping routes, runs long Indonesia's coast. It can be concluded that

Indonesia has a good geographical environment to further develop the shipbuilding industry, both manufacture and repair.

Figure 4-3-9 Indonesian Islands and Shipping Route



Source: http://bpws.go.id

② Status of the Indonesian Shipbuilding Industry

Indonesian shipbuilding enterprises number at 250 companies or so, and they have small shipyards and old facilities. A number of Indonesian government enterprises have been leading the shipbuilding industry. Located in big cities such as Jakarta and Surabaya, they compete with private enterprises for the types and sizes of ships. Many small shipyards are also situated in the Batam Island, which is near Singapore and one of the main ship routes. Therefore there is much demand for ship repair.

The building capacity for new ships in Indonesia is about 499,000 GT a year but there are no shipyards for the manufacture of vessels 50,000 DWT and over. Indonesia's shipbuilding industry is small as can be seen in comparison to the Korean shipbuilding industry which is capable of 35million GT each year and over 200,000 DWT. To aggravate the situation, small Indonesian shipyards in Batam, Karimun and Bintan Islands have outdated technologies and old facilities. Competition with Singapore and Malaysian major shipyards, and competition with foreign companies in Batam, Karimun and Bintan Islands may cause the Indonesian shipbuilding companies to become block suppliers for them.

Figure 4-3-10 Locations of the Indonesian Shipyards

Source: Marwoto Nomo Dihardjo (2012)

Table 4-3-2 Construction and Repair Capacity of the Indonesian Shipbuilding Industry

Range	New Building			Repair		
	Facility (unit)	Production/year (GT)	Production/year (DWT)	Facility(unit)	Production/year (GT)	Production/year (DWT)
< 500	99	23,000	34,500	121	480,000	720,000
501 – 1,000	27	19,000	28,500	45	495,000	742,500
1,001 – 3,000	10	15,500	23,250	25	455,000	682,500
3,001 – 5,000	14	61,500	92,250	6	400,000	600,000
5,001 – 10,000	17	116,000	174,000	7	900,000	1,350,000
10,001 – 50,000	8	264,000	396,000	6	1,270,000	1,905,000
50,001 –100,000	-	---	---	3	1,560,000	2,340,000
>100,000	-	---	---	1	800,000	1,200,000
Total	175	499,000	748,500		6,360,000	9,540,000

Source: Marwoto Nomo Dihardjo (2012

New ship production of the Indonesian shipbuilding industry is still small in scale, but the annual increase rate is very high. Ship repair increased from 2.8 million GT in 2005 to 5.6 million GT in 2008, and the annual increase rate was 26.0%. The shipyards also produce a variety of ships including the bulk carrier (50,000 DWT), trailer vessel, ferry, ro-ro ship (19,000 GT), tanker (3,500 DWT~30,000 DWT), LPG carrier (5,000 cubic feet), passenger vessel (500 PAX), bucket dredger (12.000 ton), trailing suction hopper dredger (1.000 m3), general cargo (3,650 DWT), container vessel (1.600 TEU), ocean going tug boat (7,500 HP), fishing vessel (300 GT), ferry ro-ro (5,000 GT), patrol boat (FPB-57 and FPB-28), etc.

Table 4-3-3 Production of the Indonesian Shipbuilding Industry

(Unit: Thousand GT, %)

PRC	2005	2006	2007	2008	Annual Increase Rate
New Ship	120	200	325	350	42.9
Repair	2,800	4,200	5,200	5,600	26.0

Source: Marwoto Nomo Dihardjo(2012)

Meanwhile, exports increased from 0.7 billion dollars in 2007 to 1.3 billion dollars in 2011 and the annual increase rate was 17.7%. Import was 0.8 billion dollars in 2007 and 2.6 billion dollars in 2011, thus there was always a trade deficit. Till now, the Indonesian shipbuilding industry has exported many types of ships, such as 50,000 DWT bulk carriers, 19,000 GT of trailer vessels, tug boats, and offshore structures for supporting oil and gas industry (platform, jacket, living quarter, supply vessel, etc.)

Registration of Indonesian ships increased from 6.5 million GT in 2000 to 13.7 million GT in 2009. In 2009 alone, 12,436 vessels were registered which is 1.7 times increase over the past 10 years. By vessel type, there were 580,000 GT of passenger and ferry vessels and 1.3 million GT of tanker and general cargo vessels. Also, there were 446,000 GT of bulker and 706,000 GT of container vessels. Vessels older than 25 years comprise 28.1% of the GT base which is an effective indicator of future substitution demand

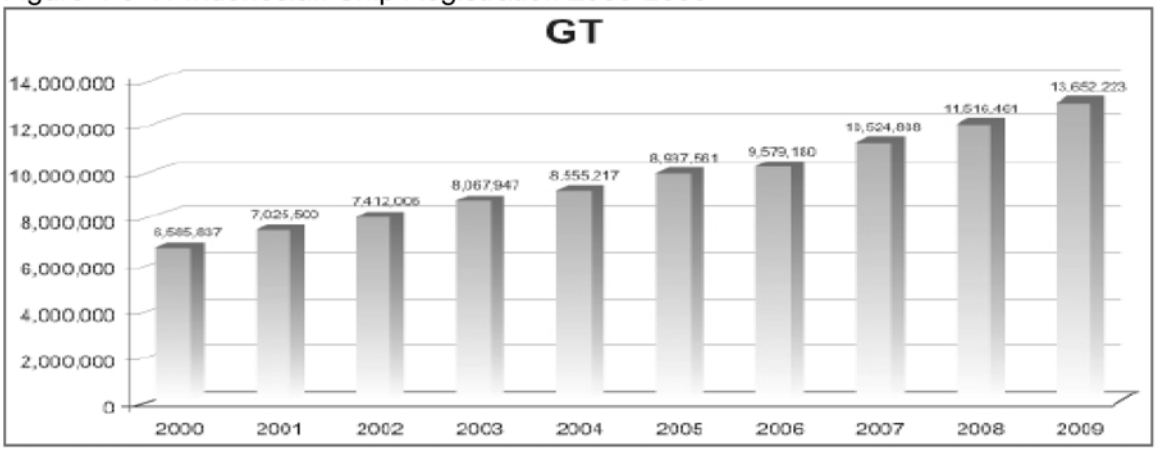
Table 4-3-4 Value of Exports and Imports of the Indonesian Shipbuilding Industry

(Unit: Million dollars, %)

	2007	2008	2009	2010	2011	Annual Increase Rate
Export	669	860	1,146	1,182	1,285	17.7
Import	757	1,995	3,135	2,433	2,617	36.4
Trade Balance	-88	-1,135	-1,989	-1,215	-1,332	97.2

Source: Marwoto Nomo Dihardjo(2012), ibid.

Figure 4-3-11 Indonesian Ship Registration 2000-2009



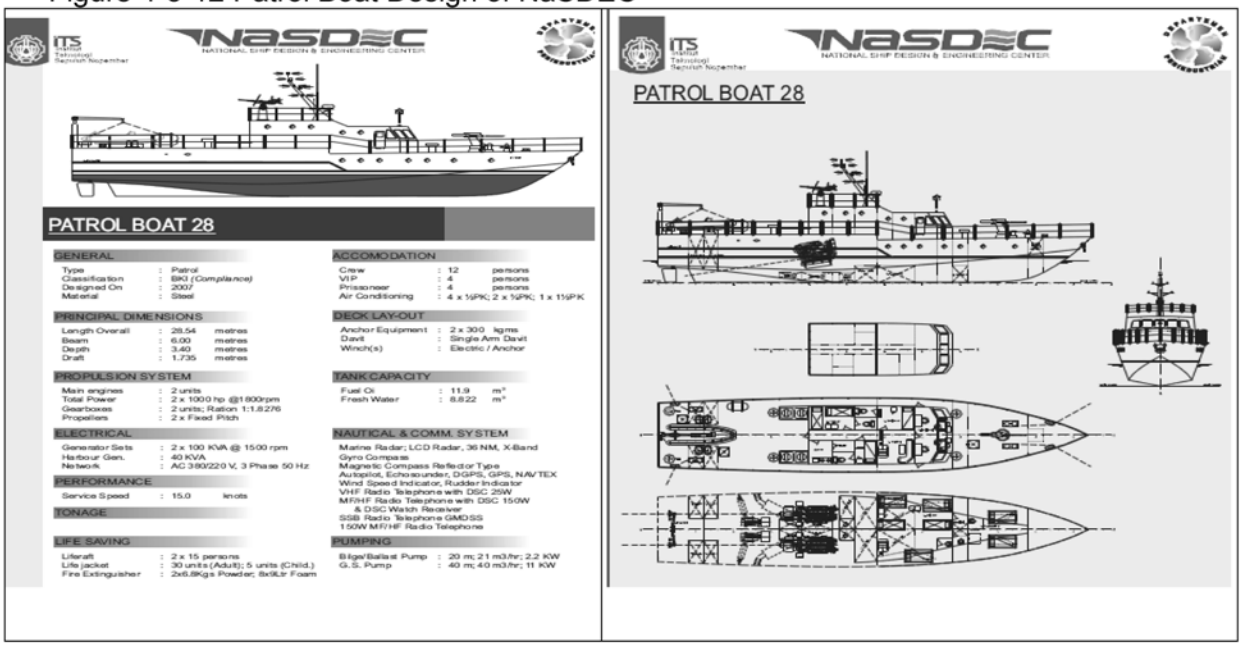
Source: Annual Report BKI 2009, http://www.klasifikasiindonesia.com/

③ Infrastructure for Indonesian shipbuilding industry development

The main governmental infrastructure which supports the Indonesian shipbuilding industry is the NaSDEC (National Ship Design and Engineering Center). It was established in 2006 as a joint project between Institute Teknologi Sepuluh Nopember Surabaya (ITS) and the Ministry of Industry of the Indonesian Government. NaSDEC is a successor of the earlier established Ship Design Office within the Faculty of Marine Technology, ITS Surabaya. NaSDEC is manned by qualified academic staffs from the Faculty of Marine Technology, ITS Surabaya. Its engineers and scientists have years of experience in the field of naval architecture, marine engineering and offshore engineering. It provides comprehensive

project support services from basic to complete design for ferries, passenger vessel, tugs, barges, container ships, tankers, offshore support vessels, FPSO, etc. However its design competency is insufficient for the construction of medium and large sized vessels due to mediocre engineering capabilities, insufficient man power, and lack of facilities. Thus most Indonesian yards outsource their basic design and engineering. Due to this outsourcing, Indonesia is having difficulty estimating the demand for equipment. Furthermore, it is spending a lot of money in purchasing articles according to every individual building situation.

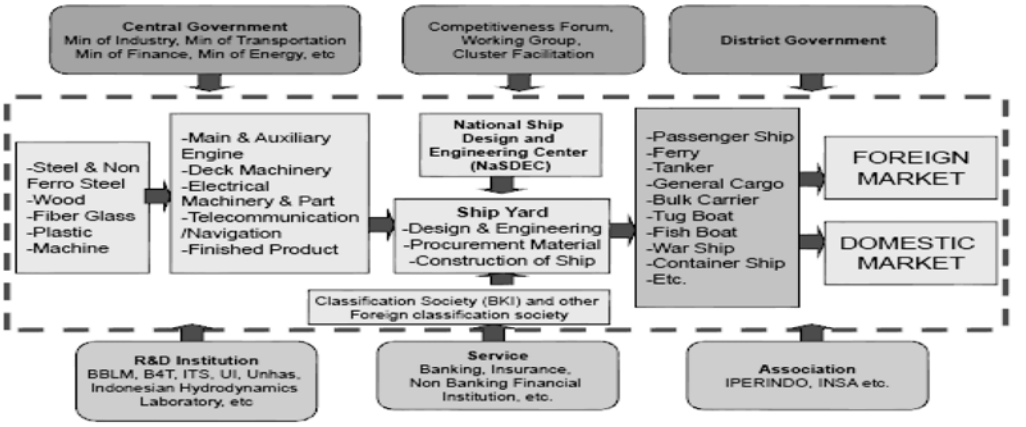
Figure 4-3-12 Patrol Boat Design of NaSDEC



Source: http://www.nasdec-indonesia.com/semua-download.html

Some Indonesian universities specialize in maritime technology including shipbuilding engineering and they have the facilities to train top level technicians in Indonesia. Especially ITS (Institut Teknologi Sepukuh Nopember di Surabaya) has educated professional engineers in marine engineering, naval architecture and shipbuilding engineering, offshore engineering, mechanical engineering and electrical engineering. In addition, there are maritime industry training centers for the development of human resources through technical training.

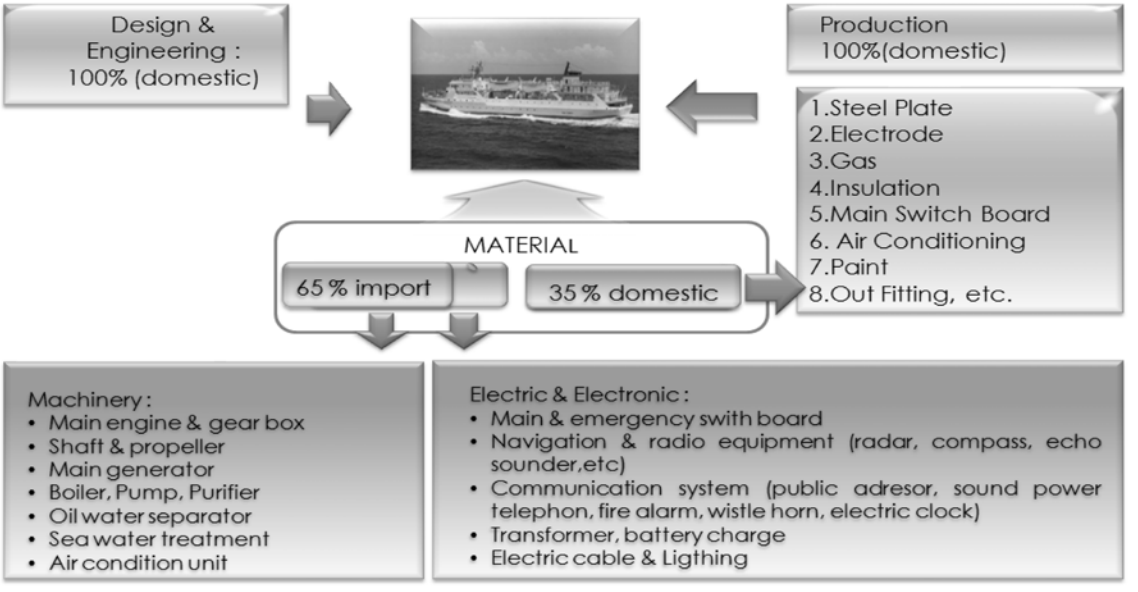
Figure 4-3-13 Indonesian Maritime Cluster



Source: Budi Marmadi(2009), " Maritime Cluster and Shipbuilding Development"

With regard to the production of new ships, Indonesia depends on foreign sources for about 65% of the components. Most of the machinery parts, electric components and electronics for vessel are imported. Design and engineering of domestic shipbuilding focus on small and medium sized vessels.

Figure 4-3-14 Downstream Structure of the Indonesian new building



Source: Ministry of Industry (2012)

Recently, the shipbuilding industry has been under government's protective policy (The Cabotage Principle) to increase self-reliance. The Cabotage Policy's goal is to increase the

replacement of old ships. Many old vessels numbering about 2,142 units have been replaced by this principle.

Table 4-3-5 The Effect of the Cabotage Policy for Shipbuilding Industry

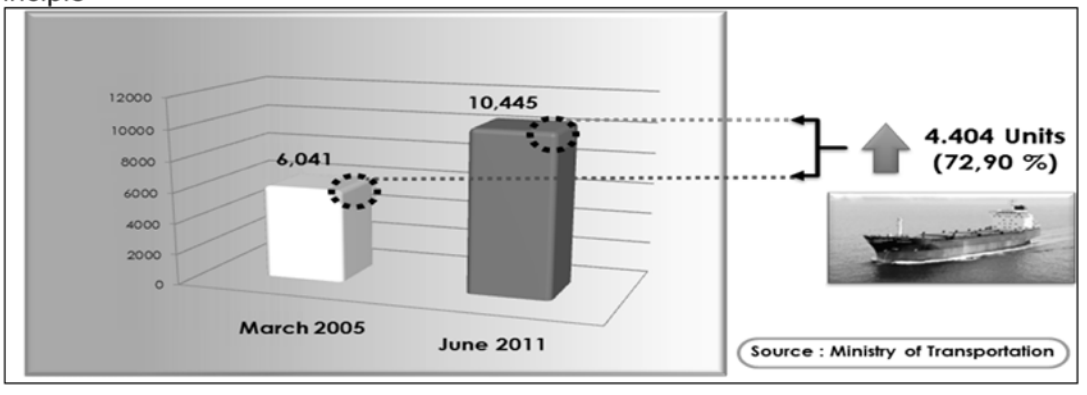
Ship's Type	Number of Ship(Unit)	
	Existing	Replacement
General Cargo	1,388	800
Container	107	80
Bulk Carrier	46	30
Barge	1,408	500
Tug Boat	1,357	500
Tanker	233	132
Passenger	229	50
Ro-Ro Vessel	60	50
Total	4,828	2,142

Source: Marwoto Nomo Dihardjo(2012

Note: These data do not include additional ships from economic growth which amounted to 654 units.

In addition, vessel demand increased from 6,041 units in March 2005 to 10,445 units in June 2011. The growth rate was 72.9% for about 6 years, and the average annual increase was 9.6%.

Figure 4-3-15 Vessel Demand Increase following the Implementation of the Cabotage Principle



Source: Ministry of Industry (2012)

However, owing to the lack of industrial infrastructures and techniques, Indonesia's shipbuilding industry is still around Korea's 70 to 80's level. Thus most ships are imported or

substituted from China, Korea, Japan and Singapore. For offshore plants, the ship owners have evaded the principle by charter.

④ Indonesian development plan for shipbuilding industry

Currently, there are about 240 shipbuilding enterprises with capacities up to 40,000 GT for new construction and repair. Among these, 234 enterprises belong to the private sector and the other 6 enterprises are owned by the government. Most government enterprises have small shipyards and old facilities. Expansion of their shipyards is difficult because they are located in big cities, Jakarta and Surabaya. Therefore, many small shipyards in operation or under construction could cause high level of logistics and operation costs. The Indonesian shipyards compete with Vietnam, Philippines and India for the cost of labor. Due to the steeply rising labor cost in China, Indonesia is expected to be a Post-China production base in the shipbuilding industry with its cheap and abundant labor force.

Figure 4-3-16 Government's Support for Shipbuilding Development

Source : Marwoto Nomo Dihardjo (2012)

The supporting policies for the shipbuilding industry are the Presidential Instruction No.5 (2005) called the Cabotage principle, Presidential Instruction No.2 (2009), Permendag 58 (2010), PermenKeu No. 176 (2009), PP No. 62 (2008), PP No 46, 47, 48 (2007), PP No. 24 (2009) and PMK 109, BMDTP program (2011), etc. These policies are for the empowerment of the shipping industry, the use of domestic product in government good and service procurement, regulation on the import of used or second hand goods, execution of entrance fee exemption for imported machinery, income tax facilitation for investment, promotion of

Batam, Bintan and Karimun Free Port and FTZ, and the promotion of the industrial special Economic Zone. Especially the BMDTP Program is to help bolster the competitiveness of domestic shipbuilding industry by reducing the entrance fee for imported ship components and equipment which are not yet produced domestically or not in sufficient volume.

Besides exploiting the domestic market, the shipbuilding industry has gradually entered the global market. Thus the need to improve facility and capability is ever more important with the increase in market demand. The Indonesian government has introduced long-term development plans for connecting the shipbuilding industry with basic industries, such as manufacturing industry, marine products industry, IT industry and energy development industry, which are mentioned in the 2011~2025 Indonesian economic development plan (MP3EI). This shows a more aggressive stance to attracting foreign investments.

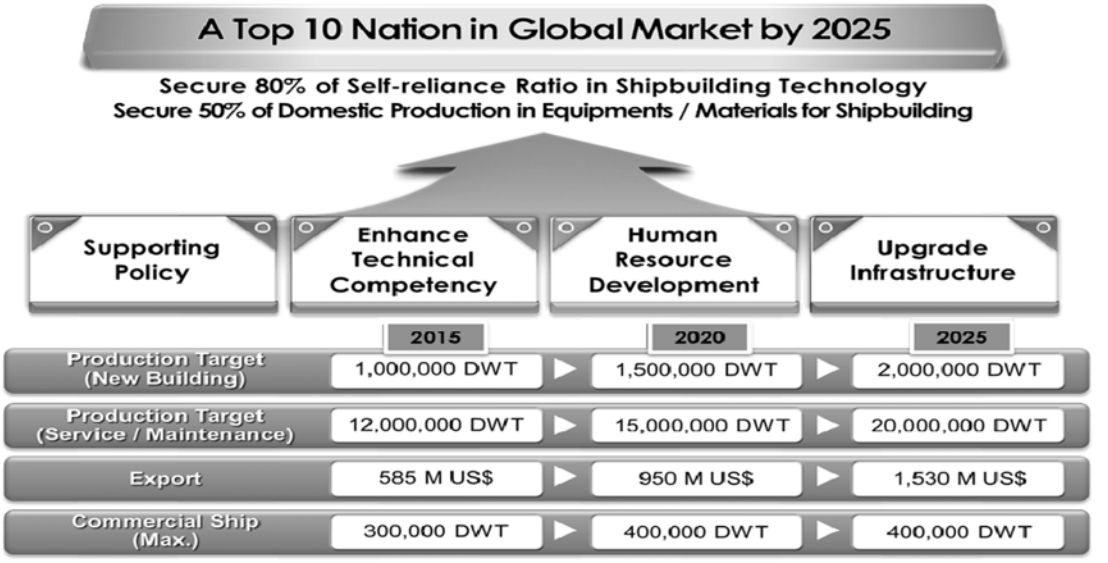
Table 4-3-6 Target for Indonesian shipbuilding development

		2012-2015	2015-2020	2020-2025
Install Capacity (DWT)	New Building	85.000	300.000	≥ 300.000
	Repair	150.000	300.000	≥ 300.000
Production (DWT/Year)	New Building	1.000.000	1.500.000	2.000.000
	Repair	12.000.000	15.000.000	20.000.000
Production Ship Type	Tanker Cargo Vessel	up to 85.000 DWT	up to 300.000 DWT	All
	Passenger Ship	1.000 Pax	Cruise Ship 1.000 Pax	All, Cruise Ship 2.000 Pax
	Defense	LCT, FPB, Korvet	LCT, FPB, Korvet, Frigate	LCT, FPB, Korvet, Frigate Submarine

Source : Marwoto Nomo Dihardjo (2012)

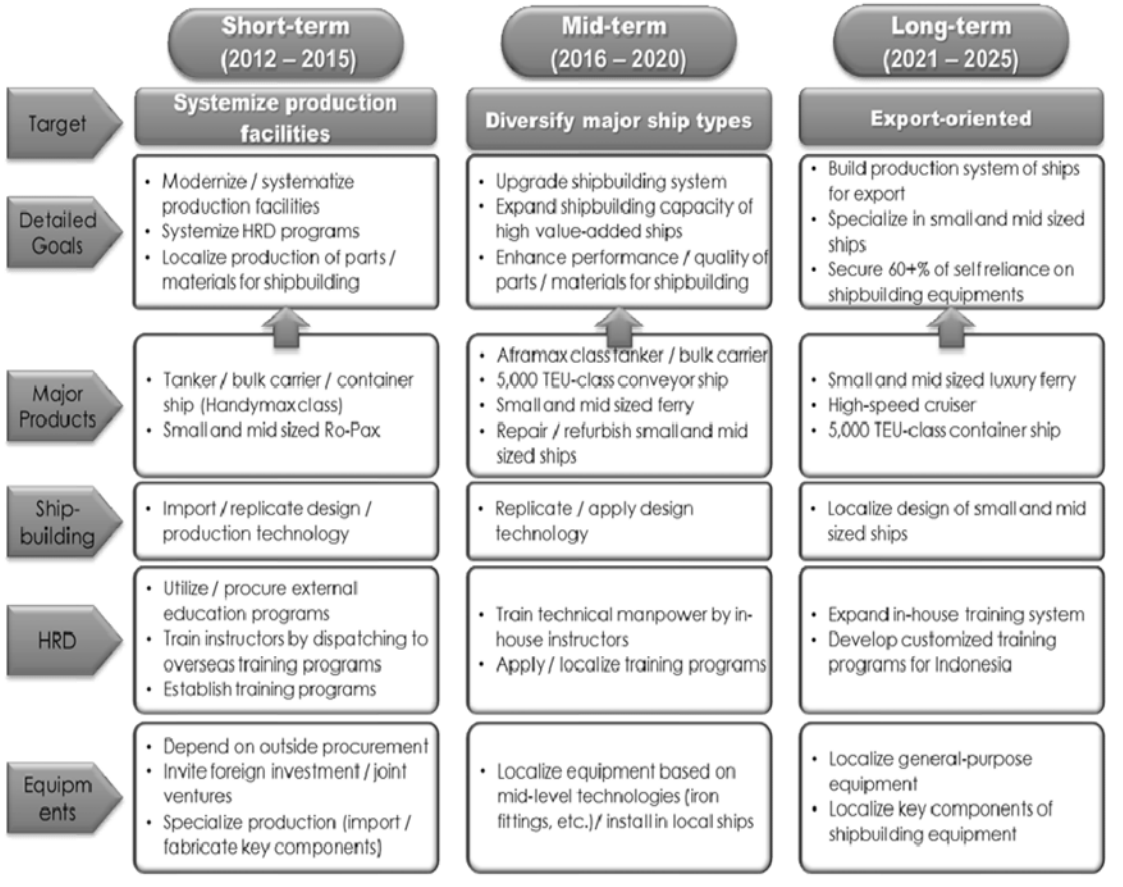
The vision and roadmap for the Indonesian shipbudiling industry dreafted by the Indoenesian governemtn are illustrated in <Figure 4-3-17> and <4-3-18>.

Figure 4-3-17 Vision of the Indonesian Shipbuilding Industry



Source: Ministry of Industry (2012).

Figure 4-3-18 Detail Planning for Target



Source: Ministry of Industry (2012)

4-4. Textile & Clothing

4-4-1. Global Market Trends

① World Fiber Production

World fiber production amounted to 73.47 million tons in 2010, with a steady average growth rate of 4% during the period between 2000 and 2010. This steady growth rate is mainly due to the growth of synthetic fiber production. World production of synthetic fibers amounted to 47.73 million tons in 2010 with an average annual growth rate of 5.3% during the period 2000 to 2010.

Production of natural fibers grew at an average annual rate of just 1.9% to 25.75 million tons in 2010. This represents a significant slowdown compared to the record 3.1% increase in the period of 1990 to 2000.

Table 4-4-1 World fiber production

(Unit: million tons, %)

	1990	2000	2005	2008	2010	growth rate
Synthetic fibers	17.65	28.43	36.16	39.57	47.73	5.3
(cellulosics)	2.76	2.22	2.48	2.54	3.63	5.0
(synthetics)	14.89	26.22	33.68	37.02	44.1	5.3
Natural fibers	20.62	21.31	25.73	24.77	25.75	1.9
(cotton)	18.59	19.84	24.38	23.43	24.46	2.1
(wool)	1.97	1.38	1.22	1.19	1.13	-2.0
(silk)	0.07	0.10	0.13	0.15	0.15	4.8
Total	38.27	49.75	61.89	64.33	73.47	4.0

Source: Fiber Organon,

Note: Growth rate is an annual average rate between 2000~2010

Table 4-4-2 Share by Country for Artificial Fiber Production

Unit: %

	2000	2005	2007	2009	2010	growth rate
China	23.6	47.7	55.3	61.4	62.9	16.2
India	6.6	6.0	7.2	7.8	7.3	6.4
Taiwan	11.5	7.5	6.0	5.1	4.8	-3.4
USA	11.6	7.6	5.6	3.9	3.9	-5.5
Korea	9.4	4.7	3.7	3.3	3.3	-5.2
Indonesia	4.7	3.7	3.5	3.5	3.2	1.3
Thailand	2.9	2.8	2.2	2.4	2.2	2.3
Japan	5.0	2.8	2.3	1.4	1.4	-7.1

Source: Fiber Organon,

Note: Growth rate is an annual average rate between 2000~2010

China and India are the world's leading manufacturers of synthetic fibers. During the period of 2000 to 2010, China and India's total production of synthetic fibers recorded the highest average annual growth rate of 16.2% and 6.4% respectively. In 2010, China's share of the world synthetic fiber production rose from 23.6% in 2000 to 62.9% and India's share rose from 6.6% to 7.3% in the same period. Indonesia is the 6th largest producer of synthetic fibers in the world. The value of synthetic fibers produced in Taiwan and Korea declined by an annual average of 3.4% and 5.2% during 2000 to 2010 as a result of stiff competition from rapidly growing countries such as China, India, Thailand and Indonesia. The global share of Korea’s production of synthetic fibers declined from 9.4% in 2000 to 3.3% in 2010 and that of Taiwan’s declined from 11.5% in 2000 to 4.8% in 2010

② Global Textile and Clothing Exports

The global textile and clothing exports amounted to USD 602 billion in 2010 with a steady growth rate of 5.5% during the period of 2000 to 2010. This was due to the increase in

exports from Asian countries. Clothing recorded a high annual average growth rate of 5.9% during the same period.

Table 4-4-3 Share in World Exports by Country

Unit: %

Country	2000	2005	2007	2008	2009	2010
China	14.7	24.0	29.2	30.4	31.8	34.3
E U	31.8	32.5	31.9	32.0	30.6	27.6
India	3.2	3.5	3.4	3.5	4.0	4.0
Turkey	2.9	3.9	3.9	3.8	3.7	3.6
USA	5.5	3.6	2.8	2.8	2.7	2.8
Bangladesh	1.5	1.7	1.7	2.0	2.2	2.1
Vietnam	0.6	1.1	1.5	1.7	2.0	2.2
Korea	5.0	2.7	2.1	2.0	2.0	2.1
Pakistan	1.9	2.2	1.7	1.8	1.9	2.0
Indonesia	2.3	1.7	1.6	1.6	1.7	1.8

Note: based on SITC

China is the world's largest producer and exporter of textile and clothing. China's share of the textile and clothing market increased by 2.3 times from 14.7% in 2000 to 34.3% in 2010. Asian developing countries' share expanded due to its competitiveness in low prices. The export share of India, Vietnam and Bangladesh rose from 3.2%, 0.6%, 1.5% in 2000 to 4.0%, 2.2% and 2.1% in 2010, respectively. But Korea's export share has declined due to the weakened price competitiveness compared to countries such as China, Vietnam and Indonesia. Korea's share in world textile & clothing exports declined from 5.0% in 2000 to 2.1% in 2010. EU and the USA's share of exports has declined from 31.8% and 5.5% in 2000 to 27.6% and 2.8% in 2010, respectively.

③ China’s Textile and Clothing Industry

During the "Tenth five-year plan" period (2001-2005), the Chinese government strived for self-sufficiency in textile products. The high export competitiveness in the downstream clothing sector in the 1990s fostered the development of the upstream textile sector during the period between 2001 and 2005. Following this period, China emerged as the world's largest producer of textile & clothing sector. Chinese acquisition of textiles for clothing production by fostering a domestic textile industry strengthened the competitiveness of Chinese clothing industry.

During the 11th Five-year Plan period (2006-2010), the Chinese government set the enhancement of textile and clothing product as one of the development goals and gradually placed an increasing amount of investment on advanced technical equipment. Through the promotion of value-added technical textiles, Chinese textile and clothing industry was planned to transform into a higher value-added manufacturing sector. Since then the synthetic-fiber industry has been promoting utility fibers, specialized fibers, and environmental-friendly fibers.

China’s exports recorded an annual average growth rate of 15.1% during the period 2000 to 2011 and China’s production recorded an annual average growth rate of 18.1% during the period 2000 to 2010.

However, there are many constraints on the further growth of China's textile and clothing industry. China's textile and clothing industry achieved rapid growth on the basis of abundant labor with low wages. Recently, the sector has been experiencing weak export competitiveness due to rising labor costs, the difficulty of securing labor, and appreciation of the Chinese yuan.

It was found that labor costs increased rapidly following the revision of labor laws in 2008 and the rise in minimum wages. Moreover, China’s new labor law provisions required an employment contract which promoted long-term contracts and permanent employment contracts.

As heavy industries such as electronics, automotive, and service industries develop, workers in the textile and clothing industry move towards these industries. Thus China's textile and clothing industry is having a harder time securing production workers.

Chinese Yuan appreciation caused the Chinese export competitiveness to drop. The exchange rate to the dollar was 6.23 in November 2012, which had declined by 22.8% and 14.9%, compared with 2005 and 2007, respectively.

China's textile and clothing industry is expected to have difficulties in attracting foreign direct investments (FDIs) and large-scale domestic equipment investment. In the past, China pursued aggressive policies for attracting FDI, such as leased land income tax exemption scheme and tax reduction incentives. However the effects of such policies have weakened as the direction of China's industrial policy turned to the promotion of heavy and chemical industries.

As a result, the growth rate of Chinese textile and clothing exports have slowed significantly. In 2011, the export volume of China's textile and clothing grew by a mere 2.8%. In particular, clothing export growth rate was 0.7%.

Table 4-4-4 Comparison of Labor Cost in the Textile Industry

Unit: US$/hour

	China	Malaysia	Indonesia	India	Vietnam	Pakistan	Korea
2011 (A)	2.10	1.96	1.08	1.06	0.60	0.58	8.22
2008 (B)	1.88	1.57	0.83	0.85	0.57	0.56	6.31
A/B (%)	11.7	24.8	30.1	24.7	5.3	3.6	30.3

Source: Werner International

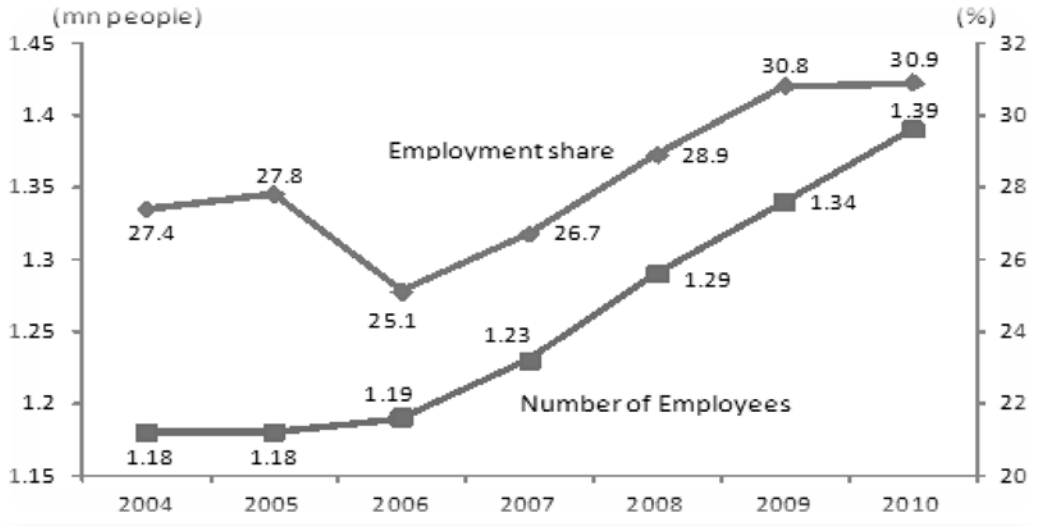
4-4-2. Current Status of Indonesian Textile and Clothing Industry

① The Importance of the Textile and Clothing Industry

Indonesia's textile and clothing industry is one of the most significant sectors that directly contribute to the economic growth in Indonesia. The textile and clothing industry is not only absorbing many workers but also producing the biggest foreign exchange compared with other sectors.

In 2010, the textile and clothing industry employed 1.39 million people - more than double the number employed 15 years earlier. The share of the textile & clothing industry in the overall manufacturer employment rose by 5.8% points from 25.1% in 2006 to 30.9% in 2010. A further 3.5 million people were engaged in related operations and hence were dependent on the sector indirectly.

Figure 4-4-1 Number of Employees in the Textile and Clothing Industry



Source: Statistics Indonesia (BPS)

Note: Employment share is the share of the textile and clothing industry in the manufacturing sector

The textile and clothing industry occupies an important role in the Indonesian economy and is the country's second largest source of foreign earnings, after the oil and gas sector. Textile and apparel exports for 2011 stood at USD 13.2 billion, which was equal to 6.5% of the country's overall exports. However this figure was 7.0% points lower than the share in 2000 as the country's export sector diversified. On the other hand, oil and gas was the largest export sector, accounting for 20.4% of the country's overall exports in 2011.

The industry also has an important position in the domestic market as textile and clothing sales in 2010 were about USD 9 billion. It also has a huge and expanding domestic market for textiles and clothing, given the nation's population of 245 million.

Indonesia is the world's 10th main exporter of textiles and apparel. Indonesia's share in world exports of textiles rose from 1.9% in 2005 to 2.1% in 2011.

② The Performance of Indonesia's Textile and Clothing Industry

The number of Indonesia's textile and clothing companies has declined since 2006. The number of companies amounted to 4,553 units in 2010, an annual 6.9% decrease during the period of 2006 to 2010. In particular, the number of clothing companies declined sharply at an annual average rate of 11.8% during the same period.

Table 4-4-5 Number of Indonesia's Textile and Clothing Companies

Unit: units

	2001	2005	2006	2007	2008	2009	2010	Growth rate (2006~10)
Textiles	1,901	1,934	2,809	2,820	2,355	2,601	2,585	-2.1
Clothing	2,123	1,922	3,256	2,917	2,655	2,140	1,968	-11.8
Total	4,024	3,856	6,065	5,737	5,010	4,741	4,553	-6.9

Source: Statistics Indonesia (BPS)

Note: Growth rate is an annual average growth rate

Table 4-4-6 Number of Employees of Indonesia's Textile and Clothing Industry

Unit: thousand people, %

	2005	2006	2007	2008	2009	2010	Growth rate
Fibers	29	29	29	30	30	31	4.2
Yarns	208	208	210	221	229	230	10.6
Fabrics	344	344	335	346	362	381	10.7
Clothing	346	361	408	436	459	489	41.1
Other made-up textiles	249	249	251	257	258	260	4.3
Total	1,177	1,191	1,234	1,289	1,337	1,390	18.1

Source: Statistics Indonesia (BPS)

Note: Growth rate between 2005 and 2010

The number of employees of Indonesia's textile & clothing industry, despite the decrease in the number of companies, increased by 18.1% between 2005 to 2010, from 1,177 thousand people to 1,390 thousand people.

The clothing industry plays a major role in employment creation. The number of employees in this sector recorded the highest growth rate of 41.1% during the same period.

Indonesia's textile and clothing production has increased since 2005. The textile and clothing production amounted to 5.323 million tons in 2010 an average annual increase rate of 7.4% over the period 2005 and 2010. In particular, yarn and fiber production recorded an average annual growth rate of 9.0% and 8.1%. On the other hand, clothing and fabrics production remained low with an average annual growth rate of 4.8% and 4.9%.

Table 4-4-7 Indonesia's Textile & Clothing Production

Unit: 1,000 tons, %

	2000	2005	2007	2009	2010	Growth rate	
						2000~05	2005~10
Fiber	971	752	976	1,017	1,110	-5.0	8.1
Yarn	2,056	1,623	2,129	2,207	2,502	-4.6	9.0
Fabric	1,546	963	1,362	1,107	1,226	-9.0	4.9
Clothing	554	383	467	410	485	-7.1	4.8
Total	5,128	3,721	4,934	4,741	5,323	-6.2	7.4
Other	-	-	105	102	117	-	-

Source: Statistics Indonesia (BPS)

Note: *Growth rate: annual average growth rate

In the early 1970s, Indonesia saw a rapid rise in synthetic fiber production. The production capacity increased by 9.3% from 1.68 million in 2005 to 1.84 million tons in 2012.

Table 4-4-8 Production capacity of Indonesia's synthetic fibers

Unit: thousand tons, %

		2005	2007	2009	2010	2011	2012	Growth rate
Synthetics	F	863	911	834	854	864	864	0.1
	S	557	545	525	545	547	547	-1.8
	sub-total	1,420	1,456	1,359	1,399	1,411	1,411	-0.6
Cellulosics	S	260	310	347	407	407	426	63.8
Total		1,608	1,766	1,706	1,806	1,818	1,837	9.3

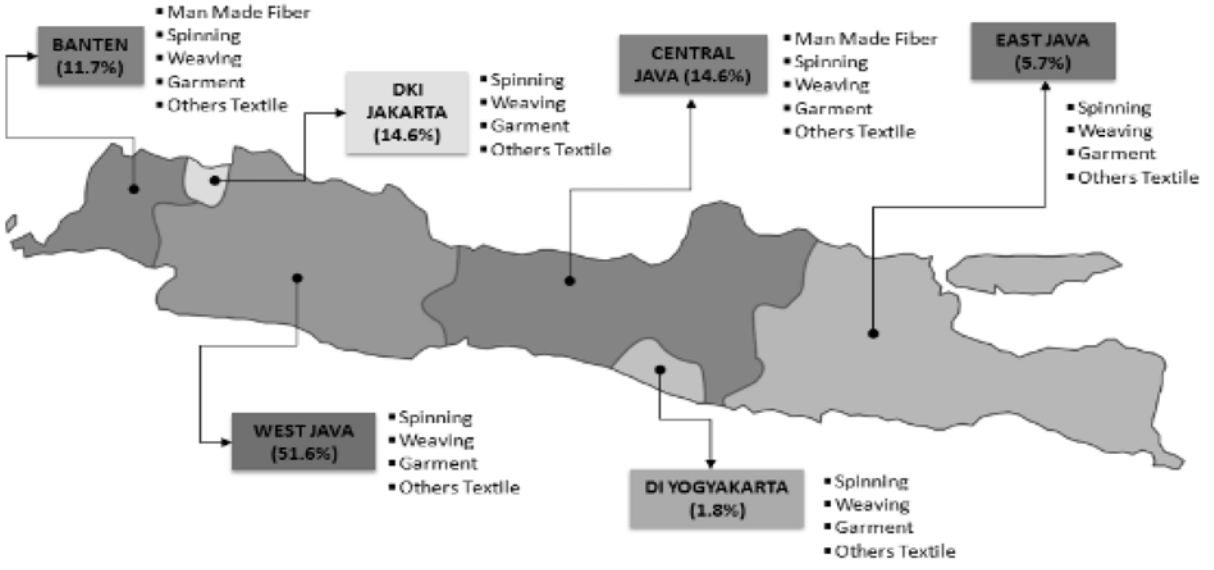
Source: Japan Chemical Fibers Association, Fiber Handbook 2012, 2011.12

Note: 1) Growth rate is growth rate during the period of 2005~12

2) F: Filament, S: Staple

Indonesia's textile and clothing sector is highly concentrated on the island of Java, in particular West Java. In 2010, almost 95.5% of the textile and clothing industry was located in Java and 54.8% in West Java alone. The clothing industry is highly concentrated in West Java, Jakarta and Batam Island, the latter being a free trade zone. 4.5% are located in other islands, namely Sumatera (North, West, and Lampung), Sulawesi (North and South East), Western Lesser Sundas –NTB (Lombok, Sumbawa).

Figure 4-4-2 Location of Indonesia's Textile & Clothing Industry



Source: Bintoro Dibyoseputro (2012)

FDI in the industry shot up almost three-fold from USD 155 million in 2010 to USD 497 million in 2011. The number of projects increased from 112 units to 166 units during the same period. By 2011, total FDI (cumulative basis) in the industry amounted to USD 2.4 billion. The biggest regions for foreign investment are West Java, Central Java, Banton, East Java, and Jakarta respectively in order. West Java, the single most important region, accounted for 52% of the total FDI, followed by Central Java with 21% and Banton with 17%

Table 4-4-9 Indonesia's Foreign Investment in the Textile and Clothing Industry

Unit: units, US$ million

	2006	2007	2008	2009	2010	2011
No. of projects	61	63	67	66	112	166
Value	424	132	210	251	155	497

Source: Indonesia Investment Coordinating Board (BKPM)

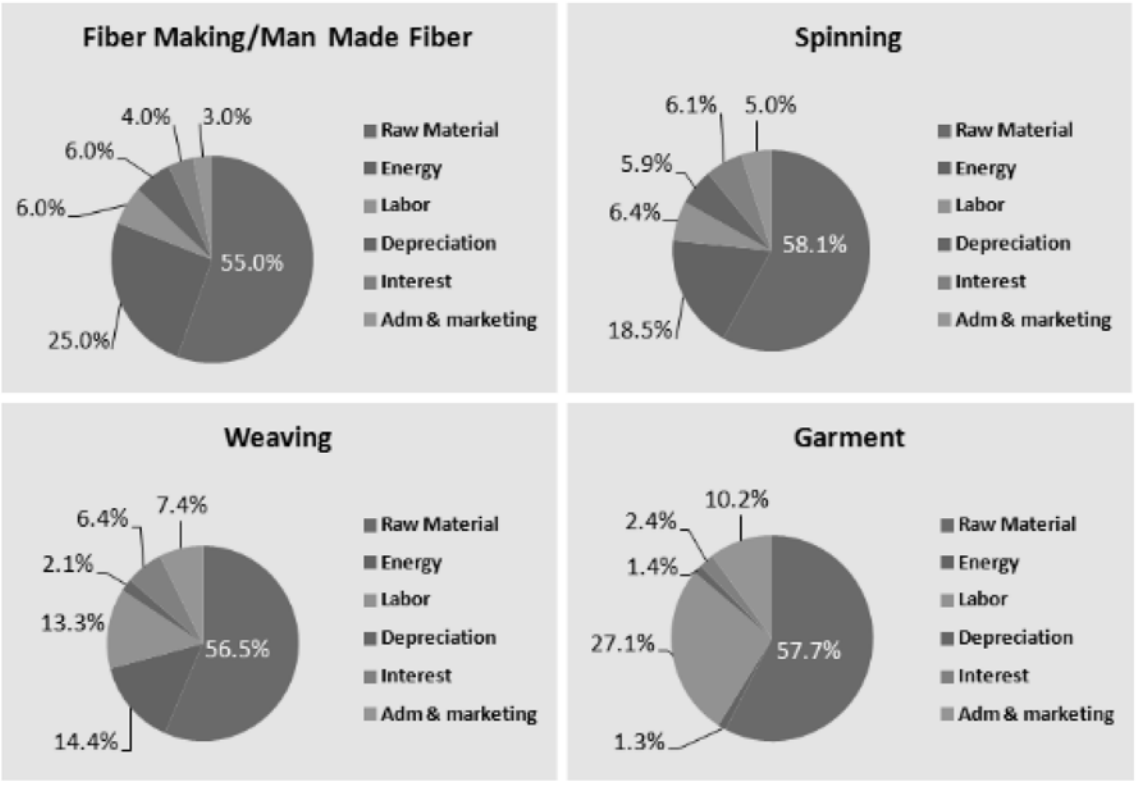
Stream-specific characteristics of the industry are as follows:

Up-stream (synthetic fiber, spinning) - capital intensive, large scale, full automatic technology, small number of workers, but large output per worker, huge energy consumption

Mid-stream (Weaving) - semi-intensive capital, modern high technology (growing rapidly), many workers than the upstream sector, large energy consumption

Down-stream (Garment) - many women workers hired, labor- intensive industry, high flexibility with varied customers of the final product

Figure 4-4-3 The Cost Structure of Stream



Source: Bintoro Dibyoseputro (2012)

4-4-3. Trade in Textile & Clothing

① Balance of Trade

Indonesia witnessed a trade surplus in textile and clothing. In 2011, this amounted to USD 6.5 billion, an increase of USD 0.3 billion from 2010. It also witnessed a trade surplus in clothing and yarn of USD 7.4 billion and USD 1.9 billion in 2011, respectively. On the other hand fabrics recorded a trade deficit of USD 2.7 billion in 2011, in particular, knitting fabrics and cotton fabrics recorded a trade deficit of USD 1.2 billion and USD 0.9 billion in 2011, respectively. Indonesia is increasing exports of clothing and imports of fabric used in the clothing production.

Table 4-4-10 Balance of Trade of the Indonesia's Textile & Clothing Industry

Unit: US$ million

	2005	2008	2009	2010	2011
Synthetic staple fibers	-7	3	-40	-23	-74
Yarns	1,353	1,264	1,257	1,769	1,856
(Synthetic filament yarns)	377	265	241	337	294
(Cotton yarns)	256	209	200	333	312
Fabrics	1,132	-881	-881	-1,824	-2,697
(Knitting fabrics)	5	-631	-552	-855	-1,177
(Cotton fabrics)	310	-363	-399	-709	-943
Clothing	4,846	5,783	5,447	6,212	7,359
Other	224	72	68	13	13
Total	7,549	6,242	5,851	6,148	6,457

Note: based on HS (5001~6310), Except for natural raw materials

② **Exports**

Indonesian textile and apparel exports decreased sharply in 2009 but made a strong recovery from the global financial crisis in the following year. Exports of textile and clothing increased by a rate of 21% in 2010 and 18% in 2011. Clothing accounted for 58.4% of the industry's total exports. This percentage was 2.6% points higher than the 55.8% in 2000. Exports of synthetic staple fibers, synthetic fiber spun yarns and staple fiber fabrics recorded the highest growth rate of 21.8%, 10.9% and 9.5% during the period of 2005~2011, respectively. While natural fiber fabrics decreased by 3.2% during the same period.

Table 4-4-11. Exports & Imports of Indonesia's Textile & Clothing

Unit: US$ million, %

	Exports			Imports			Growth rate (2005-10)	
	2000	2005	2011	2000	2005	2011	exports	imports
Synthetic staple fibers	109	206	670	269	212	744	21.8	23.3
Yarns	1,329	1,623	2,411	281	270	554	6.8	12.7
Natural fiber yarns	299	310	402	63	54	110	4.4	12.5
Synthetic filament yarns	476	579	647	188	202	353	1.9	9.7
Synthetic fiber spun yarns	551	732	1,358	25	10	77	10.9	40.1
Fabrics	1,888	1,533	1,964	868	400	4,660	4.2	50.6
Nature fiber fabrics	453	426	350	206	108	1,398	-3.2	53.2
Cotton fabrics	450	412	350	178	102	1,292	-2.7	52.8
Synthetic filament fabrics	761	531	802	188	58	844	7.1	56.1
Synthetic staple fiber fabrics	357	301	517	81	21	358	9.5	60.8
Knitted fabrics	76	75	88	146	70	1,265	2.8	62.1
Other fabrics	241	200	206	247	143	795	0.5	33.1
Clothing	4,562	4,900	7,691	25	53	332	7.8	35.7
Other made-up textiles	289	304	442	101	80	429	6.5	32.3
Total	8,178	8,565	13,178	1,544	1,016	6,720	7.4	37.0

Source: UN Comtrade

The country's largest textile and clothing export markets are USA, EU and Japan. Exports to the United States accounted for 34.7%, followed by the EU with 16.9% and Japan with 7.4% in 2011. Korea is Indonesia's 6th largest trading partner for textile and clothing. Korea's share of Indonesia's textile and clothing exports rose significantly from 2.8% in 2008 to 3.9% in 2011. Japan and Chinese's share rose from5.3% and 1.7% in 2008 to 7.4% and 2.8% in 2011, respectively.

There have been increases in exports through the implementation of FTAs. Indonesia's textile and clothing exports to FTA partner countries accounted for 21% of total exports to all destinations in 2010.

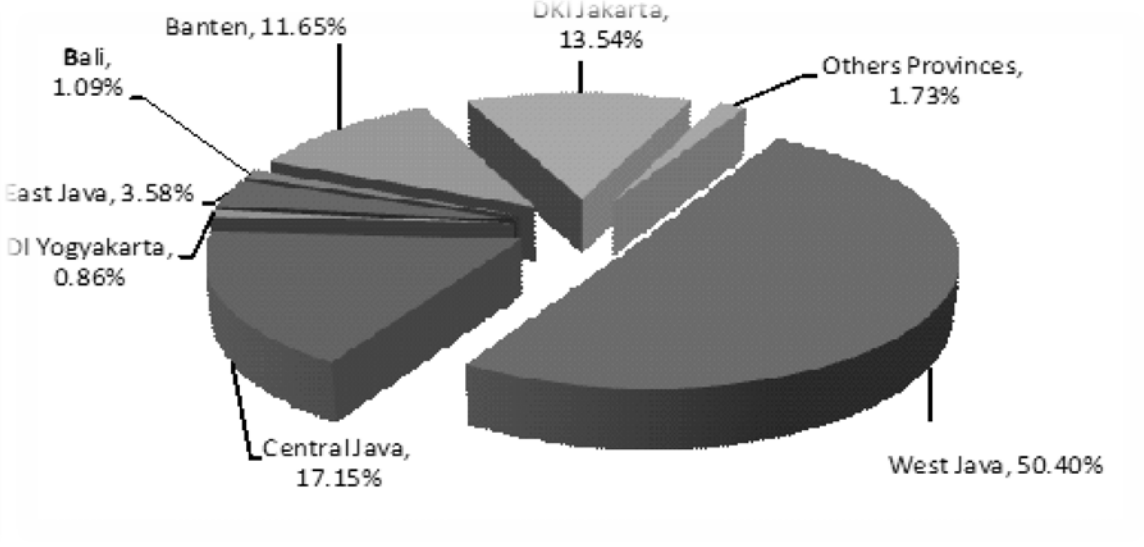
Table 4-4-12 Indonesia's textile & clothing export share by leading destination

Unit: %

	2008	2009	2010	2011
USA	37.6	37.7	37.1	34.7
EU	22.8	20.6	17.3	16.9
Japan	5.3	5.1	5.5	7.4
Korea	2.8	3.5	4.0	3.9
China	1.7	1.9	2.6	2.8

Source: UN Comtrade

Figure 4-4-4 Export Contribution per Province, 2010



Source: Bintoro Dibyoseputro (2012)

West Java, Central Java, Jakarta and Banton continue to be major export contributors. West Java accounted for 50.4% of the total exports, followed by Central Java with 17.2%, Jakarta with 13.5% and Banton with 11.7% in 2010.

③ Imports

In 2011, textile and clothing imports grew significantly by 33.9% to USD 6.7 billion, after surging at a rate of 48.7% in 2010.

Table 4-4-13 Indonesia's Textile & Clothing Imports by Leading Destinations

Unit: US$ million, %

	Imports					Share			
	2008	2009	2010	2011	growth rate	2008	2009	2010	2011
China	1,024	1,035	1,682	2,302	22.4	26.5	30.7	33.5	34.3
Korea	761	655	990	1,402	16.5	19.7	19.4	19.7	20.9
Japan	207	163	250	294	9.1	5.4	4.8	5.0	4.4
Total	3,860	3,375	5,020	6,720	14.9	100	100	100	100

Source: UN Comtrade

Note: Growth rate is an annual average growth rate between 2008~2011

Fabrics accounted for 69.3% of total imports. This percentage was 4.8% points higher than the 64.5% in 2008. Indonesia is expanding its imports of fabrics used in clothing production on account of its increased exports in clothing. Import of fabrics recorded the highest growth rate of 50.6% during the period 2005 to 2011.

China and Korea are by far the largest suppliers of textiles and clothing to Indonesia. China accounted for 34.3% of the share, followed by Korea with 20.9% in 2011. Indonesia is expanding its imports of advanced textiles from Japan

④ World market share of Indonesia's textile and clothing industry

Indonesia is the 10th largest producer and exporter of textiles and apparel in the world. The share of Indonesian exports of textile and clothing rose from 1.9% in 2005 to 2.1% in 2011. There has been a sharp rise in Indonesia's share of synthetic staple fibers, synthetic staple fiber fabrics, and synthetic filament fabrics. The share of these three sectors rose from 2.6%, 2.9% and 3.1% in 2005 to 5.3%, 3.6% and 3.5% in 2011, respectively. Clothing also rose from 1.9% in 2005 to 2.0% in 2007 and more to 2.2% in 2011.

Table 4-4-14 World market share in Indonesia's textile & clothing industry

Unit: %

	2005	2006	2007	2008	2009	2010	2011
Synthetic staple fibers	2.6	3	3.5	4.3	4.6	4.9	5.3
Yarns	4.7	4.5	5.7	4.7	5.0	4.9	4.9
Natural fiber yarns	2.3	2.2	2.7	2.2	2.1	2.3	2.1
Synthetic filament yarns	4.0	3.8	4.1	3.5	3.7	3.5	3.3
Synthetic fiber spun yarns	13.7	12.4	17.7	15.4	16.0	14.6	14.6
Fabrics	1.4	1.3	1.4	1.3	1.3	1.3	1.4
Nature fiber fabrics	1.2	1.1	1.1	0.9	0.8	0.9	0.9
Cotton fabrics	1.6	1.4	1.6	1.3	1.1	1.1	1.1
Synthetic filament fabrics	3.1	3.0	3.7	3.2	3.5	3.1	3.5
Synthetic staple fiber fabrics	2.9	2.5	3.1	3.3	2.7	3.3	3.6
Knitted fabrics	0.4	0.4	0.4	0.4	0.4	0.4	0.3
Other fabrics	0.7	0.7	0.6	0.6	0.6	0.6	0.5
Clothing	1.9	1.9	2.0	1.9	2.0	2.0	2.2
Other made-up textiles	0.6	0.5	0.7	0.5	0.5	0.5	0.5
Total	1.9	1.8	2.0	1.8	1.9	1.9	2.1

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Werner International http://www.wernerinternational.com/

V. Policy Recommendations for Industrial Sectors Development

Cheul Cho, Kyoung-Sook Lee, Sung-In Hong, Hoon Park[19]

The previous chapter has analyzed the global trends and the current status of industrial development in Indonesia of the four strategic industrial sectors selected for this joint research. Now in this chapter, the four authors of KIET are proposing the policy recommendations for industrial development of each industrial sector in Indonesia. In the process, they referred to the industrial development experiences of Korea and tried to draw out the lessons that can be of useful reference for the Indonesian case. Overall, there recommendations are drawn against the global trends and analysis on the Indonesian status, as well as Korean experiences, and in so doing they tried to provide the intellectual inputs that could help the policy making works of Indonesian authorities.

5-1. Automobile

5-1-1. Lessons from the Korean Automotive Industry

☐ The Status of Korean Automobile Industry

Korea ranks the 5th in the global auto production and the 4th in exports after Japan, France, and Germany. In terms of the market size, Korea's domestic automobile sales are ranked the 13th in the World. Korean automotive industry has a high degree of dependence on exports. The export ratio stood at 69% in 2011.

[19] The four authors of this chapter are all Research Fellows of KIET. Automobiles was written by Cheul Cho, Consumer electronics by Kyoung-Sook Lee, Shipbuilding by Sung-In Hong, and Textiles & Clothing by Hoon Park

Table 5-1-1. Supply and Demand Situation of Korean Motor Vehicles (2011)

Unit: 1,000 units

Production	Export	Domestic Sales	Import	Export / Production (%)
4,657	3,152	1,475	118	69.2

Source: KAMA

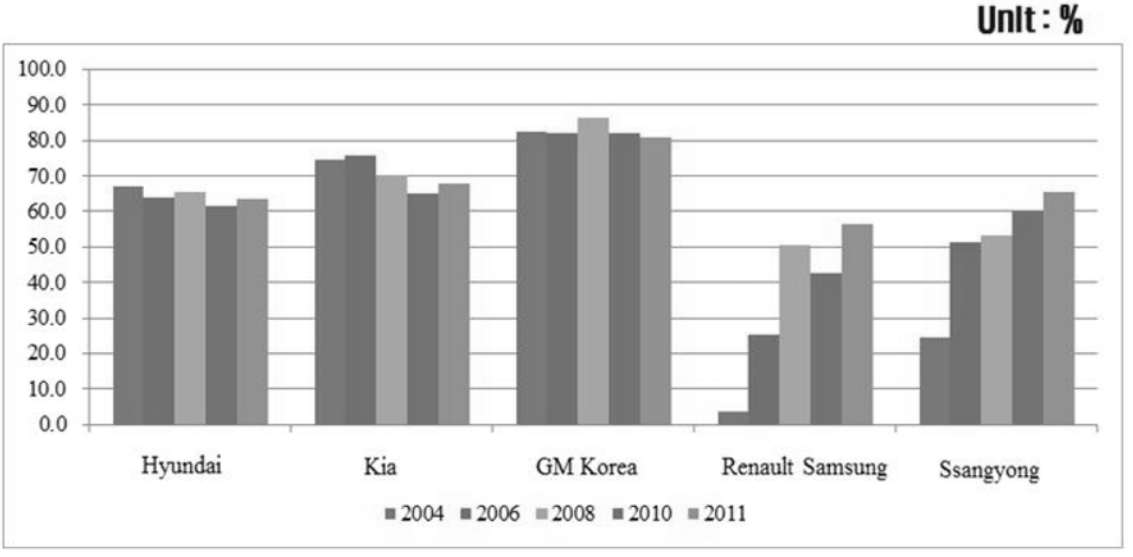
The quality of Korean automotive has improved dramatically. In 2006, Korean cars were praised by consumers and ratings agencies as some of the best in terms of qualities. and since then, they have been consistently rated as the top level cars.

Table 5-1-2. Initial Quality Study (IQS) of J.D.Power (2006)

Ranks	1	2	3	4	5	6
Makers	Porsche	Lexus	Hyundai	Toyota	Jaguar	Honda
Problems	91	93	102	106	109	110

Source: J.D. Power Car Ratings Homepage

Figure 5-1-1. Trend of Export Rate among Major Automobile Companies in Korea



Source: KAMA

① Sales Structure of the Korean Automobile Companies

The automotive sector has led South Korea's exports. Hyundai, Kia and GM Korea have continued to maintain 60% of their sales through exports. Exports made up 80% of GM Korea's sales in 2011 (GM Korea's KD exports reached 1.24 million vehicles which exceeded the production of assembled vehicles). Companies that used to depend largely on their domestic markets have changed their sales strategy recently. Renault Samsung Motors and Ssangyong Motor achieved export rates of 56.6% and 65.5%, respectively in 2011.

② Overseas Production of the Korean Automotive Industry

Along with the expansion of exports, Korean auto makers have significantly increased the level of overseas production. China's rapidly growing domestic market especially fueled the expansion of Korean automakers' overseas manufacturing in China to the production level of 1 million cars in 2010 (Beijing Hyundai's production exceeded its production capacity). Korean carmakers have production operations in USA and in several countries of Asia and Europe, including Russia (see Table 5-1-3), and Hyundai came to add new production sites in Brazil and Beijing by the second half of 2012.

Table 5-1-3. Regional Trend of Korean Carmakers' Overseas Production

Unit : vehicles

	Total	India	China	USA	Turkey	Czech	Slovakia	Russia
2004	415,959	203,324	212,635	-	-	-	-	-
2007	1,161,958	338,755	337,426	250,519	90,180	-	145,078	-
2010	2,604,762	600,480	1,043,307	454,165	77,000	200,088	229,505	217
2011	3,140,683	619,785	1,176,404	611,878	90,231	251,146	252,252	138,987

③ The Position of Automotive Industry in the Korean Economy

The automotive industry plays a major role in the South Korean economy today. The automotive industry not only takes up a large share of the national economy, but also

spreads significant spillover effects to the steel, chemical, textiles, machinery, and electronics industry.

Table 5-1-4. Importance of Automotive Industry in Korean Economy

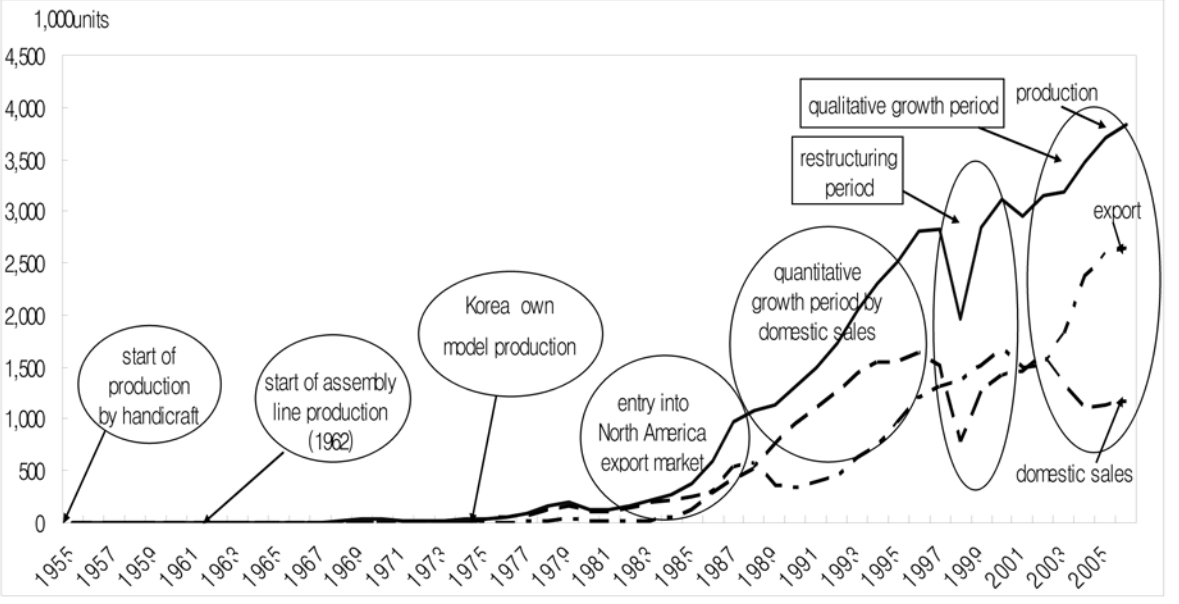
Employment Share of Manufacturing (2009)	Production Share of Manufacturing (2009)	Share in Total Export(2010)
10.7%	11.4%	12.3%

Source: KAMA

☐ Development History of Korean Automobile Industry

Korean automotive industry growth has been accelerated greatly during the last 40 years. Development and mass-production of Korean automobiles and entry into the North American market initiated an unprecedented export boom. In addition, the quality of the automobiles has improved dramatically through restructuring and the quantitative effect of growth.

Figure 5-1-2. Developing Process of Korean Automotive Industry



Source: Chuel Cho (2007)

① The Beginning of the Korean Automotive Industry (1955-1961)

The Korean automobile industry established production bases in the late 1950s. Korea produced auto parts for after sales service market (spring, engine parts, brake parts, and lamp parts) and remodeled used automobiles. They accumulated experience for disassembly and assembly by completely disassembling auto parts. Korea produced the first Korean automobile named “Sibal” which was locally assembled and some of its parts were produced in Korea (August 1955). But Sibal did not stay in production for long because of gasoline shortage and introduction of modern KD assembly cars.

② Modern Knock Down Assembly Production Period (1962~1974)

The very first automobile company in Korea, Saenara was equipped with modern assembly facilities (August 1962). It assembled using a Nissan Bluebird kit, equipment from Nissan Motors. The government established a “5-Year Automobile Industry Plan” which designated only one maker for producing cars in order to prevent excessive competition. Saenara used Semi Knock Down (SKD) production method. However as Saenara's assemblers spent a lot of foreign currency in importing most of their components it collapsed in June 1963. It was then merged with Sinjin Automobiles (1965). (Introduction of Toyota Crown Model and its technology). Sinjin adopted Complete Knock Down (CKD) production method, a method of supplying parts to a market.

The government permitted the entry of new car makers because of adverse effect of monopoly (ignorance of parts localization policy). New entry car manufacturers were Asia Motors (1965, technology import from Seri, France), Hyundai Motors (1968, technology import from Ford), Kia Motors (1971, technology import from Honda). South Korea's automotive industry had 3 major companies—Hyundai Motor Company, Kia Motors Corporation, and Daewoo Motor (Kia Motors merged Asia Motors at 1976, Daewoo took over Sinjin). However they still faced the problem of the localization of auto-parts.

③ Indigenous Model Production and Early Growth Period (1975~1985)

The government revised its automotive industry policy for the localization of auto-parts. The core target of the policy (“Long-term Promotion Plan of Automotive Industry, May 1974)

was small car production. Shinjin entered into a joint venture with General Motors and formed General Motors Korea (50:50, 1972). Kia had technology transferred from the joint venture with Mazda.

Hyundai did not have a partner for joint venture or technology partnerships. Hyundai developed its first indigenous model, “Pony” (1975) with a design from Italy ("Ital Design") and engines & transmissions from Mitsubishi of Japan. The establishment of its plant (assembly line and core parts production) was supported by Japan, UK, USA, and Germany. Hyundai had great success with “Pony” in Korea. It exported 1,243 units in 1976 and 31,486 units in 1979. It reached a domestic market share of about 60%. Korea’s auto production increased to 204,447 units (1979) from 37,179 units (1975).

Motor vehicle production decreased to 123,135 units in 1980 because of the 1979 oil crisis and political unrest. In response, the Korean government implemented the “Automobile Industry Rationalization Policy” in 1982. As part of an industrial plan Kia was excluded from producing passenger cars, but instead assigned to producing small buses and trucks. Only Hyundai and Daewoo's Saehan could produce passenger cars. The rationalization policy was abolished in 1989.

④ Export Expansion and Quantitative Growth Period (1986~1997)

During this period, Korean cars made a successful entry into the U.S. market; hence, its exports increased significantly. The exports increased from 52,350 units in 1984 to 546,310 units in 1987. The Excel was the first Hyundai car to be exported to the United States[20] and Hyundai Motors then launched the construction of a plant with the capacity of producing 300 thousand cars annually. The automotive industry grew into South Korea's biggest export industry. After hosting the Olympic Games (1988), Korean domestic demand of automobile increased rapidly. Appearance of new auto makers also played a role in the growth of the automotive industry. Kia reopened car production (1986), Daewoo Shipbuilding & Heavy Machinery Ltd started car production (1991), and Samsung entered the car industry (1995).

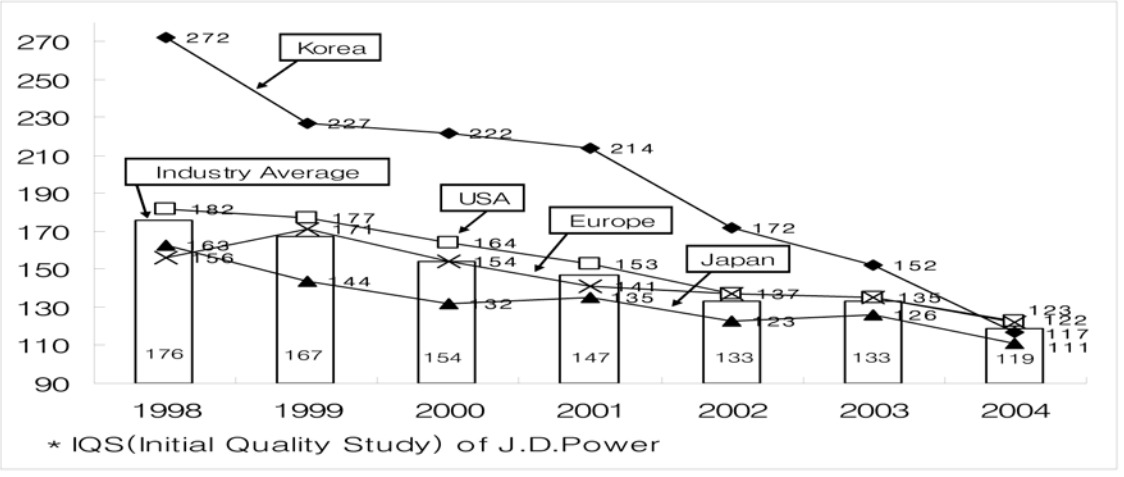
[20] Hyundai's Pony was exported for the first time as a Korean car to Ecuador in 1976, and after ten years in 1986, Hyundai's Excel was first exported to USA.

⑤ Restructuring and Qualitative Growth Period (1998~)

A number of auto manufacturers filed for bankruptcy and were merged into other auto manufacturers in late 1990s because of competition from new emerging players, expansion of production capacity, and the foreign exchange crisis. Kia Motors was merged by Hyundai Motors (1998), Samsung Motors was merged by Renault (2000), General Motors bought Daewoo Motor's assets (2002), and Ssangyong Motors was merged by Shanghai Automotive Industry Corporation (SAIC) in 2004.

Since the restructuring of automobile companies, the automotive industry has experienced qualitative growth. After 2001, Korean cars have been able to achieve incredible improvements in quality. Korean auto manufacturers produced and exported high class cars and the average price of Korean export cars rose from USD 9,100 (2002) to USD 11,300 (2006).

Figure 5-1-3. Car Quality of Major Car Production Countries in USA Market



Source: J.D.Power

□ Success Factors of Korean Automotive Industry

① The Innovative Entrepreneur (the late Chung, Ju Young)

Former chairman of the Hyundai Chaebol, Chung Ju Young took risks for development of the "Pony" as the first Korean car. Investment for the original model production required 400

billion won. At the time, the total capital of Hyundai Motors was only 1.7 billion won. Hyundai had the shortest production experience among Korean car makers (only 6 years). In 1975, the size of the domestic automobile market was only 13 thousand units. But the plant for the new car model was designed to produce 56 thousand units. He had optimistic forecasts for both the global and the domestic market. He also planned to build a 300 thousands units production line for export to North American market in 1981. Chung's innovative spirit in the auto industry was diffused through the entire Korean automotive industry.

② Government Support for Automotive Industry Development

The Korean government passed "The Heavy & Chemical Industry Promotion Policy" in 1973. As part of this policy the automotive industry was selectively fostered. The heavy & chemical industry such as steel, chemistry, and machinery became the basis for development of the automotive industry.

Protection of the domestic market from foreign competition was also important for the development of the automotive industry. Import regulation of motor vehicles became effective in 1962 by "Automotive Industry Protection Law" (Permission of Cars Importing for KD Assembly). After production of an indigenous model, car import was prohibited completely. Import liberalization in 1987 allowed Korea to export over 500 thousands motor vehicles abroad. Korea levied high tariff on motor vehicles until 1995 when it exported over one million motor vehicles (levying 50% tariff in 1987, 8% tariff 1995). Korea also prohibited the import of Japanese cars, which were the strongest rival of Korean cars (removal of the ban in 1998). Independent development of Korean automotive industry started from the restriction of foreign direct investment. Foreign equity could not exceed 50% because of management right defense (liberalization of foreign investment in 1998).

Mainly three auto companies enjoyed the benefits of economies of scale and effective competition. The very small size of the domestic market discouraged foreign entry into the monopolized market.

The government enforced a policy for promoting localization of part production. Part localization was a common characteristic of the automotive industry policies (1962, 1965, 1969, and 1974) and it was directed towards the production of a Korean model. An import restriction on localized parts was very important. KAICA (Korea Auto Industries Cooperative Association) had import permission right of auto parts.

The government had strong initiative to develop the automotive industry. The President personally directed the development of Korea's own model (1973) and local management-labor relationships were controlled by the Government. Auto manufacturers could concentrate on production and sales under a stable relationship between labor and management. Because of political democratization in 1987, labor dispute sharply increased.

Without the sufficient supply of qualified and diligent workers, development of Korean automotive industry would have been impossible. The automotive industry needs many workers with secondary education and professional engineers. Luckily, Korea had a very strong demand for education.

Table 5-1-5. Production Technology Absorption Process of Hyundai Motors

(Development Participation Ratio % of Hyundai Engineer)

	Pony	Pony II	Stellar	Excel
	74.1~75.12	80.1~81.12	81.1~83.5	82.1~84
Styling	0	0	0	0
Power train Design	0	0	0	0
Body Design	20	45	50	60
Skin Layout	20	45	50	60
Master Drawing	20	45	50	60
Detail Drawing	35	70	50	80

Source: Chuel Cho (2007)

③ Technology Accumulation Process

Korean automotive industry obtained production experience as well as assembly and parts development technology through KD assembly (1962~74). It also learned product development technology from foreign manufacturers (1975~90). Korea developed its own model "Pony" with accumulated development experience backed by foreign technology help.

After 1991, Hyundai achieved independent model development through accumulated experience. Hyundai engineers accomplished styling and power engine development (1991). It was able to produce various types of cars (SUVs, CDVs, small sedans, medium sedans, large sedans, etc.). It became less dependent on foreign technology and attempted to promote its own technology. Recently Hyundai has developed a luxury model and is preparing for mass production.

Table 5-1-6. Number of Technology License

	Hyundai	Daewoo	Kia	Total
Assembly Stage(1962~74)	7	6	6	19
The First period(1962~67)	0	2	3	5
The Latter Period(1968~74)	7	6	6	19
Production Stage(1975~90)	72	30	29	131
The First period(1975~81)	26	8	2	36
The Latter Period(1982~90)	46	22	27	95
Creation Stage(1991~93)	7	25	22	54
Total (1962~93)	86	61	57	204

Source: Kim, Yang Hee (1993)

5-1-2. Master Plan for the Indonesian Automobile Industry

☐ The Basic Direction for Automotive Industry Development

① Development of Original Brand Car Maker

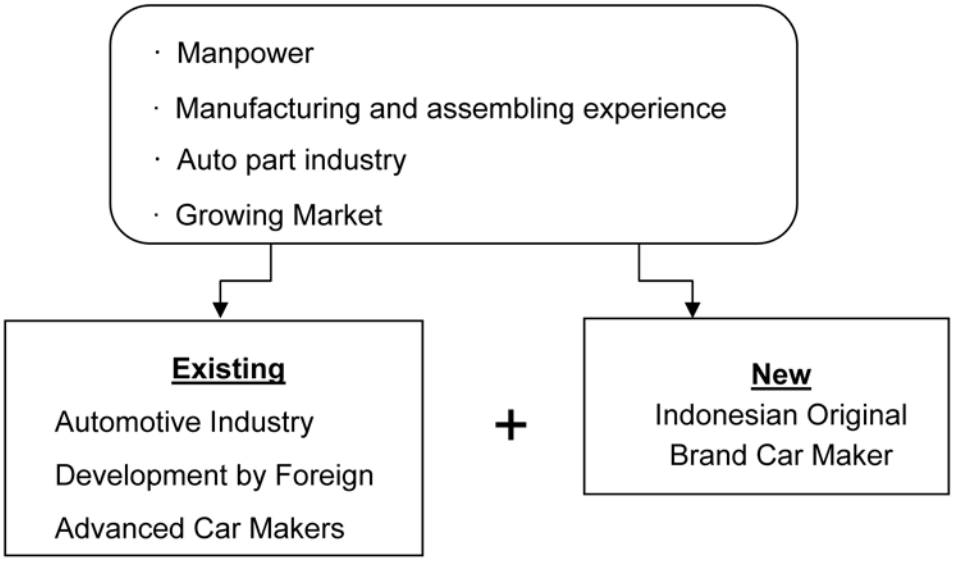
There are several models for automotive industry development. The first example is a KD assembly production model in which parts are manufactured in the country of the developed car makers and then imported in the local country for final assembly (ex. Iran, Korea during 1962~1974, Uzbekistan). The second model is KD assembly production model where foreign advanced cars are manufactured by foreign advanced car makers operating in the local country (ex. Brazil, Spain, Mexico, Thailand, etc.). Most developing countries have these two models of automotive production. The third model is the onel where the automotive industry is being developed by producing the local country's original car models. For this model, Korea is the only successful case after the World War II. The fourth model is where the automotive industry is being developed by the introduction of foreign advanced technology with local brands. These countries have big car markets, and. China and India are good examples. They not only have developed the automotive industry through advanced car makers, but they are also developing their original brand with foreign technology.

5-1-7. Automotive Industry Development Model

Development model	Example
KD assembly production of foreign advanced cars by national companies	Iran, Korea of 1962~1974, Uzbekistan
KD assembly production of foreign advanced cars by foreign advanced car makers	Brazil, Spain, Mexico, Thailand, etc.
Automotive industry development by the production of original local models and brand cars	Korea is the only successful case of this model after World War II
Automotive industry development strategy through introducing advanced technology from developed foreign car markets.	China, India (developing their original brand with foreign technology)

The appropriate development model for the Indonesian automotive industry is the fourth case of China and India. Recently Indonesia's basic condition for automotive industry development is on the positive side. While the production process of vehicles is very complicated and the technology is also undergoing rapid changes, Indonesia has certain advantages that can set then ahead in the market. These include car production experience for over 30 years, abundant skilled manpower, and the existence of related industries.

Figure 5-1-4. The New Direction for Indonesian Automotive Industry Development



Although its car market is not so big compared with China and India, it has great potential for future growth. The production of original models and the introduction of cutting edge technology should become Indonesia's main goals. Looking at the precedence of Korea and China, underdeveloped car makers can also localize auto parts and export automobiles. Another issue is that the current Indonesian automobile industry is absolutely dependent on Japanese car makers. Competition between various companies should be introduced for the future development of Indonesian automotive industry.

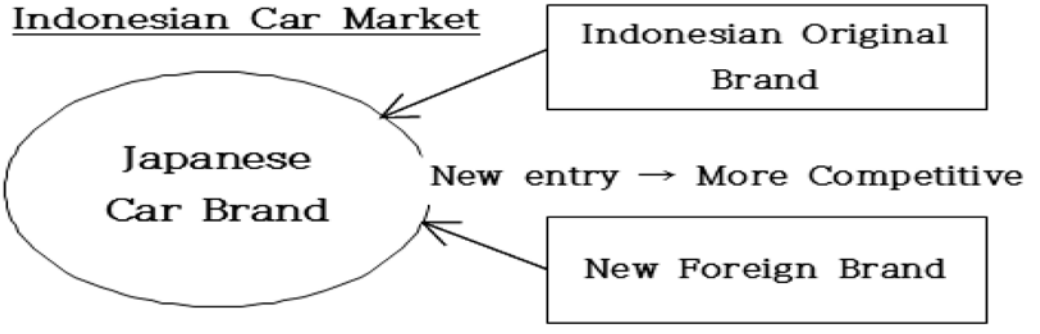
② Inducement Programs for New Advanced Foreign Car Makers

Currently, Indonesia's car industry fully relies on Japanese car makers. The government must offer enough incentives for new car makers in order to foster prolific competition. Not only developing countries but also developed countries provide various incentives to attract foreign car makers. The incentives pertain to tax, land, industrial infrastructure (road, harbor, etc.), and labor condition.

③ New Competition System for Indonesian Automotive Industry

If both new foreign car makers and Indonesian brand car makers enter into the local market, it will become more competitive, and as a result, more efficient. For production efficiency, car makers will increase the local content of parts. For example, due to the high competition of the Chinese car market, the local content of Hyundai China plant is over 90%. Backed by low cost and low prices, Indonesian car export will increase.

Figure 5-1-5. The New Competition Structure of Indonesian Automotive Industry



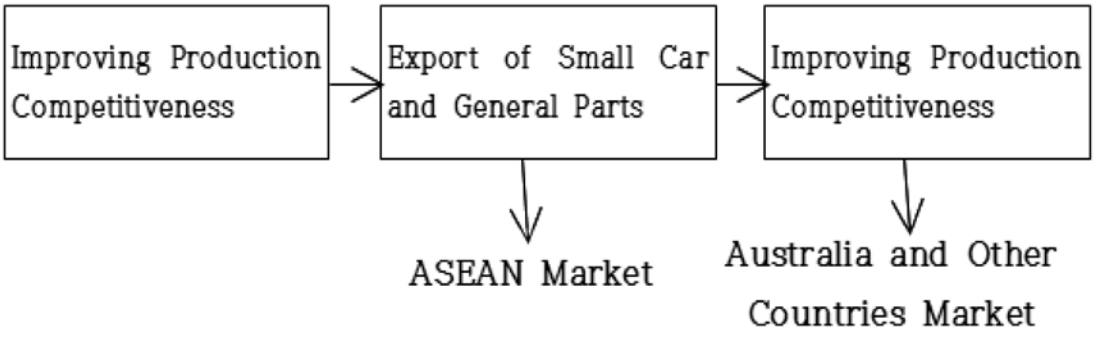
Monopoly intrinsically causes lots of problems such as indifference to local contents of parts, technology development, human resource nourishment, etc. In order to prevent such an adverse effects of monopoly, the Government needs to offer extra supports to domestic manufacturers which utilize local parts and human resources.

④ Promote Automotive Industry as Export Industry

Indonesia's small automotive industry size can be overcome through export. Currently it can only produce cars for domestic sales because it lacks competitiveness in the international market. Therefore, the scale of production is decided according to the size and the level of protection for the domestic market. However, for sustainable development it needs to export.

Indonesia must consider both the domestic market and the export market when selecting initial production models. Major potential export markets are ASEAN and Australia. If Indonesia obtains competitiveness in assembly, its initial export markets will be the ASEAN countries. Once the quality matures, Indonesia will be able to export its cars to other countries. For instance, Thailand exports its cars not only to the Asian market but also to Australia. More specifically, in 2011, Thailand produced 1.46 million units, and among these exported 0.73 million units which is 50% of the production.

Figure 5-1-5. Export Strategy of Indonesian Automotive Industry



Auto parts can also become a good export industry for Indonesia. Some auto parts do not necessarily require sophisticated technology. If it has a cost advantage, Indonesia can export auto parts. First of all, it should start with supplying these auto parts to locally situated foreign car makers.

⑤ Reinforced Support for Auto Parts and Relevant Industries

Auto parts and related industries can be a great source of value-added products. An automobile is composed of many parts and materials, and a lot of other industries such as electronics, machinery, steel, and chemistry are related to automobile production. The automotive industry demands a lot of machinery, electronics, and material and thus outside industries account for over 70% of the production cost.

Parts and related industries are very important for the improvement of quality, price, performance, and function. The localization of parts and components is vital for the reducing of car production costs which will naturally lead to an expansion in product quantity. In addition, Indonesia's abundant supply of raw materials makes it suitable for the growth of basic material industry. It should keep in mind that the core of the Korean automotive industry policy was also the support of auto parts and material companies.

☐ Detail Practice Plan

1) Short Term (Building Production Bases for National Cars)

① Selection of National Cars

Indonesia needs to select national cars which could not only be sold commonly in Indonesia but also have short-term international competitiveness. According to these standards, the national car must be small with engine capacities ranging from 1,000cc to 1,500cc. Most developing countries produce and export small cars, with the most prominent example of China.

Korea's experience is also a good example. The "Long-term Promotion Plan of Automotive Industry" (1974) was crucial to Korea's automotive industry development. The core of the policy lay in the production of a small indigenous car with an engine displacement below 1,500cc. Small car production had a variety of merits including the simplification and stabilization of the production model, easy standardization and unification of parts, better likelihood for a mass production system, abundance in quality promotion, and the development of the export market, etc.

② Support Policy for Car Users

For the success of the national car policy, the Indonesian government needs to enforce several effective support policies for its sales. Reduction or exemption of taxes related with purchasing, holding, and car use is the most common policy method. Other methods include imposing a very high tax on other cars or promoting national cars. According to the “Long-term Promotion Plan of Korean Automotive Industry” (1974), the Korean government reduced ½ of consumption tax and 2/3 of car related tax to accomplish the national car sales goal defined as over 80% of car consumption. Generally small cars are environment friendly. Therefore the support policy for small cars is not a problem for the WTO regulation.

③ Selecting the Production Makers for National Cars

Car makers for national cars should have a vision for export. They must also have a plan for the localization of parts. These companies need to scout and cultivate Indonesian parts makers (ex. technology support plan). In addition they must have a specific training plan geared towards the further education of Indonesian manpower (training of skilled technicians, participation of Indonesian scientists in vehicle development). Finally, they must have strength in small car production. Car makers with an edge in cost and quality competition are appropriate for national small cars production. High-class small cars are not appropriate for the national car of Indonesia.

Considering the dominant position of Japanese car makers in Indonesia, it seems that their roles in producing national cars are inevitable. However, cooperation with Korean car makers might be a good alternative. In many areas of small car production, Korean makers (Hyundai, Kia, GM Daewoo, Renault Samsung) have better cost and quality competition than Japanese car makers. If Indonesia considers efficiency of competition and economy of scale, entry permission of two car makers for national car production is suitable.

④ Establishing Brand Car Makers

One of the success factors of Korean automotive industry is the presence of original brand car makers. Hyundai produced their own car model, localized parts, and exported their cars. Chinese brand car makers such as Geely, Chery, BYD, etc. also significantly contribute to

Chinese car export. Indonesia needs private entrepreneurs as the like of the late Chung of Hyundai, Geely's Li Shu Fu, BYD's Wang Zhuan Fu. The huge risk accompanying large amounts of investment motivates these entrepreneurs to put their best effort into car making. The Government must also support them concerning finance, marketing, international cooperation, etc.

Indonesian brand car makers need to set forth their original model. They can start by using outside technology. For example, Hyundai's first original model Pony used Italy's design, UK's plant, Japan's powertrain, etc. However, Pony was Hyundai's own original model, not produced by any other car makers. Now Chinese car makers are also using the same method.

⑤ Cooperation between Indonesian Brand Car Makers and Public Sector

Indonesian public research institutes have developed automotive engines, light car prototypes, and electric cars. However, the results of R&D are not being effectively utilized by the industry because most car makers are foreign. Therefore Indonesian brand car makers should make better use of the R&D results of the Indonesian public sector. The research institutes should also work towards developing Indonesia's own original car models. The role of the university as the educator of automotive engineers with bachelor degree is also critical for development.

⑥ Rigorous Localization Policy for Parts and Stable Labor Management

Korea also enforced a rigorous localization policy for auto-parts. The location of parts was the core of every Korean automotive industry policy changes in 1962, 1965, 1969, and 1974. Korea Auto Industries Coop. Association (KAICA) had the right to place import restriction on localized parts. KAICA not only provides supports for part localization but also supports starting businesses with investment funds, technology, information, etc. Currently, Korea is enforcing a very strong support policy for parts and materials.

The relationship between workers and management should also be maintained by effective and efficient coordination with the government. In this way, car makers can concentrate on production and sales with the support of solid labor force. Major industrial

conflicts in the Korean auto industry in the early 1990s were settled by the government's attempt to reform labor laws.

⑦ Cooperation Project between Korea and Indonesia

Indonesia can make an effort to induce Korean car and parts manufacturers. It can provide information about Indonesia (market prospect, government support policy, etc.) and request investment. Technological cooperation in the public sector networks is important. Technician training and parts technology transfer program by KATECH is a good example. In addition, since Korea's technology has been recognized as world best in LPG vehicles and Indonesia has abundant LPG resources, they can cooperate for the development and spread of LPG vehicles.

2) Long Term (Preparing for Production Expansion)

① Long- term Vision of Indonesian Automotive Industry (2020)

Indonesia needs specific goals to support increasing domestic demand, export, and production, part localization, and technology development. For example, auto production is estimated to grow to more than 2 million units in 2020 with the increase in national income, consumer demand, and new production bases. It could export 50% of its production to ASEAN countries, Australia, and Europe. Localization of auto parts can be achieved by further cultivating manufacturing technology, design technology, and vehicles core technology..

② Domestic Market Expansion Strategy and Export Support System

Transportations systems such as roads must be improved for the expansion of the domestic car market. Indonesia must construct new roads, introduce advanced transportation systems, and pass legislations related to safety driving environments. A finance system for the purchase of cars will help promotion.

The Indonesian government must also establish a professional export support system in preparation for future expansion. This include financial support (ex. trade finance), return of tariff on export products, and information and marketing support for parts makers.

③ Technology Support Institute and a Parts Maker Cluster

In the long-term, the most important component of the automotive industry is its production firms. These firms need to establish technology support institutes to support the manufacturers of auto-parts. This institute will take on technology development, professional training, and the distribution of cutting edge information.

Cooperation between firms by creating auto parts clusters is also essential. The clusters must be located in the vicinity of car production plants with the technology support institute in its center. The cluster must be equipped with various industrial infrastructures.

④ Eco-car Project

Indonesia has shown a lot of interest in eco-cars. The Indonesian Institute of Sciences (LIPI) has conducted R&D on electric cars since 1995, and has succeeded in developing an environmental friendly electric car, the so-called Marlip. LIPI has also developed a twin engine car using gasoline and electricity called “The LIPI 1st Electric Hybrid Vehicle.

However further R&D is needed for the electric and hybrid car models and they are yet premature for mass production or popularization. In addition, the global market for electric cars is very small. The production and sales of more efficient engine cars is much more urgent for Indonesia. By exploiting its abundant gas resources, development and production of LPG & CNG car seems a more realistic direction for Indonesia.

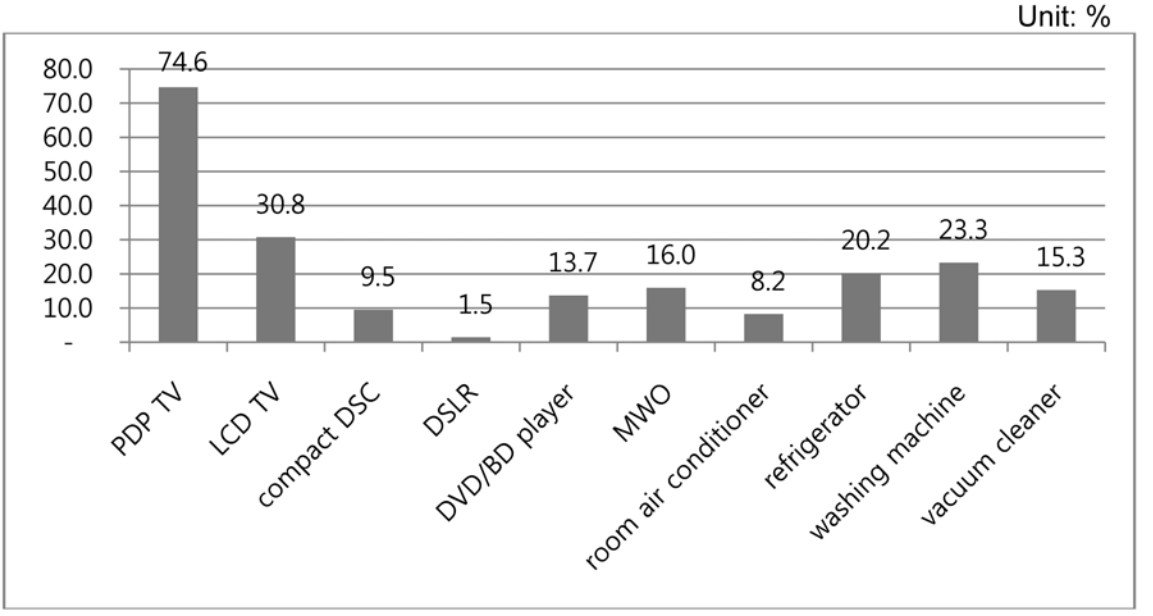
5-2. Consumer Electronics

5-2-1. Development of the Korean Consumer Electronics Industry

① Status of the Korean Consumer Electronics Industry

Korean companies lead the global consumer electronics market in the field of advanced digital video equipment and premium home appliances. Samsung Electronics and LG Electronics are ranked first and second in the global digital TV market from the Thirsd Quarter of 2006. LG Electronics has been ranked among the top four in the global refrigerator and washing machine markets. Korean companies produce consumer electronics all over the world accounting for 10～50% of world production with share of 75% on PDP TV, 31% on LCD TV, 23% on washing machine, 20% on refrigerator, 16% on MWO, and 15% on vacuum cleaner in 2012.

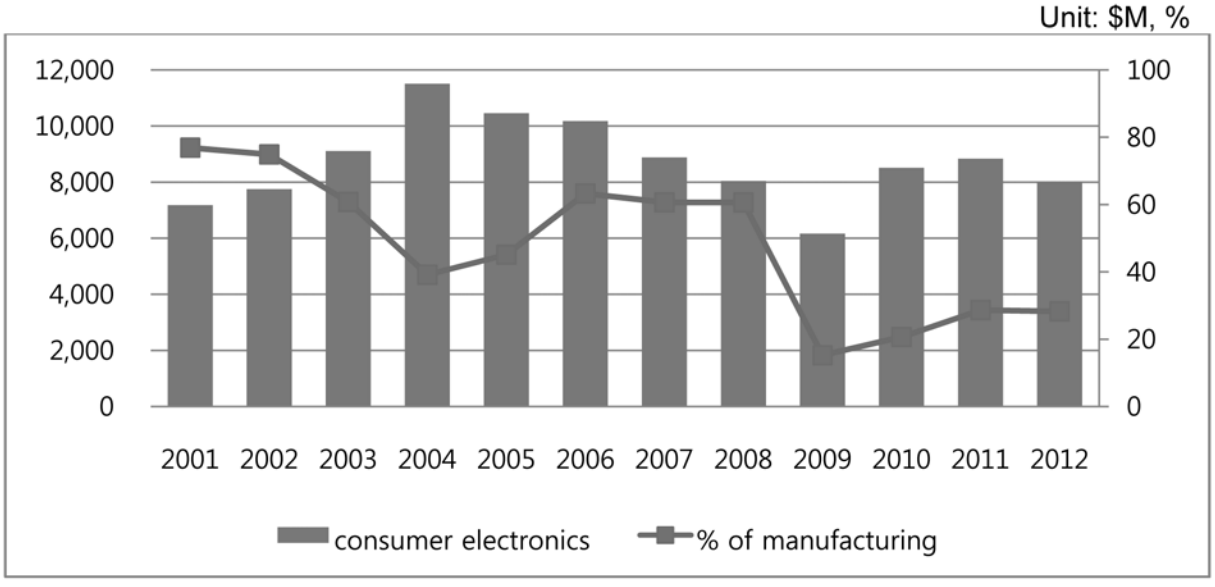
Figure 5-2-1 Korea's Share of the World Production by Commodity (2012)



Source: Fuji Chimera Research Institute (2012).

The Korean consumer electronics industry has recorded a trade surplus of USD 7-8 billion annually and has contributed to the entire manufacturing trade surplus with a share of 30% around. However, production in Korea is declining gradually as a result of expanding global production. Korean companies have moved their production bases from Korea to overseas in order to take advantage of low labor cost and to respond quickly to local demand. Most domestic production is for domestic consumption. The role of Korea in the consumer electronics industry is that of an R&D center for advanced technology based on excellent human resources and universities and research institutes.

Figure 5-2-2 Korean Consumer Electronics Industry Trade Surplus Trend



Source: Korea Trade Statistics

② Outline of the Development of the Korean Consumer Electronics Industry

The 1960s were the starting stage in the history of Korean consumer electronics industry. The Korea consumer electronics industry began from the first radio made by Goldstar (now LG Electronics) in 1959. During this time, the electric fan (1960), electric stove (1962), refrigerator, electric rice cooker (1965), black & white TV (1966), air conditioner (1968), washer, mixer, and toaster (1969) were produced for the first time.

The Big 3 (Goldstar, Samsung Electronics, Korea Wires) established a mass production system and tried to create a domestic market using technologies and core components transferred from developed countries such as USA and Japan. TVs, using more than 300

electronic components (condenser, resistor, CRT etc.), were the most important contribution to the consumer electronics industry development.

The 1970s were growing stage. Color TVs were developed. That became the cornerstone for leading the current global TV market. Companies derived localization of home appliances competitively and achieved a high level of localization. The government and companies both made efforts to expand exports and achieved USD 1 billion in exports (1979).

The 1980s were take-off stage. The circumstances of global consumer electronics market changed during the 1980s. Most U.S. companies exited and Japan companies began to dominate the global market. Korean companies expended into the overseas market with standardized mass products based on cheap labor and accumulated production technologies. Many R&D centers were established by companies which became the foundation to secure core and advanced technologies and patents. Korea rose to become the second country after Japan in terms of world production (1988) with an achievement of USD 5 billion in exports (1987).

Table 5-2-1 Growth-led Items by Period in the Korean Consumer Electronics Industry

1960s	1970s	1980s	1990s	2000s
radio, black & white TV	color TV, radio cassette, record player	VCR, color TV, color CRT , MWO, refrigerator, recorder	Large screen size color TV, VCR, MWO, CDP, DVDP, air conditioner, electric rice cooker, washing machine	LCD-TV, PDP-TV, MP3P, PMP, DMB, home theater, Digital camera, Drum-type washing machine, side-by-side refrigerator, system air conditioner

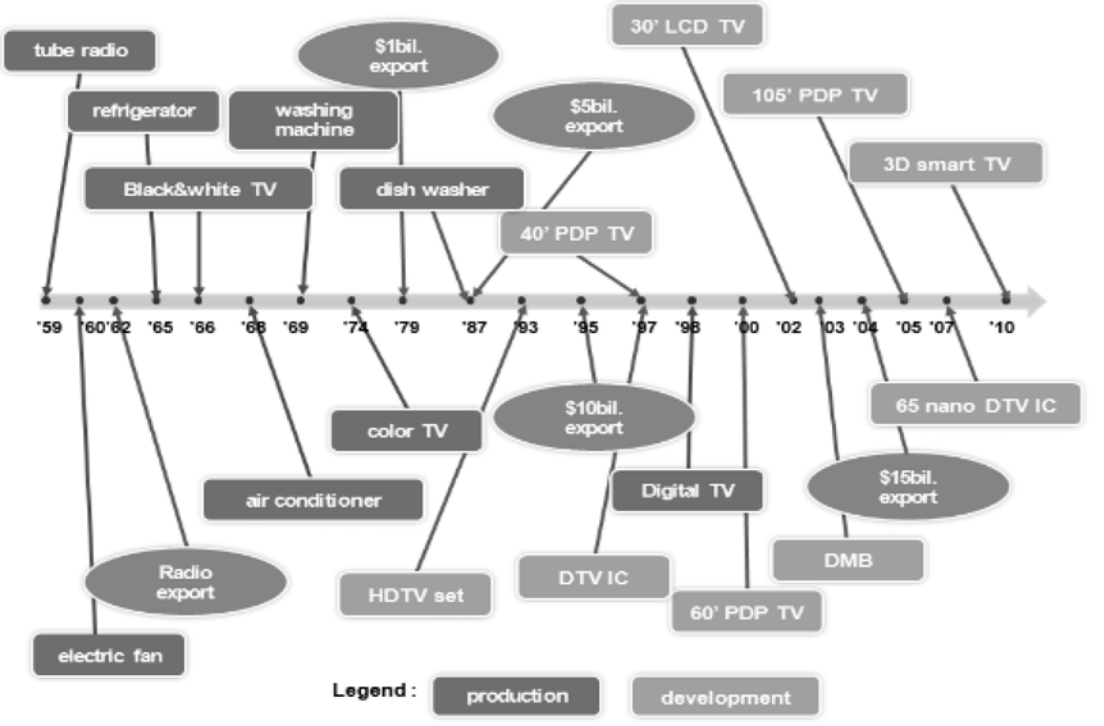
Source: KIET

The 1990s were the globalization stage. Korean companies expended overseas investment in response to restrictions on imports of developed countries. As a result, global production systems were established all over the world. Korean companies tried to reduce the time gap of new product development between Korea and developed countries and

developed the world's first products (HDTV sets, DTV IC, 40' PDP TV etc). During this time the Korean consumer electronics industry achieved USD 10 billion in exports (1997).

In the 2000s, Korea went from fast-follower to global leader. The circumstances of the global consumer electronics market changed from analog, stand-alone products to digital, network, converging products. Korean companies hold competitive advantage in the field of digital and converging products based on a lot of core technologies, patents and superior manufacturing technologies. Now, Korean companies lead the new digital TV market with the creation of the 3D smart TV, LED TV, and OLED TV. Also, the share of Korean companies in the world's home appliances market is steadily rising.

Figure 5-2-3 Development History of the Korean Consumer Electronics Industry



Source: KIET

③ Key Success Factors of the Korean Consumer Electronics Industry

Key success factors of the Korean consumer electronics industry can be found in three aspects including government policy, corporate strategy, and social infrastructure.

First of all, government policy had contributed to the development of the consumer electronics industry. Firstly, the government legislated laws to create domestic demand for radios and induced firms to enter the market during the infancy stage (1960s). The ban of importing radio parts which could be produced in Korea, sales ban of certain foreign products and campaign of sending radios to rural areas (1962) were undertaken by the law.

Secondly, the government enacted various acts and policies to foster the consumer electronics industry. The Five-year plan for development of the electronics industry (1966) and the Electronics Industry Promotion Act (1968) were typical policies. These created industrial infrastructure and contributed to the expansion of exports. Also, the establishment of the 'export zone' and inducement of foreign direct investment contributed to the accumulation of capital and advanced technologies.

Thirdly, the government drove various science and technology programs. Leading technology development projects (G-7) and joint government and industry studies (1992 through 2001) contributed to HDTV development for the first time in the world. Furthermore, science and technology programs were implemented such as the source technology roadmap project, new growth engine industry project, new frontier R&D project etc. The Korean 10 New Technology Award encouraged development motivation.

Fourthly, the government supported the electronics industry through various ways as follows: substantial tax benefits for R&D and product testing, plant improvement, facility construction, manpower development, considerable direct funding of projects in line with national priorities, low-interest loans, and duty-free imports of selected capital goods.

Finally, the government exerted leadership in cooperation with industries, education, and research institutes to promote development of sophisticated techno-culture.

Corporate strategy played an important role. OEM (original equipment manufacturer agreements) in the early stages to compensate for their own brand's lack of name recognition provided the opportunity to sell products abroad. Heavy investment in long-term R&D, plants, and manpower contributed to leading-edge industry breakthroughs. Namely, these include 2～3% of revenues into R&D, high percentage of researcher per employee, manufacturing excellence, acquisition of high technologies by establishment of R&D facilities in developed countries etc.

Korean firms pursued a globalization strategy and developed products specifically for individual market requirements. Also, Korean firms aggressively recruited foreign nationals and overseas Koreans with knowledge and experience in high-technology fields to speed up

technology transfers and increase technological self-reliance. Korean firms built up capability in a broad range of electronics technologies, including semiconductors (DRAM), displays (LCD, PDP), and core components.

Appropriate and effective CEO leadership by period was an important key success factor. During the 1960s, entrepreneur-style CEOs pioneered new businesses. During the 1970s～80s, CEOs expanded businesses in various fields. During the 1990s, administration-style CEOs pursued rationalization of business. During the 2000s, CEOs pursued restructuring in order to enhance organizational effectiveness.

Korean social infrastructure played an important role. Korea's economy grew rapidly and provided for the growing of Korean firms' consumer electronics market. Korean GNP per capita increased from $79 in 1960 to $12,000 in 1995 and recorded $22,500 in 2011. A well-educated workforce, well-qualified employees, and highly skilled and innovative engineers were critical in contributing to secure competitiveness. The Korean literacy rate is around 100%. Most high school graduates enter university and more than 30% of college graduates obtain advanced degrees. Koreans exhibit discipline, loyalty, pride and very hard work. Special facilities and training in electronics-related disciplines offered by science & technology education institutes and programs are sources of technology transfer and development.

5-2-2. Policy Recommendations for Indonesian Consumer Electronics Industry

① Entry Barriers of the Indonesian Consumer Electronics Industry

It is necessary to establish an electronics industry ecosystem for Indonesia to foster their consumer electronics industry. The electronic industry ecosystem is composed of R&D, component/chipset vendors, ODM/OEM, manufacturers, and retailers. However, it is very difficult to establish a healthy electronic Industry ecosystem for Indonesia because of multiple entry barriers.

In the electronics component industry field in Indonesia, huge investment, technology acquisition, and short technology life cycle act as major barriers to entry in the wafer fabrication sector. Also, the deficiency of critical mass in the fabless design house sector and shortage of market order in test/packaging sector are barriers.

Table 5-2-2 Entry Barriers of the Electronics Component Industry in Indonesia

Sector	Key Factors	Entry Barrier
Wafer Fabrication	– Investment (>3B USD)	✔✔✔
	– Technology Acquisition	✔✔
	– High Quality Human Resources	✖
	– Short Technology Life Cycle (< 3 years)	✔✔✔
Fabless Design House	– High Quality Human Resources	✖✖
	– Technology Acquisition	✖✖
	– Critical Mass	✔✔✔
	– Investment	✖
Test/Packaging	– Equipment	✖✖
	– Labour Availability	✖✖✖
	– Investment	✖✖
	– Market/Order	✔

Source: KIET (2012), The 2nd Joint Workshop Paper on Partnership for Industrial Development of Indonesia. Seoul, 2012.11

In the ODM/OEM industry field, deficiency of critical mass, lack of support from chip vendors and knowhow of product design & manufacturing act as main barriers to entry in the HW design house sector. In the SW design house sector, deficiency of critical mass and lack of support from chip vendors are barriers as well. Deficiency of load demand and lack of highly skilled engineers act as barriers in the PCB prototyping sector.

In the field of manufacturing, the deficiency of load demand, poor logistics and infrastructure act as substantial entry barriers.

It is necessary to enhance the competitiveness of vulnerable sector to establish the sound electronics industry ecosystem. In particular, the securing of robustness in the software design, system integrator, surface mount technology, and assembly sector is very important.

Table 5-2-3 Entry Barriers of the ODM/OEM Industry in Indonesia

Sector	Key Factors	Entry Barrier
HW Design House	- High Skilled PCB Designer	✔
	- Know How Product Design & Manufacturing	✔✔
	- Critical Mass	✔✔✔
	- Investment	✖✖
	- Support from chip vendor	✔✔✔
SW Design House	- High Skiller Embedded System Programmer	✔
	- Critical Mass	✔✔✔
	- Investment	✖✖
	- Support from Component Vendor	✔✔✔
PCB Prototyping	- Equipments	✔
	- High Skilled Engineer	✔✔
	- Load Demand	✔✔✔

Source: KIET (2012), The 2nd Joint Workshop Paper on Partnership for Industrial Development of Indonesia. Seoul, 2012.11

Table 5-2-4 Entry Barriers of Manufacturing in Indonesia

Sector	Key Factors	Entry Barrier
PCB/SMT/Assembly/ Casig/Test/Certification	- Load Demand (Mass Production)	✔✔✔
	- Equipments	✔
	- Operators (Labour)	✖✖✖
	- Investment	✖
	- Logistic	✔✔✔
	- Infrastructure	✔✔✔

Source: KIET (2012), The 2nd Joint Workshop Paper on Partnership for Industrial Development of Indonesia. Seoul, 2012.11

Table 5-2-5 Industry Priority for the Indonesian Ecosystem

Industry	Sector	Priority
Component	Fabless Chip	◕
	Test/Packaging	◖
	Chip Foundry	◔
ODM/OEM	Software Design	●
	System Integrator	●
Manufacture	Surface Mount Technology	●
	Assembly	●
	PCB	◕
	Casing	◔

Source: KIET (2012), The 2nd Joint Workshop Paper on Partnership for Industrial Development of Indonesia. Seoul, 2012.11

Notes: priority 1 ●, 2 ◕, 3 ◖, 4 ◔

② **Formulating a "Five-year Development Plan"**

At first, the Indonesian government needs to formulate a five-year comprehensive development plan and set up the target sector and goals. Taking into consideration the current average human resources capability and competitive advantages against developed countries and neighboring countries, in the next 10 years, the Indonesian government needs to foster the electronic components industry.

During the first five-year period, it would be desirable to focus on local electronic components manufacturing. Currently, most of the electronic components are imported and assembled under low wages and re-exported by global subsidiaries. If the Indonesian electronic components industry is developed, local content ratio and value-added of electronics can be increased.

During the second five-year period, it is necessary to focus on more sophisticated electronic components manufacturing and the ODM/OEM industry. Afterwards, another 5-year development plan will be needed sequentially for fabless industry, wafer fabrication industry and integrated design manufacturing.

Table 5-2-6 Five-year Development Plan

	2015	2020	2025
Plan	The first Five-year plan	The second Five-year plan	The third Five-year plan
target sector	electronic components industry (commodities)	electronic components industry (sophisticated) ODM/OEM industry	IC(fabless industry) Software/Design industry
Goal	-raising self-sufficiency rate: '12 ( )%→'20( )%→'25( )% -fostering indigenous SMEs : '12 ( )firms →'20 ( )firms→'25( )firms -job creation : '12 ( )people →'20 ( )people →'25 ( )people		
policies	-human resources development -technology development (R&D) -corporate support infrastructure (financial & non financial)		

Source: KIET

The Five-year Development Plan should contain specific goals indicated by the numbers. The Indonesian consumer electronics industry needs to achieve goals in the three areas such as raising self-sufficiency rate, fostering indigenous SMEs, and job creation during the five-year development period. The goal of raising self-sufficiency rate of consumer electronics industry should be represented by period.

Also, it is necessary to suggest appropriate policies for human resources development, technology development (including R&D), and corporate support infrastructure (financial and non financial) in the Five-year Development Plan.

③ Developing Human Resources

Currently, the strategies and policies for human resources development in Indonesia are not tightly related to MP3EI. Therefore the Indonesian government should connect MP3EI concretely to strategies and policies for human resources development and develop the necessary education and technology.

Also, currently the centralized education and training system of Indonesia does not fit the demands of the market and is not well aligned with electronic industrial needs. The

electronic industry requires a highly educated and skilled labor force with a fair amount of mobility. In order to do that, Indonesia could consider benchmarking Korea's success in enhancing competitiveness through an effective education system. Korean strategies of human resources development could serve as reference points for Indonesia. It would be a useful exercise to adapt Korean education policies to the Indonesian situation.

Indonesia should establish demand-driven technical institutions and training centers that can provide workers practical training in areas such as production control, quality control, design development, and metal mold making etc. Also, the Indonesian government needs to expand its national qualification certification system so that it can contribute to the improvement of the employees' technical expertise and career development. It is necessary to improve the education level through matching school curriculum to industry needs.

Furthermore, the Indonesian government should increase the education budget, which is currently significantly smaller than the oil subsidy. Through education budget expanding, the Indonesian government should raise both the percentage of middle school graduates entering high school and the percentage of high school graduates entering university.

④ Driving the Science and Technology Projects

The Indonesian government should conduct medium & long term science and technology development projects of the electronics industry at the national level such as the technology development roadmap, leading technology development project, joint study between government and industry etc. These projects exerted large impact on the development of the Korean consumer electronics industry.

Indonesia should firstly select high-priority technologies considering the current technology level and the competitiveness of the Indonesian electronics industry. Then, the Indonesian government should make technology roadmap including value-chain analysis, technology tree analysis, technical characteristics, product development cycle, types of research and development, development schedule, and budget etc. In order to prepare a technology roadmap, it is necessary for the Indonesian government to cooperate with the industry, academics, and research institutes.

Most importantly, the Indonesian government should input large-scale R&D expenditure into universities, research institutes, and industries in order to help develop advanced technology. Indonesia does not provide incentive systems that support the development of

R&D. The process of R&D must combine elements of academics-business-government in order to achieve the goal of R&D effectively.

Also, it is very important to build conditions that will contribute to the development of science and technology. It is necessary to establish government-funded special science & technology education institutes, R&D organizations, and training facilities. In particular, government-funded R&D organizations are needed because they act as sources of technology transfer and development. To build techno-parks which are associated with industrial complexes is needed. In Korea, ETRI (Electronics and Telecommunications Research Institute) and KAIST (Korea Advanced Institute of Science and Technology) have contributed greatly to the development of the electronics industry.

⑤ Building Corporate Support Infrastructure

It is necessary to build up financial and non-financial corporate support infrastructures in order to move up the electronics industry value chain through developing manufacturing capability of indigenous SMEs.

First, it is necessary to establish public support institutions for SMEs in the field of technology, finance, and marketing etc. The technology support institutions can provide test facilities for SMEs at a low cost. Also, SMEs can get certification advice, low interest loans, and overseas exhibition participation support from adequate support institutions. These support institutions can help to ensure quality control and to accelerate diffusion of technological knowledge and new products, and can raise viability of SMEs rapidly.

Second, establishment of consulting agencies such as implementation of ISO standards and ERP is needed to improve product quality and production efficiency. If the Indonesian government gives subsidies to these agencies, SMEs can receive pertinent advice from them at a low cost.

Third, it is necessary to strengthen the linkages between SMEs, universities and research institutions in order to accelerate knowledge transfer. The absence of support from the domestic knowledge infrastructure is a main factor that restricts learning process and capability formation at the industrial level.

Fourth, the Indonesian government should enhance technology development cooperation between components SMEs and large-scale assembly companies. Currently, most of electronics components are imported, assembled using low wage mainly in Batam, and re-

exported due to lack of local components SMEs. In order to accelerate development cooperation, it is desirable to provide tax incentives for large-scale companies which implement cooperative research projects with SMEs. Another incentive is to give large-scale companies priority to participate in nation level research programs.

⑥ Introduction of Incentive Schemes and Deregulation

The Indonesian government should introduce incentive schemes to induce investment from both local and foreign companies. It is a very important policy to accumulate capital and to acquire advanced technologies. A typical type of incentive scheme includes substantial tax benefits for R&D, product testing, plant improvement, facility construction, and manpower development.

Also, the considerable direct funding of projects in line with national priorities will be an effective incentive. Furthermore, low-interest loans venture/start up financing and duty-free imports of selected capital goods will give companies motivation to enter into the electronic industry and to enlarge investment.

The Indonesian government should simplify the bureaucracy and deregulate trade barriers to reduce the burden of companies. Currently, policy enforcement authority in Indonesia is divided into the central government and the provincial government. This makes it difficult for companies to carry on business in various aspects.

Meanwhile, according to a research paper[21], infrastructure is the most important determinant in developing countries, followed by labor quality and FDI openness. Therefore, The Indonesian government should construct infrastructures such as transport network, electricity supply, and telecommunications in particular.

[21] Moekti P. Soejachmoen(2012), "Globalization and the Electronics Industry : Is Indonesia Missing Out?" The 13th International Convention of East-Asian Economic Association, Oct. 19-20 2012.

5-3. Shipbuilding

5-3-1. Lessons of the Korean Shipbuilding Industry

① Compressed Growth and the Most Adequate Mentor for Indonesia

Through aggressive investment, Korea came to rank the second in the world shipbuilding industry in the year 1979. In the 1970s, the Korean economy was very similar to that of Indonesia. Through continued development however, the Korean shipbuilding industry rose to the top in the 2000s. This created many new employment positions and positively affected both the upstream and downstream industries. Once Korea took the leading position, Korean shipbuilders put their effort into diversifying their product mix and further developing high value added ships. They worked towards this goal by selectively participating in bids according to their hurdle rate and product mix.

Table 5-3-1 Development Process of the Korean Shipbuilding Industry

	1970s (Entry stage for the global market)	1980s (Growth stage)	1990s (Leaping stage)	2000s (Leading stage)
Technology for Shipbuilding	- Lack of skill and technology - Imitation of advanced technology	-Construction of infrastructure for technology development -Acquisition of advanced technology	-Intensified technology development -Application of advanced technology	-Independent technology development -Emphasis on value-added ships -Reinforcement of inland building capacity -Innovation of construction methods
Ship Equipment	- Weak infrastructure - Dependent on imported equipment	-Selection of main equipment companies -Home production policy for parts and materials (Top-down type)	-Expansion of home production for parts and materials -80% domestic supply for equipment	-Increase in the production of ship equipment - 90% domestic supply - 85% loading of domestic equipment by owner
Major Ship-type/ Completion (GT)	-Product carrier (135,000) -Tanker	-Product carrier (0.4mil.) -Tanker (140,000)	-Tanker (2.1mil.) -Bulker(1.8 mil.) -Product carrier(0.3mil.)	-Tanker (5.5mil.) -Container ship (9.2 mil.) -Product carrier

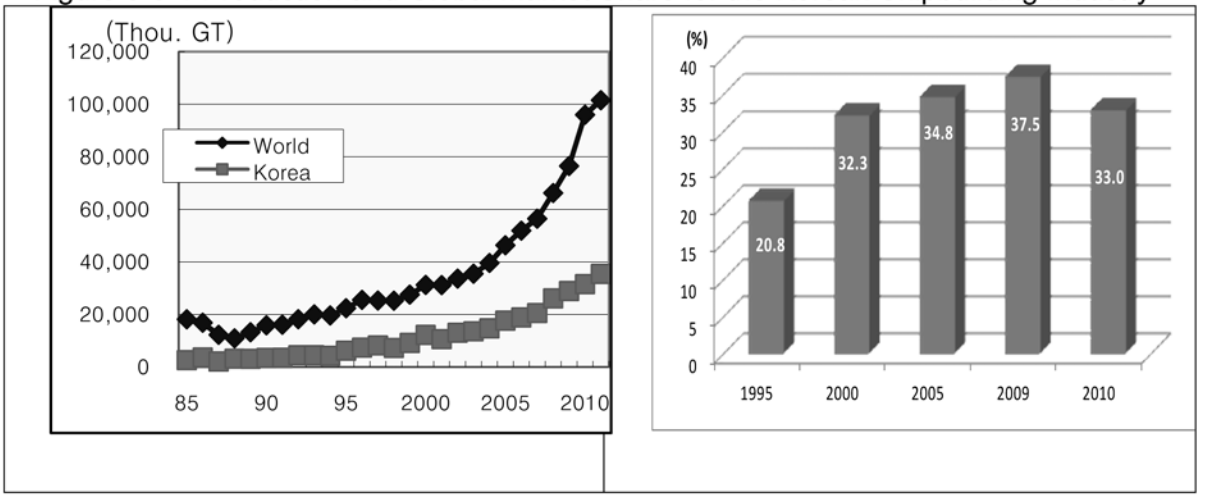
	(130,000) -Bulker (110,000)	-Bulker (1.3 mil.) -Container ship (0.5mil.)	-Container ship (1.2 mil.)	(3.5mil.) -LNG/LPG carrier (2.7mil.)
Value Chain	-Large facilities	-Aggressive marketing	-Expansion capacity -Development of vessel types and design technology	-Innovation of construction method -Expansion capacity for medium sized vessels
Industry Strategy	-Increasing the market value ratio by using modern and large facilities, and aggressive marketing -Securing of production and design technology national registered ships		-Expansion capacity -Technology Improvement -Intensified technology development	-Continuation of technology based price competitiveness -Differentiation strategy for high value-added ships

Source: KITECH (2011), *Korea-Indonesia Shipbuilding Industry Cooperation Plan*

② Outcome of the Korean shipbuilding industry

The Korean shipbuilding industry maintained the position of global leader in the 2000s, surpassing Japan in terms of both annual new order and the value of the order book in 2000. Preceding the financial meltdown in 2008, the healthy global economy and the rapid growth of the Chinese economy led to 35% CAGR in shipbuilding orders in terms of CGT. Naturally, production of the Korean shipbuilding industry increased dramatically. Global market share also expanded from 20.8% in 1995 to 37.5% in 2009.

Figure 5-3-1 Production and Global Market Share for the Korean Shipbuilding Industry



Source: Lloyd (2011), *World Shipbuilding Statistics*

In the 1980s, Korea's major vessel type was the bulker which composed 49.1% of the production. In the 2000s the major vessel types were the tanker, container ship and LNG carrier. Bulkers are relatively simple to design while full container ships and LNG carriers are on the more complicated side for merchant fleets.

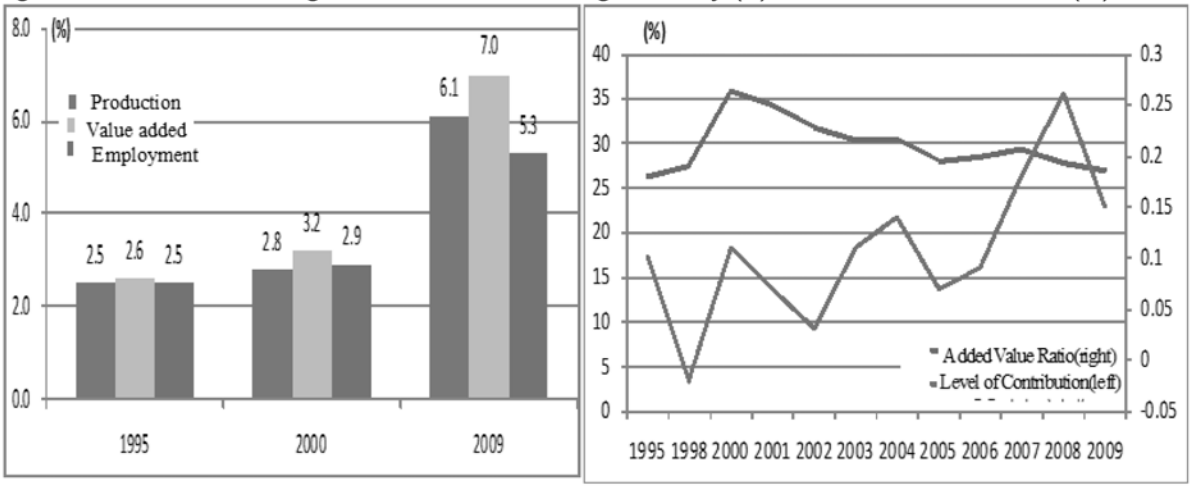
Table 4-3-8 Major Shipbuilding Vessel Type and Production by Decade

	Bulker	Tanker	Container ship	LNG carrier	Remarks
1980s	49.1	20.2	16.5	-	1985
1990s	31.0	42.0	20.7	-	1995
2000s	1.4	44.3	36.8	11.5	2005
Recent	1.2	32.4	30.1	25.4	2008

Source: Lloyd(2011), *ibid.*

As industry production boomed, the ratio in the manufacturing industry also increased. The production ratio changed from 2.5% in 1995 to 6.1% in 2009. Value added ships and employment ratios underwent similar growth.

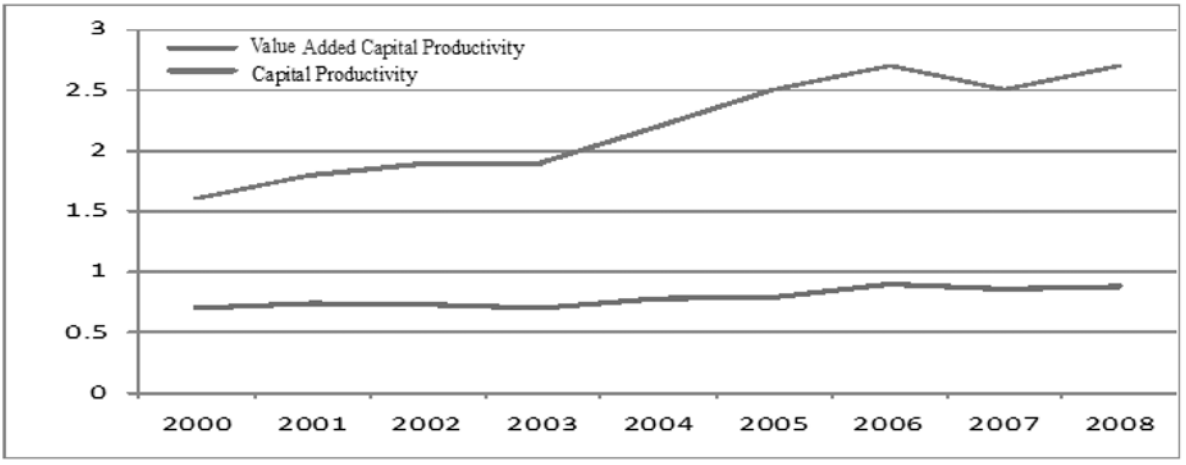
Figure 5-3-2 Ratio Change in the Manufacturing Industry (L) and Contribution Level(R)



Source: Bank of Korea (2010), *National Accounts*

The capital productivity of the Korean shipbuilding industry has continuously increased from 2000. However, value added capital productivity was stagnant or only slightly increasing during the same period with a CAGR of 2.9%.

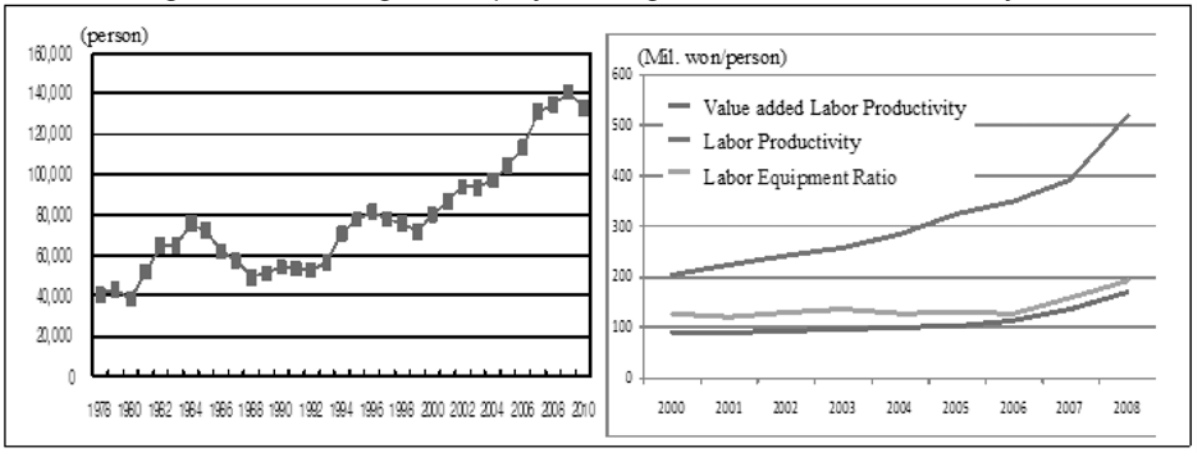
Figure 5-3-3 Capital Productivity of the Korean Shipbuilding Industry



Source: KIET (2011), *Key Indicators of Major Industries*.

Employment figures in major shipyards doubled from 1990 and became about 140 thousand people in 2011. However as new orders decreased this figure has started to drop. The labor productivity of the Korean shipbuilding industry increased since 2000 with a CAGR of 12.3%. In addition, value added labor productivity and labor equipment ratio slowly increased during the same period.

Figure 5-3-4 Change in Employment Figures and Labor Productivity



Source: KIET (2011), *Key Indicators of Major Industries*

The shipbuilding industry is not only capital-intensive but also labor-intensive. Its labor-intensive characteristic reveals itself in the high total employee requirement coefficients. The coefficient has decreased since 2000, but it was always bigger than the manufacturing industry.

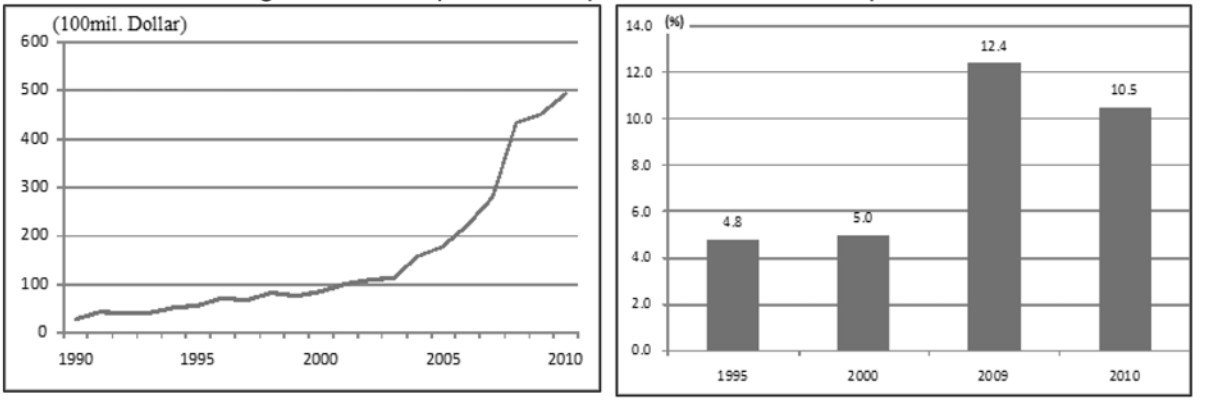
Table 5-3-2 Change of Total Employee Requirement Coefficients

	2000	2003	2005	2008	2009
Shipbuilding	13.1	10.6	8.5	9.1	10.0
Manufacturing	10.37	9.17	7.93	6.08	6.35

Source: Bank of Korea(2010), *Input-Output Tables of Korea*

The export index of Korea in the year 2011 registered an increase of approximately 15.2% compared with the previous year. The actual value was USD 56.6 billion which recorded the greatest performance ever. However, the export ratio peaked in 2009.

Figure 5-3-5 Export and Export Ratio for Total Export



Source: Kotis.net

The world merchant shipbuilding market is dominated by Korean shipbuilders in terms of top builders, new orders, and completions. In 2009, it still kept the lead position in the shipbuilding industry in terms of new orders and completions. In 2011 however, China stole the leading position by increasing its market share.

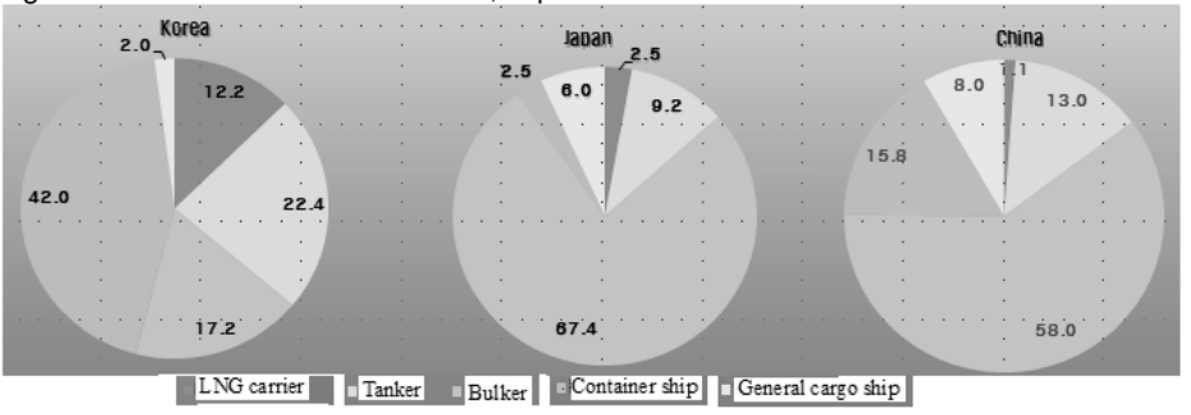
Table 5-3-3 Status Change of Korean Shipbuilding Industry in the World

		1995	2000	2005	2009	2011	Average Annual Increase (%) (1995~2011)
World Market (10 Thou. CGT)		1,468	2,004	2,897	4,369	5,104	8.1
Completion (10 Thou. CGT)	Korea	305	648	1,009	1,447	1,580	10.8
	Japan	576	641	831	961	916	2.9
	China	76	114.5	419.4	1,239	1,920	22.4
Share of the world market (%)	Korea	20.8	32.3	34.8	33.1	31.0	-
	Japan	39.2	32.0	28.7	22.0	17.9	-
	China	5.2	5.7	14.5	28.4	37.6	-
Ratio relative to other country	Korea/Japan	0.5	1.0	1.2	1.5	1.7	-
	Korea/China	4.0	5.7	2.4	1.2	0.8	-

Source: Lloyd (2012), *World Shipbuilding Statistics*

However, Korea still holds the market lead in relatively sophisticated ship types such as large containers, gas carriers, and offshore plants. For now, it is apparent that China lacks a presence in the premium product category.

Figure 5-3-6 Order Book Mix of Korea, Japan and China in 2011



Source: Lloyd (2012), *World Shipbuilding Statistics*

The top 10 shipbuilders in the world in terms of order book (CGT) are 6 Korean companies, 4 Chinese companies and one Japanese company. Amongst the global shipbuilding industries, Korea dominates followed by China and then Japan.

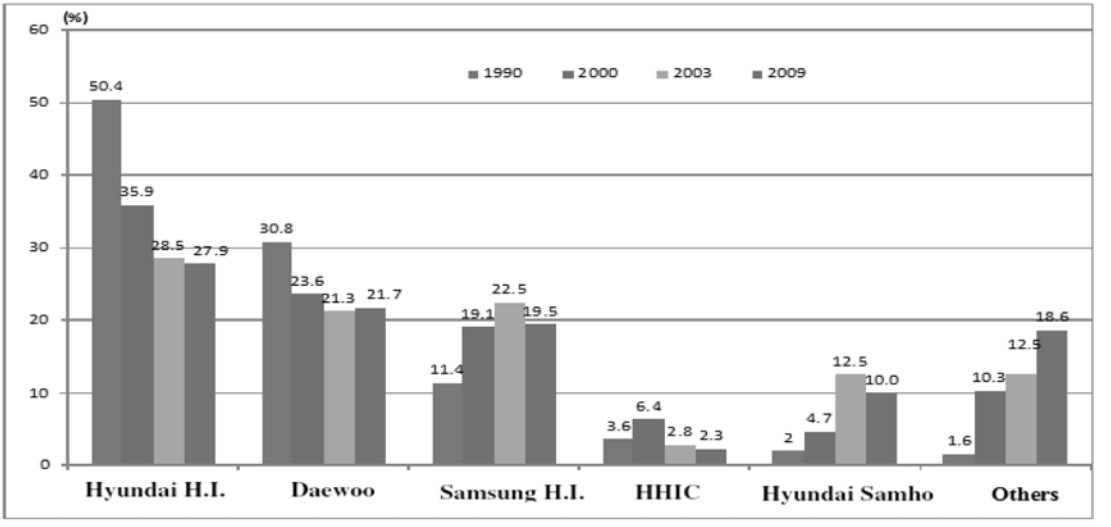
Table 4-3-4 World Top 10 Companies in the Shipbuilding Industry

Company Ranking	Order Book (10 Thou. CGT)	World Market Share (%)	Completion (10 Thou. CGT)	World Market Share (%)
1. Samsung H.I.(Korea)	640	6.7	297	5.9
2. Daewoo(Korea)	533	5.6	274	5.5
3. Hyundai H.I.(Korea)	476	5.0	301	6.0
4. STX S.B.(Korea)	347	3.6	117	2.3
5. Hyundai Mipo(Korea)	279	2.9	143	2.8
6.Jiangsu Rongsheng(China)	275	2.9	45	0.9
7. Hyundai samho(Korea)	270	2.8	175	3.5
8. Oshima S.B.(Japan)	202	2.1	66	1.3
9.Hudong Zhonghua(China)	174	1.8	49	1.0
10. Jiangsu New YZJ(China)	159	1.7	65	1.3

Source: Clarkson (2012.10), World Shipyard monitor

In terms of supply market share per completion, HHI is still the number one Korean shipbuilder, followed by DSME and then SHI.

Figure 5-3-7 Supply Market Share of Korean Major Shipbuilders



Source: Korshipa (2012), *Shipbuilding Yearbook.*

R&D manpower of the Korean shipbuilding industry is composed of shipyards' R&D and KIOST (MOERI). There are also RIMS (Research Institute of Medium and Small shipbuilding) and KOMERI (Korea Marine Equipment Research Institute), but the main R&D center of the Korean shipbuilding industry is KIOST (MOERI). Also, every major yard has 1,000~2,000 engineers and designers, and thus is able to build any type of vessel according to the market demand. The favored ship type of the market changes frequently every year. Strong engineering skill is important to maximize profit opportunity by changing the product mix according to the versatile market demand.

Table 5-3-5 R&D Manpower in the Korean Shipbuilding Industry

		1995	2000	2003	2005	2008	2010
Shipyards	Doctor	60	83	97	123	128	209
	Master	359	176	544	677	696	848
	Subtotal	419	259	641	800	824	1,057
KIOST (MOERI)	Doctor	27	33	49	67	71	71
	Master	29	34	26	20	25	27
	Subtotal	56	67	75	87	96	98
Total		475	326	716	887	920	1,155

Source: Korshipa (2012), *Shipbuilding Yearbook.*

Although the R&D expenditure by major shipbuilders increased every year, it still remains insufficient in ratio of sales. The ratio decreased from 1.23% in 2000 to 0.69% in 2011.

Table 5-3-6 R&D Expenditure by Major Shipbuilders

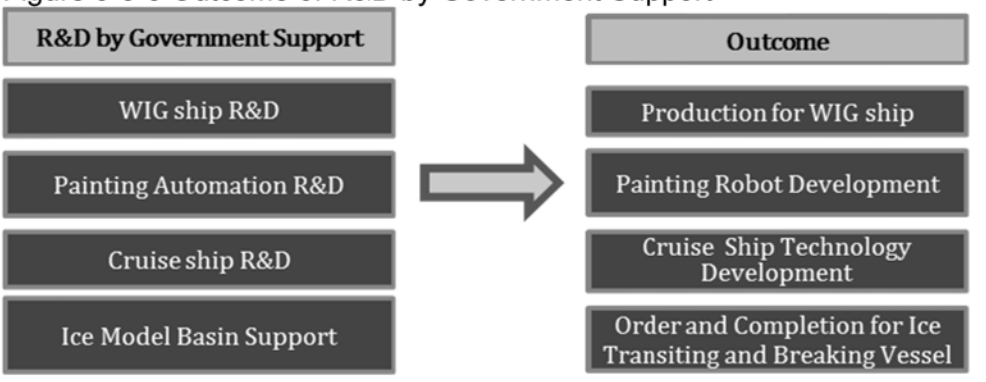
	2000	2003	2005	2008	2011
Sales(A)	97,145	136,041	182,720	345,470	355,810
R&D(B)	1,196	1,563	1,212	1,825	2,452
(B)/(A)	1.23%	1.14%	0.66%	0.53%	0.69%

Source: Korshipa(2012), *Shipbuilding Yearbook*

In the case of government supported R&D, the results are diverse and plentiful. For example, WIG ship R&D has led the commercialization of WIG ships, and the painting robot

development was support by the painting automation R&D. Especially, the construction for ice model basin has helped to make possible new order and completion of ice transiting and breaking vessels.

Figure 5-3-8 Outcome of R&D by Government Support



5-3-2 Master Plan for the Indonesian Shipbuilding Industry

① Evaluation of the Foundations of the Indonesian shipbuilding industry

In the production sector of the national shipbuilding companies in Indonesia, for example DKB and PT. PAL, the efficiency of the production process is seen to be generally low. Steel plates are wasted, pre-outfitting and unit-outfitting have meager yields, and tasks are unbalanced or bottle-necked. DKB is able to design small ships such as ferries but mostly outsources its basic designs and manufacturing. Due to the outsourcing of basic designs, it is not easy for them to estimate exact demands for equipment purchase. Furthermore, the cost is high because they keep purchasing necessary articles according to every building situation. To make matters worse, raising productivity is difficult due to their poor automation system and old facilities. Overall, the poor system and stopgap management of the production make it difficult to improve the competitiveness

The largest Indonesian national shipbuilding enterprise, PT. PAL had 6,000 employees 6 years ago but has about 1,500 employees now. They have cooperated with Korean companies such as HHI, Daesun, and DSME. They have the experiences of building 60m patrol ship, 5,000 TEU container carriers, and the detail design for chemical tanker using

Tribon. However, they only have 100 people in the design center and opt to purchase designs instead of drawing them.

The equipment field is much weaker. Most engines, machineries, maritime navigations and communication equipment depend on imports. About 20% of equipment such as pipe, steel plate, generator, engine, and pump are imported from Korea, Japan and China. It supplies about 20% of the steel plates from Hamcracao steel (Indonesian steel company) and domestic equipments. Only steel plates under 2.5m were transported by land because of the restriction of the road (9m x 1.8m x 30mm).

In the designing field, only a few shipyards do their production design by themselves, and most shipyards depend on the design companies in Japan and Singapore for basic and detailed design. They have designed not so complex vessels such as small and medium tanker and bulker but still mostly depend on imported design. It is evaluated that their developing capacity in design is still weak even though they use auto CAD and Tribon for design tools. Their design technology level is about 20% of Korea and inferior to Vietnam and Singapore.

② SWOT analysis and strategies

Due to the rapidly increasing labor cost of China, Indonesia with its cheap and abundant labor force is expected to be a post-China production base in the world shipbuilding industry. Though it has low competitiveness in the shipbuilding industry, it has the 4th largest population in the world and its rich natural resources will become a good foundation for shipbuilding industry development.

The strength factors of the Indonesian shipbuilding industry are richness in experience for small and medium size vessels, abundant and cheap wage labor force, strategic location such as the Strait of Malacca and proximity with Singapore and Malaysia, and industrial policy pushed by the government. The weak points are small shipyards, old facilities and weak shipbuilding infrastructure, weak equipment and material supplier, low design and engineering capability for big sized vessels, and poor financial investment condition.

Table 5-3-7 SWOT Analysis and Its Strategy for Indonesian Shipbuilding Industry

		Strength	Weakness
		-Rich in Experience for Small & Medium size Vessel (Ferries, Multi-purpose vessels, etc.) -Abundant and Cheap wage labor force -Strategic location(Strait of Malacca, Clustering with Singapore and Malaysia) -Government Industrial Policy	-Small shipyards, Old facilities and Weak Shipbuilding Infrastructure -Weak Equipment and Material supplier -Low Design and Engineering Capability for Big Sized Vessels - Poor Financial Investment Condition
Opportunity	-Abundant Domestic Demand -Inter-island connectivity needed -Post-China shipbuilding base (abundant and cheap labor force)	S-O Strategy -Enhancing Design and Engineering Capability -Formation for Shipbuilding Industry Cluster -Working for Design Manpower Training Program	W-O Strategy -Strategic Partnership for Design Technology Development -To Build Efficient Work System for High Productivity -Modernize Production Facility and Improving Performance
Threat	-Excessive Competition of Global shipbuilding industry -Subordination by Singapore Shipbuilding -Weak Initiatives by Production Facilities of Foreign Shipyards	S-T Strategy -Localization Strategy for Ship Equipments -Self-supporting Strategy for Design Technology -Active Domestic Investment	W-T Strategy -Inviting of Foreign Equipment company -Saving of Production Cost by Process and Quality Management -Manage for Supply-chain

Opportunity factors are abundant domestic demand, inter-island connectivity and assessment for Post-China shipbuilding base (abundant and cheap labor force). The threat points are excessive competition of global shipbuilding industry, subordination by Singapore shipbuilding, and weak initiatives by production facilities of foreign shipyards.

On the base of SWOT analysis, strategies that mix each factor are as follows;

First, the S-O strategy with a mix of strength and opportunity factors is to enhance design and engineering capability, forma shipbuilding industry cluster and work towards training design manpower.

Second, the W-O strategy is a strategic partnership for design technology development in order to build an efficient work system for higher productivity, modernizing production facility, and improving performance.

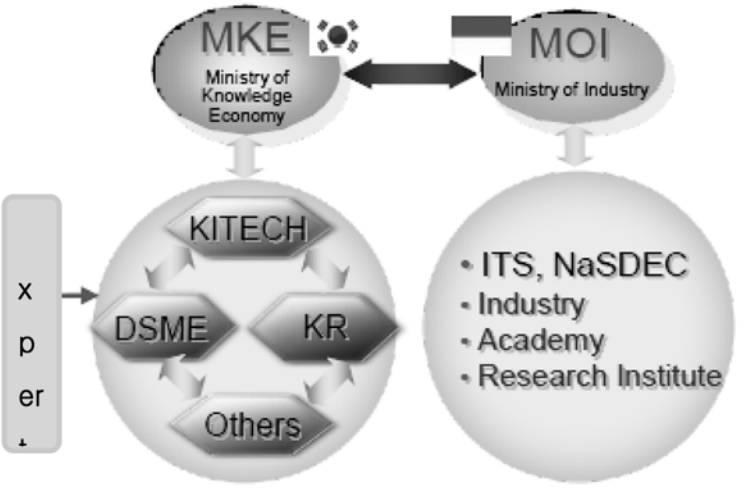
Third, the S-T strategy is a localization strategy for ship equipments, self-supporting strategy for design technology, and active domestic investment.

Finally, the W-T strategy is invitation of Foreign Equipment companies, saving of production cost by process and quality management, and better management of the supply-chain.

③ Recommendation for Indonesian Shipbuilding Industry Development

For recommendation for the Indonesian shipbuilding industry development, refer to the Korea-Indonesia Shipbuilding Industry Cooperation Plan conducted in 2011 by the Korean MKE (Ministry of Knowledge and Economy), KITECH (Korea Institute of Industrial Technology), KR (Korea Register of Shipping) and DSME (Daewoo Shipbuilding & Marine Engineering Co.). The report includes the contents of shipbuilding industry cooperation such as governmental cooperation, cooperation of marine equipment and service fields and cooperation between private companies with Indonesia and Korea. The cooperation agendas consist of four parts: the master plan for shipbuilding industry cooperation, building cooperation network among industry, academy, industry research, joint participation in practical research and business-oriented projects, and exchange of personnel and technical information.

Figure 5-3-9 Shipbuilding Industry Cooperation Network



Source: Korea Ministry of Knowledge Economy (2011), Korea-Indonesia Shipbuilding Industry Cooperation Plan

The main direction of the long term development strategy is the base of the shipbuilding industry development road map by the Indonesian government. The short-term strategy involved the settlement of the production base by selection and focus strategy backed by abundant domestic demand. To enhance local capability, it needs to construct the industrial base by cooperation and support from foreign advanced shipbuilding country. The mid-term strategy is the reinforcement of the engineering base for enhancing capability of technology, manpower and equipment part. The long-term strategy is the independence of technology and expanding export for bigger vessels such as the bulker and tanker. Through these strategies, the 2025 vision ‘Global top 10’ by the Indonesian government will be a success. This signifies over 80% of technology independence and securing of over 60% self-reliance of shipbuilding equipment and material, etc.

Major vessels are focused on two tracks, not only simple and big demand vessels such as bulker and tanker for export, but also small and mid-sized vessels for the abundant domestic demand such as ferry, ro-pax and cruiser, etc.

Table 5-3-8 Development Road Map for Indonesian Shipbuilding Industry

	Short-term	Mid-term	Long-term
Period	2013~2015	2016~2020	2021~2025
Target	Settlement Production Base	Reinforcement of Engineering Base	Independence of Technology and Expanding Export
Detail Goals	- Modernize/systematize production facilities -Systemize HRD system -Localize production of parts and materials for shipbuilding	-Upgrade shipbuilding system -Expand shipbuilding capacity of high value-added ships -Enhance performance and quality of parts and materials for shipbuilding	-specialize and export medium sized vessels -Over 80% degree of technology independence -Secure over 60% of self reliance on shipbuilding equipment
Major Vessels	-New manufacturing of tanker and bulker (Handymax class) -Small and medium sized Ro-Pax -Repair and refurbish of Small and medium sized ships	-New manufacturing of 100,000DWT class tanker and bulker -4,000 TEU-class container ship -Small and medium sized ferry -Repair and refurbish medium and large sized ships -Prepare to refurbish and dismantling for offshore plant	-Mass production of 100,000DWT tanker and bulker -New build 6,000TEU container ship -Small and mid. Sized luxury ferry and high-speed cruiser -Build offshore plant and LNGC
Shipbuilding Technology	-Import and replicate design for production technology -Import and application for design technology	-Expansion of production process automation -Design process automation by IT base -Settlement of R&D base	-Localize design and production technology for mid. Ships -Design and production of offshore plant -IT base design and automation of production process
Human Resource Development	-Utilize and procure external education system -Train instructors by dispatching to overseas training programs -Establish training programs	-Development and manage of technical manpower training system(Establish technical education institute) -engineer training and development system	-Localize design manpower training program(develop customized training program) -Train and expand R&D manpower
Equipments	-Depend on outside procurement -Invite foreign investment and joint ventures	-Localize steel outfitting and install in local ships -network of production(import and assemble for main equipments) -Activate ship equipment cluster	-Localize general-purpose equipment -Localize production base for offshore plant equipment

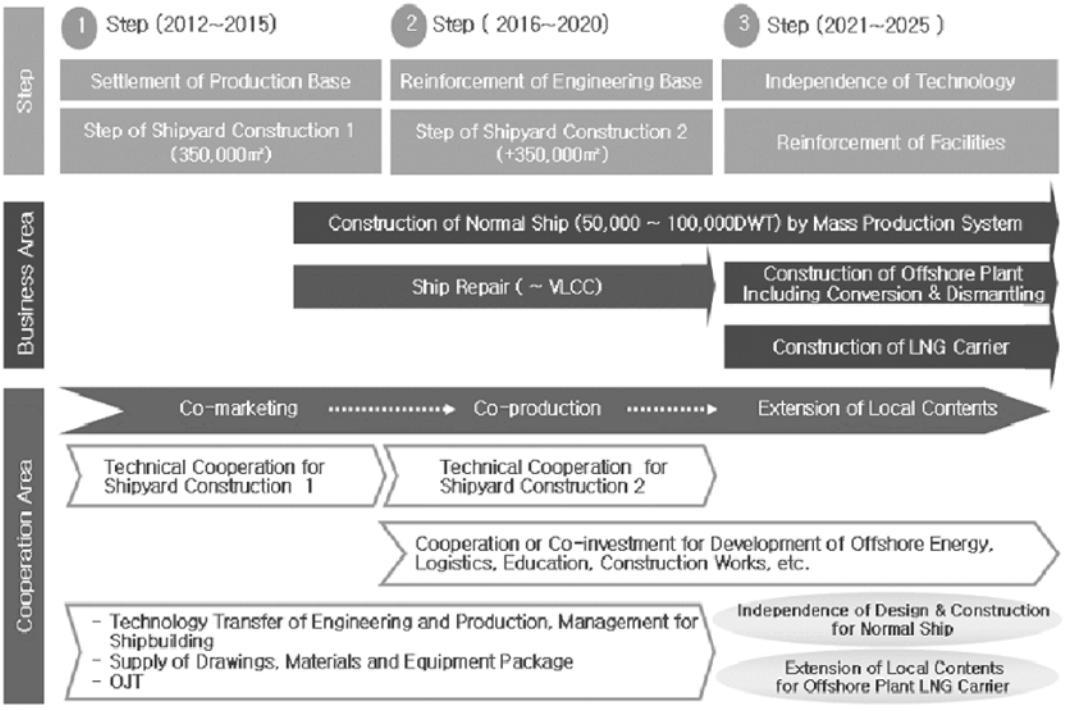
Source: Korea Ministry of Knowledge Economy (2011), *Korea-Indonesia Shipbuilding Industry Cooperation Plan*, Indonesia Ministry of Industry (2011), “Overview of shipbuilding Industry in Indonesia”

Fostering the shipbuilding industry as the key government industry of Indonesia is expected to contribute to balanced regional development, establishment of S.O.C and infrastructure, narrowing the gap between rich and poor, and increasing the technical and educational level. To enter the inter-government shipbuilding market stably after Post China Indonesia needs to establish differentiated strategies from the Singapore model which focuses on repair and retrofit of ships, construction of special purpose ships and small size offshore plants. About three main government shipbuilding enterprises need to actively participate in the construction of the AFRAMAX class vessel that is up to 100,000 DWT, offshore plants, LNG carrier, and large sized ship repair. It is the entry strategy for medium-sized vessel market. A new medium size shipyard of 700,000m2 in Indonesia will be developed through three steps. The first step is to develop an area of 350,000m^2 and the second step is to add 350,000m^2 to it. It needs USD 250 million dollars for the 1st step and USD 350 million dollars for the 2nd step. Total investment expenditure is expected to amount to USD 600 million dollars. The third step pertains to adding facilities without site enlargement.

The shipyard will actively participate in ship repair and the medium size ship construction market with mass production system after the first step is completed in 2015. The second step will be completed in 2020. It will enter offshore plants repair, retrofit and dismantling market after the third step is finished.

For this project, Indonesia needs to establish cooperative relations with Korean shipbuilding companies in order to improve the current poor design skills, production technology, and old facilities. Cooperation between Indonesian and Korean companies needs to be carried out in the fields of technologies such as shipyard construction and operation, ship design and production, construction of uptown, downtown and infrastructure, education, logistics, development of energy resources and offshore plants, installation and dismantling for the long run , and financial management.

Figure 5-3-10 Entry Strategy for Medium-sized Vessel Market in Indonesia



Source: Korea Ministry of Knowledge Economy (2011), Korea-Indonesia Shipbuilding Industry Cooperation Plan

Supportive plans as a policy needs to be prepared to establish clusters for supplying shipbuilding equipment in Surabaya and Batam which will be the eastern and western cores of shipbuilding in Indonesia. Especially, the Batam area needs to actively enter the design and equipment markets of Singapore and Malaysia.

Also policy backed support is also necessary for small shipyards scattered around the country to independently construct small size commercial vessels less than 50,000 DWT, special purpose ships, and also to independently operate ship repair business.

5-4. Textile and Clothing Industry

5-4-1. Development of the Textile and Clothing Industry in Korea

□ Policy & Development of the Textile and Clothing Industry in Korea

① Government's Export Promotion Policy in the 1960s places Korea as an Export Front-Runner

In the late 1910s, Korea's textile and clothing industry took on a modern form of cotton spinning industry with the establishment of the Chosun spinning Co. in 1917 and Kyungsung spinning Co. in 1919. However, most factories were destroyed in the 1950 Korean War. Korea expanded the production facilities of natural textiles such as cotton spinning factories through the foreign aid of US and UN after the Korean War in 1953. Korea achieved full self-sufficiency in the production of natural textiles in 1956.

Korea's textile and clothing industry shifted to an export industry according to the government's newly established export-oriented strategy in the 1960s. The textile and clothing industry with plywood, wigs, and footwear was promoted as an export industry to secure foreign exchange. Labor-intensive industries including textiles and clothing could expand exports through high price competitiveness based on low-wages and abundant labor force.

Table 5-4-1 Korea's Textile and Clothing Exports and Imports in the 1960s

Unit: US$ million, %

	Exports			Imports		
	T/C(a)	Total(b)	a/b	T/C(a)	Total(b)	a/b
1962	7	55	12.7	79	422	18.7
1965	53	175	30.3	87	463	18.8
1968	168	455	37.1	193	1,463	13.2
1971	572	1,068	53.6	284	2,394	11.9
Growth rate	63.1	39.0	-	15.3	21.3	-

Note: 1) T/C is textile & clothing

2) Growth rate is an annual average growth rate between 1962~1971

Table 5-4-2 Korea's Cotton Industry in the 1960s

	Cotton yarns			Cotton fabrics		
	Equipment (plumb)	Production (thousand tons)	Exports (thousand tons)	Equipment (units)	Production (thousand m)	Exports (thousand m)
1962	543,720	53	2(3.8)	9,690	136	12(8.8)
1965	628,928	66	15(22.7)	11,428	184	97(52.7)
1968	759,512	85	15(17.6)	9,478	164	83(50.6)
1970	951,800	99	30(30.3)	10,083	211	155(73.5)
Growth rate	7.2	8.1	40.3	0.5	5.6	37.7

Note: 1) Share of exports by production (%) in ( )

2) Growth rate is an annual average growth rate between 1962~1970

Korea’s textile and clothing exports increased 82 times from USD 7 million in 1962 to USD 572 million in 1971. The share of textile and apparel in the country's overall exports rose more than 4 times from 12.7% in 1962 to 53.6% in 1971.

The government pursued a policy of support for the expansion of exports of light industries which included textile and clothing. It worked towards the devaluation of the won exchange rate from 130 won to 265 won per dollar in 1964 and implements export incentive system s such as preferential financial support for exports, tariff reductions on materials imported for producing export products, tax reductions, accelerated depreciation of fixed assets of major export industries, and immediate solution of export related matters.

The cotton spinning and weaving industries experienced high growth of exports driven by the government's export promotion policy in the 1960s. Cotton yarns exports increased by 15 times from 2 thousand tons in 1962 to 30 thousand tons in 1970. Cotton fabrics exports increased by 13 times from 12 thousand in 1962 to 155 thousand m in 1970.

Background of the rapid growth of the cotton spinning and weaving industries are as follows: the procurement of raw materials from the domestic market facilitated by the government supported cultivation of cotton, high export competitiveness based on low-wages and abundant labor, funding for the expansion of facilities, taxation & financial supports for export, and immediate solution of export related matters.

Korea’s textile and clothing industry was entering an era of chemical fiber in full-scale in the 1960s. Korea Nylon Co. (currently Kolon Co.) and Hanil Nylon Co. (currently Hyosung Co.) constructed nylon plants in 1963 and 1964, respectively. Since polyester was produced in 1968, the Korea's textile and clothing industry entered into its best days. Producing polyester fiber in Korea contributed significantly to improving the export competitiveness of cotton and wool industries. At the time, the most urgent task of enhancing the international competitiveness was to procure stable polyester fibers at low prices. In particular, the drop in the price of polyester fiber from 500 cents in the early 1960s to 100 cents in the early 1970s due to its expanding domestic production contributed to the cost reduction of cotton, wool, fabrics, and garments.

② Heyday through Mass Production in Industrial Complexes in the 1970s

With its high growth rate, the textile and clothing industry led Korea's economic growth in the 1970s. The textile and clothing exports increased by 13 times over the period of 10 years (1970~80), while their annual average was increased by 29.3% from USD 388 million in 1970 to USD 5,099 million in 1980.

In the 1970s, Korea's cotton yarns and fabrics exports increased significantly due to the government's support for procurement of raw materials for export and switch to Japanese importers, etc. The export growth rate of cotton yarns & cotton fabrics recorded an annual average of 20.5% and 13.7% during the period 1971~80, respectively.

Table 5-4-3 Korea's cotton industry in the 1970s

	Cotton yarns(thousand tons)			Cotton fabrics(thousand m)		
	Production	Exports	Export share (%)	Production	Exports	Export share (%)
1971	108.7	52.6	48.4	218.9	169.9	77.6
1975	177.8	113.0	63.6	344.3	325.0	94.4
1980	381.4	281.0	73.7	628.0	540.8	86.1
growth rate	15.0	20.5	-	12.4	13.7	-

Note: Growth rate is an annual average growth rate between 1971~1980

As enterprises located in Daegu started the mass production of polyester fabrics, industrial complexes and production bases were firmly constructed. Polyester was promoted as an export commodity and the production capacity of polyester fiber increased by 12.4 times from 47.5 tons in 1970 to 589 tons per day in 1980.

Thanks to such high growth, Korea was counted as on the "Big Three" world's textile and clothing exporters with Hong Kong and Taiwan. World share of Korea's textile & clothing exports increased by more than 3 times from 2.0% in 1971 to 6.4% in 1981.

③ Foundation for Competitiveness Provided in the Late 1970s

In the 1970s, the industry suffered difficulties with the slowdown of the chemical fiber demand due to the second oil shock, import restrictions of advanced countries through Multi-Fiber Arrangements (MFA), and the vastly catching up developing countries.

In 1979, Korea's government instituted "An Act to Promote Modernization of Textile Industry" to enhance its competitiveness. Korea eliminated facility regulations related to new and extended equipment installation to encourage industry self-competition and strengthened its innovative potential by technology development and manpower training.

④ Structural Upgrade in the 1980s

Korea's textile and clothing industry had renewed investments in the 1980s. Coming into this decade, the decreasing demand for exports caused by weakened price competitiveness raised the need for non-price competitiveness enhancement through technical R&D and design.

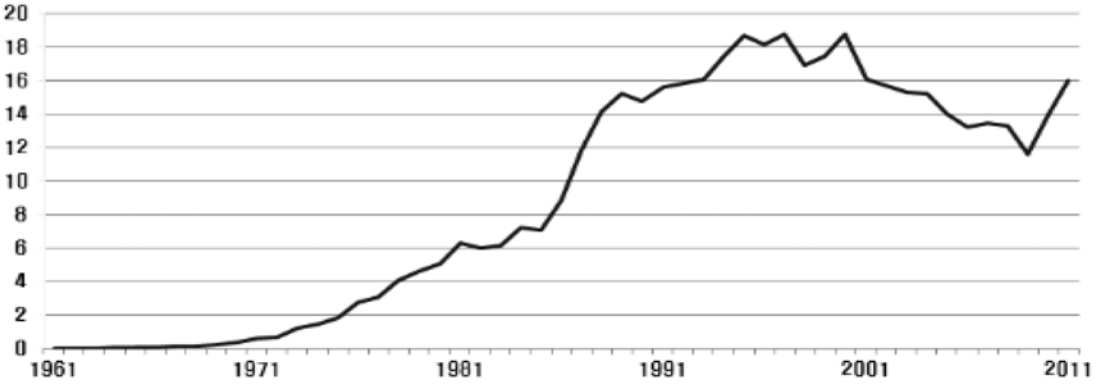
The government attempted to reinforce international competitiveness through investment on dyeing & finishing, fashion and design sectors. Korea constructed the dyeing & finishing Complex in Daegu in 1981 and Banwol in 1987. In 1986, the government funded further development of new technology, materials, and educational equipment for fashion and design.Spurred by such governmental policies, the textile and clothing export exceeded USD 10 billion for the first time in 1987.

⑤ Caught up by Late-comers in the 1990s

As production costs of Korea's textile and clothing industry rose due to wage hikes and excessive labor disputes in the late 1980s, the industry moved production facilities to developing countries such as China, Indonesia and Vietnam with inexpensive and abundant labor.

Figure 5-4-1 Korea's Foreign Direct Investment

Figure 5-4-2 Korea's Textile and Clothing Exports



In 2000s, the slowdown of Korea's textile and clothing exports was caused by the expansion of direct foreign investment and the encroachment of Asian developing countries. The textile and clothing exports decreased from USD 18.8 billion in 2000 and to USD 15.9 billion in 2011.

⑥ Increasing Competitiveness in the late 2000s

In the late 2000s, Korea's textile and clothing industry improved its competitiveness through the upgrading of the industry structure and the pioneering efforts of companies in the world market. In order to escape the price competition with China's products, Korea's textile and clothing products became diversified and aimed for higher value goods by research and development

Table 5-4-4 Korea's Textile and Clothing Production

Unit: Korea Won million, %

	2000	2006	2008	2010	growth rate
Chemical fibers	4,631	3,464	3,959	4,446	6.4
Yarns	4,897	2,000	1,913	2,610	6.9
Fabrics	9,455	7,483	7,842	9,019	4.8
Dyeing & Finishing	4,966	3,575	3,802	4,263	4.5
Clothing	9,782	12,890	14,602	18,378	9.3
Other	2,963	3,040	3,378	3,773	5.5
Total	36,694	32,451	35,495	42,489	7.0

Source: Korea National Statistical Office

Note: Growth rate is an annual average rate between 2006 and 2010

Korea's textile and clothing production started to boom in 2006 with the speedy growth of high-function materials, sports clothing, and industrial textile products. The textile and clothing production increased from 32.5 trillion Won in 2006 to 35.5 trillion Won in 2008 and more to 42.5 trillion Won in 2010. In examining the production growth rate by field in the period 2006 to 2010, special fabrics, natural fiber yarns and clothing increased significantly by an annual average of 14.2%, 9.8% and 9.3%, respectively, but silk fabrics, wool fabrics, and synthetic fiber spun yarns decreased by 11.0%, 7.6% and 7.5%, respectively.

Korea's textile and clothing exports started to increase in 2010 due to the diversification of export markets and the promotion of value-added technical fibers. The textile and clothing exports increased from USD 11.6 billion in 2009 to USD 15.9 billion in 2011. Fabrics accounted for 60.7% of the industry's total exports in 2011. In examining the export share by

field, knitted fabrics, synthetic filament fabrics, clothing and synthetic staple fibers recorded a high percentage of 26.6%, 14.0%, 10.5% and 9.0% in 2011, and knitted fabrics and synthetic staple fibers surged rapidly from 13.4% and 4.6% in 2000 to 26.6% and 9.0% in 2011, respectively.

Table 5-4-5 Korea's Textile and Clothing Exports

Unit : US$ million, %

	Exports					Export Share			
	2000	2005	2009	2011	Growth rate	2000	2005	2009	2011
Synthetic staple fibers	859	922	793	1,431	34.3	4.6	6.6	6.8	9.0
Yarns	1,535	1,421	1,175	1,794	23.6	8.2	10.2	10.1	11.2
Fabrics	10,263	8,038	7,119	9,684	16.6	54.6	57.6	61.2	60.7
Clothing	4,652	2,314	1,241	1,666	15.9	24.8	16.6	10.7	10.5
Other	1,475	1,251	1,306	1,368	2.3	7.9	9.0	11.2	8.6
Total	18,783	13,946	11,634	15,943	17.1	100	100	100	100

Source: The Korea International Trade Association (KITA)

Note: Growth rate is an annual average rate between 2009 and 2011

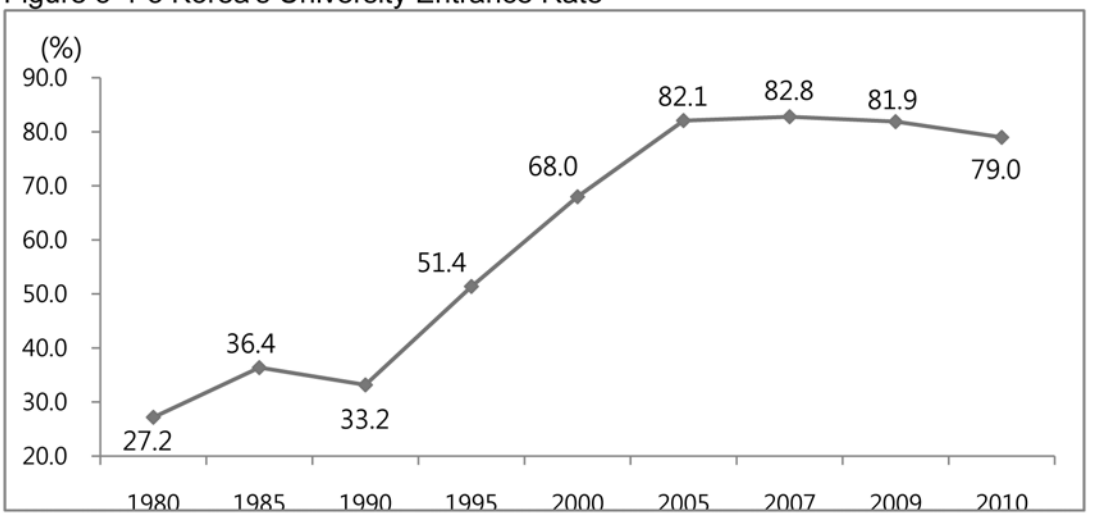
⑦ Success Factors and Evaluation

Korea's textile and clothing industry achieved remarkably high growth through government-led export policy since the 1960s. The textile and clothing exports increased from USD 4.0 million in 1960 to USD 11.84 billion in 1987 and to USD 15.94 billion in 2011.

The industrial structure of Korea’s textile and clothing was upgraded similar to those of advanced countries by promoting promising industries by era. That is, clothing and cotton industries (spinning & weaving) in the 1960~70s, chemical industries (fibers, spinning & weaving) in the 1970~80s, dyeing & finishing industries in the 1980~90s, and advanced textile materials, technical fibers, high fashion clothing in the 1990~2000s.

The effective growth of Korea’s textile and clothing industry was attributable to high level of education and vigorous entrepreneurship. Korea's university entrance rate recorded high level of about 80%.

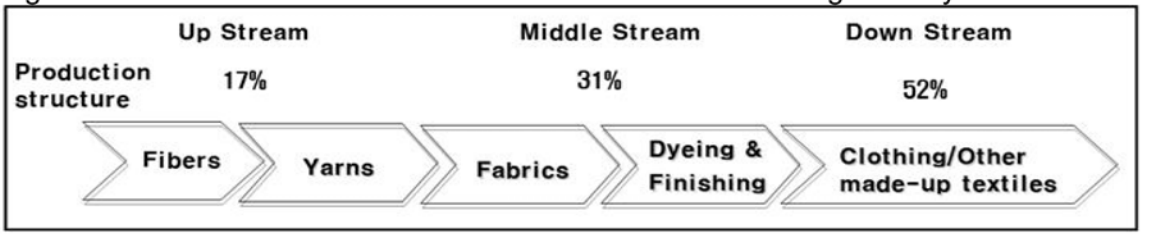
Figure 5-4-3 Korea's University Entrance Rate



Source: Korea National Statistical Office

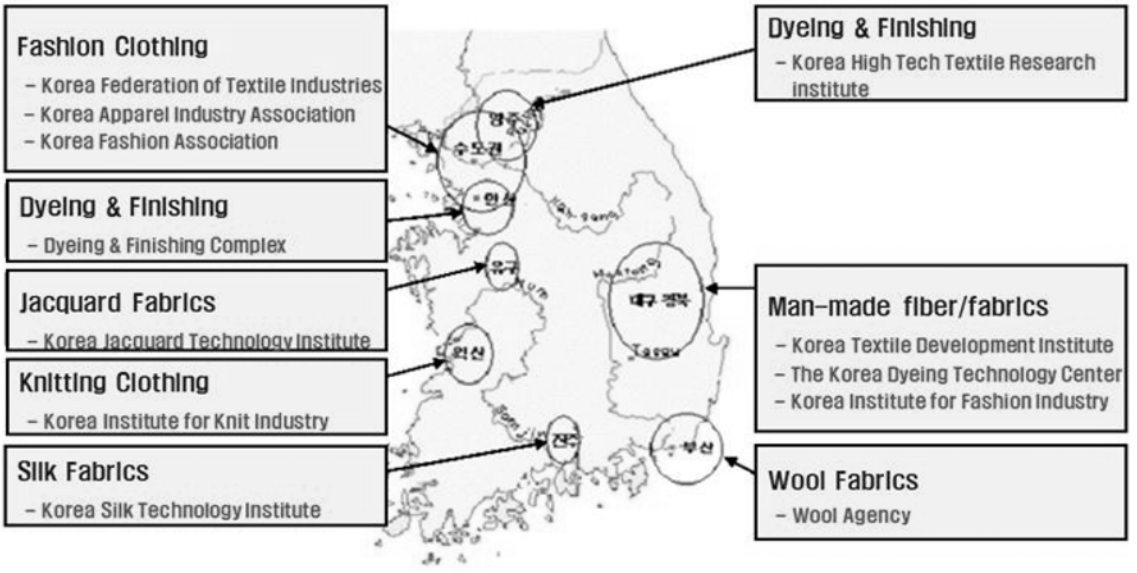
Another factor behind the effective growth was the structure of the industrial production processes from upstream, middle-stream to downstream. Upstream pertains to fibers and spinning, middle-stream pertains to weaving, knitting and dyeing and finishing and downstream pertains to clothing and textile goods.

Figure 5-4-4 Production Structure of Korea's Textile and Clothing Industry



Another factor behind the high growth rate was the reinforcement of productions bases through the establishment of industrial complexes for the textile and clothing industry including a fabric complex and dyeing and finishing complex in Daegu, a chemical fiber complex at Gumi, and a dyeing and finishing complex in Anshan, etc. In particular, Korea's textile and clothing industry established regional specialized innovation clusters including regional specialized production and research-bases.

Figure 5-4-5 Clusters of Korea's textile and clothing industry by region



Another factor of the high growth was that the industry has strengthened innovative potential such as design & technology development and manpower training.

5-4-2. Development Direction of Textile and Clothing Industry in Indonesia

□ SWOT Analysis of Textile and Clothing Industry in Indonesia

① Strengths

Indonesia is endowed with rich and diversified natural resources, especially oil and gas reserves and minerals including bauxite, copper, nickel, tin, gold and silver.

Indonesia has an abundant and cheap labor force of 114 million people of a 245 million population. In particular, over 50% of the population is under 29 years of age.

Labor cost is low compared with major competitors such as China, Malaysia and Thailand. In 2011, the average labor cost in Indonesia was USD 1.08 per hour which is 40~50% lower than in some competing countries such as China, Malaysia and Thailand in the textile sector. In the clothing sector it was much lower at a USD 0.44 per hour in 2010.

The government provides funds for companies to invest in modern manufacturing equipment in order to boost productivity and increase international competitiveness.

The industry is vertically integrated with fibers, yarn, fabric, to clothing as a one stop service.

② **Weaknesses**

Indonesia's most serious weakness is the poor state of much of the country's infrastructure. The business environment is becoming more and more constrained by the lack of infrastructure development.

Many of Indonesia's small to medium-sized textile and clothing companies operate with outdated manufacturing equipment.

Indonesia's electricity cost and port fees are high compared with other Asian countries, as well as transport costs. The cost of electricity is USD 0.8 per kwh compared with USD 0.3 in Bangladesh, USD 0.6 in Korea, USD 0.66 in Pakistan and USD 0.7 in Vietnam.

Middle-stream industry which pertains to the fabrics sector and the dyeing and finishing sector is very vulnerable compared to the other streams such as the clothing sector and the synthetic fiber sector. As a result, the fabrics sector documented a trade deficit of USD 2.7 billion in 2011.

Indonesia is dependent on imports for raw cotton and textile & sewing machines. Textile and sewing machines recorded a trade deficit of USD 954 million in 2011. Indonesia is dependent on imports for around 80% of its raw cotton requirements.

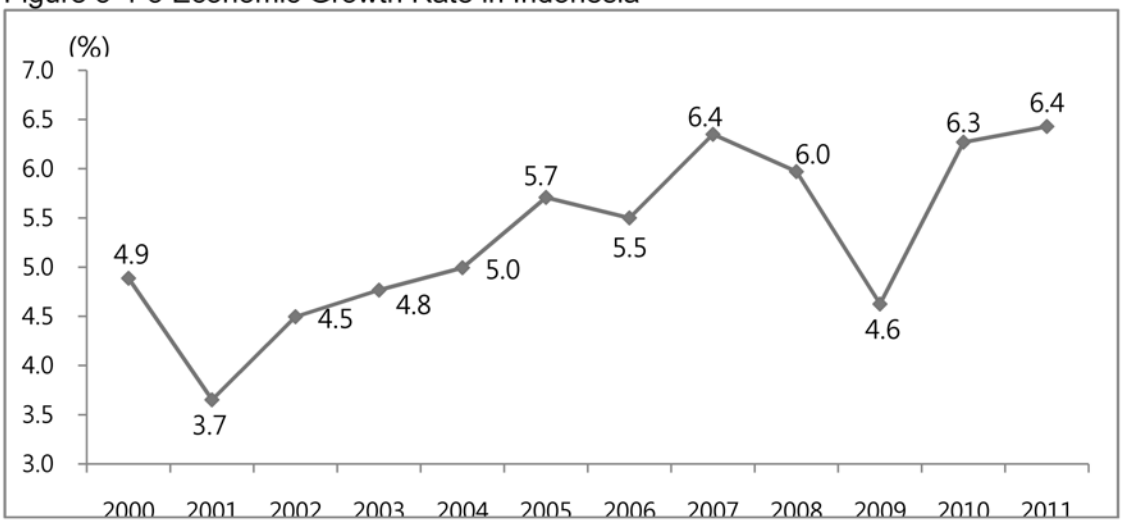
Clothing exports are over-dependent on the USA and the EU.

③ **Opportunities**

With rising economic activity and the corresponding growth in personal disposable incomes, there is bright prospect for a steady and progressive increase in domestic demand.

Moreover, Indonesia's textile and clothing industry is enjoying the benefits of a huge and expanding domestic market. The country has a large and growing population of 242 million people which is the world's fourth largest after China, India and the USA according to 2011 data.

Figure 5-4-5 Economic Growth Rate in Indonesia



The current population has a bias towards the young. However in the future, fashion clothing will become ever more important, especially as this age group becomes further exposed to global trends through the Internet and social media.

Indonesia's government is keen to promote policies aimed at developing existing strengths as well as enhancing the textile and clothing sector's interests and prosperity. Under the Machines Restructuring Program for textile and leather small to medium enterprises, the government provides funds for companies to invest in modern manufacturing equipment in order to boost productivity and increase international competitiveness. So far, however, it is estimated that only around 6% of the industry's outdated machinery has been replaced under this program.

④ Threats

Rise of labor costs and labor disputes will interfere with business activities. Wage rates have been rising in recent years. In 2010, the average labor cost in the textile sector increased by 19.7% compared to the previous year. Also, the minimum wage in Jakarta increased by an annual average of 10.4% during the period of 2005~2011.

Table 5-4-6 Jakarta's minimum wage trends

Unit: One thousand Indonesian Rupiah

	2005	2006	2007	2008	2009	2010	2011
Minimum wage	711.8	819.1	900.6	972.6	1,069.9	1,118.0	1,290.0
Growth rate	-	15.1	10.0	8.0	10.0	4.5	15.4

Source: Jakarta Post

On the economic front, there are fears that Western countries, especially those in Europe, could slip back into recession.

Indonesia faces the challenge of fierce competition from other developing countries including Vietnam, India, Bangladesh, Cambodia and Myanmar, which has a lower average labor cost than that of Indonesia. In 2011, labor costs in Indonesia are 80% higher than Vietnam in the textile sector.

□ The Basic Direction

① Establishment of a Balanced Industrial Structure

Through the promotion of the dyeing and finishing industry and fabrics industry, Indonesia's textile and clothing industry should establish a balanced industrial structure composed of fibers, yarns, fabrics, dying & finishing, clothing and other made-up textiles.

In particular, through the promotion of the textile and sewing machine and replacement of old facilities, the textile and clothing industry will need to increase the efficiency of production.

② Solidifying the Production Foundation

Indonesia's textile and clothing industry will need to strengthen the manufacturing base through the development of programs aimed at attracting FDI and the construction of industrial complexes.

Development challenges	Development strategies	Development Goals
Establishment of a balanced industrial structure	- The promotion of the dyeing & finishing industry and fabrics industry	The establishment of a balanced industrial structure
	- The promotion of the textile & sewing machine - Replacement of old facilities	The enhancement of production efficiency
Strengthening of production-based	- Program development attracting FDI - The construction of an industrial complex.	The strengthening of the manufacturing-based
	- The establishment of the quality inspection system.	The improvement of product reliability
Establishment of design and R&D-based	-Technology development - Fashion design development - Manpower training	The reinforcement of the international competitiveness
Strengthening of marketing capability	- The expansion of the advertising & exhibiting capacity - The attraction of overseas buyers - The diversification of export items and export markets	Pioneering the global market

The industry should improve the reliability of the product through the establishment of the quality inspection system.

③ Establishment of Design and R&D basis

Indonesia's textile and clothing industry should strengthen innovative potential such as technology development, fashion design development and manpower training in response to the increasing demand and to strengthen the international competitiveness.

④ Strengthening Marketing Capability

Indonesia's textile and clothing industry should strengthen marketing ability through the expansion of advertisement & exhibition, the attraction of overseas buyers and the diversification of export items and export markets.

□ Detailed Plans

① Establishment of a Balanced Industrial Structure

To respond to intensifying competition in the global market, Indonesia should promote the dyeing and finishing industry as the core field of the textile & apparel industry and enter the market of higher value-added products. The dyeing and finishing process is a very important process in ensuring sophisticated end products by giving the color, function and sensibility to yarns, fabrics, clothing and textile products. In particular, differentiated fabrics can increase its added-value 3 to 10 times through the process of dyeing and finishing.

Indonesia should expand the production facilities of fabrics such as knitted fabrics, cotton fabrics and synthetic filament fabrics for its import substitution as well as export expansion. As Indonesia's textile and clothing industry is expanding their imports of fabrics used in clothing production from foreign countries is also increasing. Their production capacity expansion is required for import substitution. In particular, if clothing enterprises procure fabrics from the domestic market by fostering the fabrics industry, the competitiveness of the clothing industry will be further strengthened. As the demand for industrial textiles is expected to increase with the development of the automotive industry and the construction industry, Indonesia should strengthen the production base including non-woven fabrics and tapaulin.

Indonesia should promote the textile and sewing machine industry for import substitution. For the development of the textile & sewing machine industry, the standardization of the components of textile & sewing machines and the specialization of related parts is necessary.

Indonesia's textile and clothing industry should invest in the replacement of old facilities in order to improve the efficiency in production.

② Strengthening of Production Foundation

It is necessary for Indonesia's textile and clothing industry to attract foreign investment in the field of dyeing & finishing, knitted fabrics, textile & sewing machines, and clothing and advanced textile materials. Their industry has to pursue a policy of aggressive foreign investment incentives including land rent exemptions and tax reduction.

Indonesia should build an industrial complex for the fabrics, dying, and finishing industry for further attraction of foreign investment. In particular, industrial complex for the dying and finishing industry should have its own energy procurement system and wastewater treatment facilities.

The textile and clothing industry should strengthen its quality inspection system so as to enhance the reliability as well as the quality of products. In particular, it is necessary to establish a system of quality inspection so as to meet the level of quality that the buyer expects before the shipment of products.

③ Establishment of Design and R&D Bases

Indonesia should establish a National Institute of Textile Technology for the research & development of textile technology and the fostering of technical manpower. The textile and clothing industry should pursue inter-industry joint R&D and collaborative research among industry, academy, institute and government.

The textile and clothing industry will need to build an education system for industrial professionals and skilled workers with the promotion of Human Resource Training Project. Indonesia should conduct education on specialized technology of individual items to workers. In particular, Indonesia will need to transfer the technology to the textile and clothing manufacturer by recruiting retired technicians from developed countries.

Its industry should promote the improvement of clothing quality through the expansion of fashion design development capabilities. The industry should also actively scout new designers through holding various Fashion Design Contests. Fashion design development, design manpower, and exhibit space expansion should be pursued through the construction of a Fashion Design Center.

Developed countries are now trying to link trade and environmental issues due aggravating global environmental situation. The dying & finishing industry should promote environment-friendly and energy-saving dyes and finishing technology development in order to continue increasing exports. .

④ Strengthening of Marketing Capability

In order to increase the exports of its textile & clothing products continuously, Indonesia's textile and clothing industry has to magnify advertising of their products by participating in international exhibitions.

Also, Indonesia's textile and clothing industry has to attract overseas buyers by holding International Textile Exhibition in their domestic market. Its industry should promote the diversification of export items and export markets

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VI. Korea-Indonesia Industrial Cooperation

Geun-Ju Jeong[22]

This final chapter is going to focus on the issues of bilateral cooperation between Korea and Indonesia. First, a brief history of bilateral cooperation is followed by the statistical data in Trade and Investment. Then, major cooperation issues and cases in the public and private sectors are to be presented. The concluding part will discuss how to expand and deepen the bilateral cooperation.

6-1. Korea and Indonesia: Strategic Partnership

Korea and Indonesia established diplomatic relations in September 1973. Korea's President Chun visited Indonesia for the first time as the head of state in 1981, and as a reply Indonesia's President Sukarno visited Korea in 1982. From this point on, both countries have maintained active relationship. The annals of major agreements since the 1970s are briefly shown in <Table 6-1-1>. An important turning point in the bilateral relationship was made in 2006, when Korea's President Roh visited Indonesia. As mentioned in Chapter 1, in this year, they entered into "Strategic Partnership" through the summit meeting, which has helped expanding their relations in full scale from all areas including policies, economy, business, and culture, etc. Then, In 2007, Korea signed FTA with ASEAN, which has contributed to the rapid increase of bilateral trade between Korea and Indonesia. Recently, both countries started negotiation on the Comprehensive Economic Partnership Agreement (CEPA) and are running the Joint Cooperation Task Force and Joint local office in Jakarta, of which the mission is to explore practical cooperation items in various fields across the public and private sectors.

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Table 6-1-1. Major Agreements between Korea and Indonesia

Agreements	Signed	Effective
Agreement regarding Economic and Technical Cooperation and Trade Promotion	1971.4	1971.8
Agreement for air services	1989.9	1989.9
Investment promotion and protection agreement	1991.2	1994.3
The agreement concerning a loan from the Economic Development Cooperation Fund	1997.11	1997.11
Agreement on Cooperation in the Fields of Energy and Mineral Resources	2002.3	
Korea-ASEAN FTA in - Goods - Services - Investment	 - 2006. 8 - 2007.11 - 2009. 6	 - 2007.6 - 2009.5 - 2009.9
Korea-Indonesia CEPA	2012.3, Start negotiation	

6-1-1. Potential for Bilateral Cooperation

Korea and Indonesia have complementary economic structures. Korea is the third largest economic superpower in Asia. The country currently has the 12th highest GDP (PPP) and the 6th largest foreign exchange reserves in the world. Also, Korea has strong industrial production bases. However, Korea's small land area is poor in natural resources resulting in 96% of energy imports. Furthermore, the labor cost is very expensive. On the other hand, Indonesia has vast land, abundant natural resources and labor forces, which imply excellent conditions and potential for successful economic development. In addition, Indonesian government has been actively pursuing industrialization programs recently to fully realize and maximize such potentials. Therefore, the complementary economic structures between Korea and Indonesia are perfect settings for bilateral cooperation.

Korea has been recently hosting programs of sharing its economic development experience and know-how with developing countries to support their will to realize successful industrialization. This research is conducted as part of such programs.

Figure 6-1-1. Economic Structures and Endowments of Korea and Indonesia

	Korea	Indonesia
Land	Small	Vast (19 times larger than Korea)
Natural Resources	Import-dependent	Abundant
Labor	Highly paid and aging	Growing labor force
Market	Mature	High potential for growth
Industrial Structure	Strong manufacturing basis	Dependent on natural resources
Development Experience	Compressed growth	Inconsistent growth

6-1-2. Working Group Meetings for Master Plan

The bilateral cooperation for the implementation of the Master Plan, or MP3EI, has started from 2011. In February 2011, A Special Envoy from Indonesia headed by the Minister for Coordinating Ministry of Economic Affairs visited Korea. At the time, as described in Chapter 1, the Indonesian government was preparing a draft MP3EI and the envoy discussed Korea's participation in the elaboration and implementation of the Master Plan. As a result, an apparatus to focus on the bilateral cooperation on MP3EI was established as the Working Level Task Force, which was named to differentiate it with the high-level Joint Level Task Force that held two previous meetings in 2007 and 2010. Since then, this Working Level TF is functioning as the focal point of bilateral cooperation in the areas of economy and business. On the while, a series of Summit and High Level meetings have been held through the regional arms of APEC and ASEAN+3 as well as bilateral windows.

The first joint meeting of the Working Level Task Force was held in Bali on 18-19 May 2011. This TF was organized along the arms of 7 Working Groups, each focusing on Trade and Investment, Forestry and Agriculture, Energy and Mineral Resources, Infrastructure and Construction, Defense Industry, Industry and Policy Cooperation, and Development Financing. The second joint meeting of the TF was held on 24-25 October 2011 in Seoul. In this meeting, the two countries agreed to add the Working Group on Environment, and a new cooperation agenda of CNG vehicle and machine tool industry was included. After the

meeting, on 17 November 2011, both countries signed a Terms of Reference (TOR) on the establishment of the Joint Secretariat for Economic Cooperation, which became open in Jakarta in February 2012.

And in October 2012, the third TF meeting was held in Jeju Island, Korea. In this meeting both sides checked the ongoing issues and discussed how to lead to practical results with a view to advancing and expanding bilateral economic cooperation. Especially in the Working Group on industrial cooperation, the investment project of Daewoo Shipbuilding Marine Engineering and CNG cooperation came up as a new cooperation agenda

6-2. Industrial Development Policy Issues

Cooperation in the industrial development policies to assist the elaboration and implementation of the MP3EI has been one of the top agenda in the bilateral meetings so far, which led to the initiation of this research project. In this part, the industrial development plans and some current data on the manufacturing sector of Indonesia are to be examined. As the previous chapters have already examined the issues in detail, this part is a brief complementation to proceed to the issue of bilateral cooperation. .

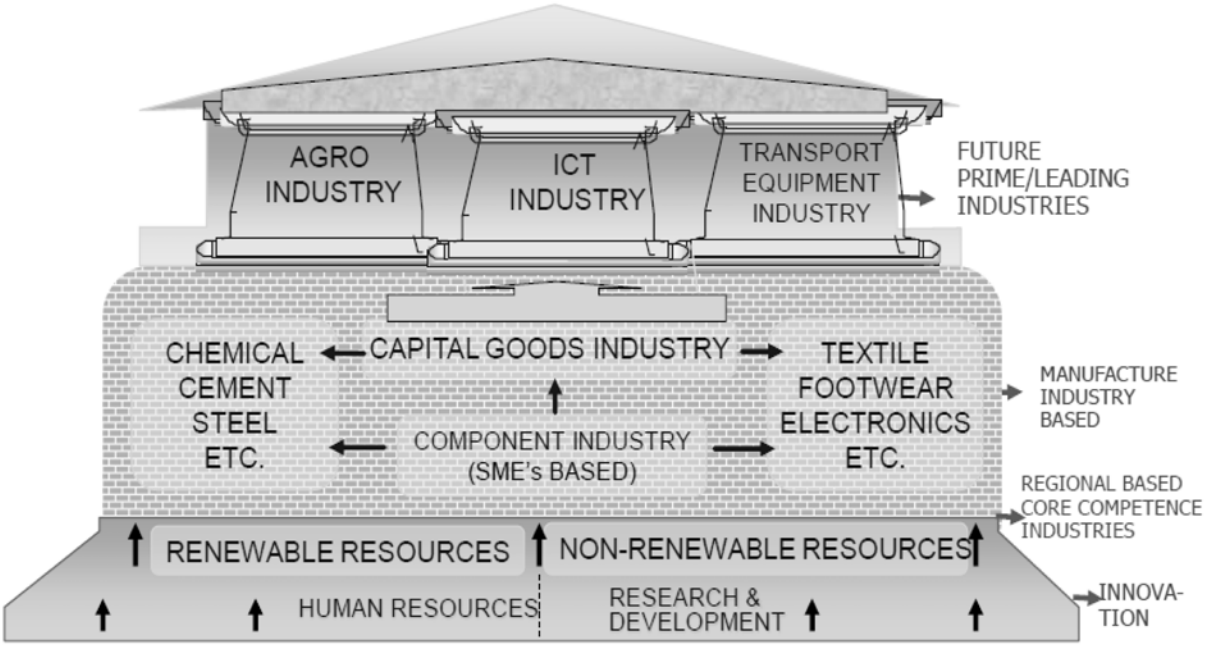
6-2-1. Indonesia's Industrial Development Plan

As mentioned in Chapter 1, the Indonesian government has been implementing the Long-term and Medium-term development plans before it announced the MP3EI in May 2011. Law No. 25/2004 regarding the National Development Planning System mandated the integration of Indonesia's long, medium-term and annual development plans (Strategic Asia, 2012: 19). The MP3EI was designed not to replace but to complement the existing plans, and as such, it does not contain the part focusing on industry-specific development plans. .

The National Long-term Development Plan (RPJPN) 2005-2025 is a plan that constitutes the basis for development programs over the 20 years. Under this plan, the government aims to build a manufacturing-based industrial structure that will make Indonesia a strong industrial nation by 2025. The plan adopts the cluster approach to achieve collective competitiveness of industries. The objectives are as follows: (i) "to achieve sustainable competitiveness, supported by strong basis of science and technology", (ii) "to build cooperation networks

between small and large industries", and (iii) "Well-distributed industries in all parts of Indonesia based on the potential and support capabilities of each region".

Figure 6-2-1. Future Industrial Structure (Long-term Development Plan by 2025)



Source: Ministry of Industry

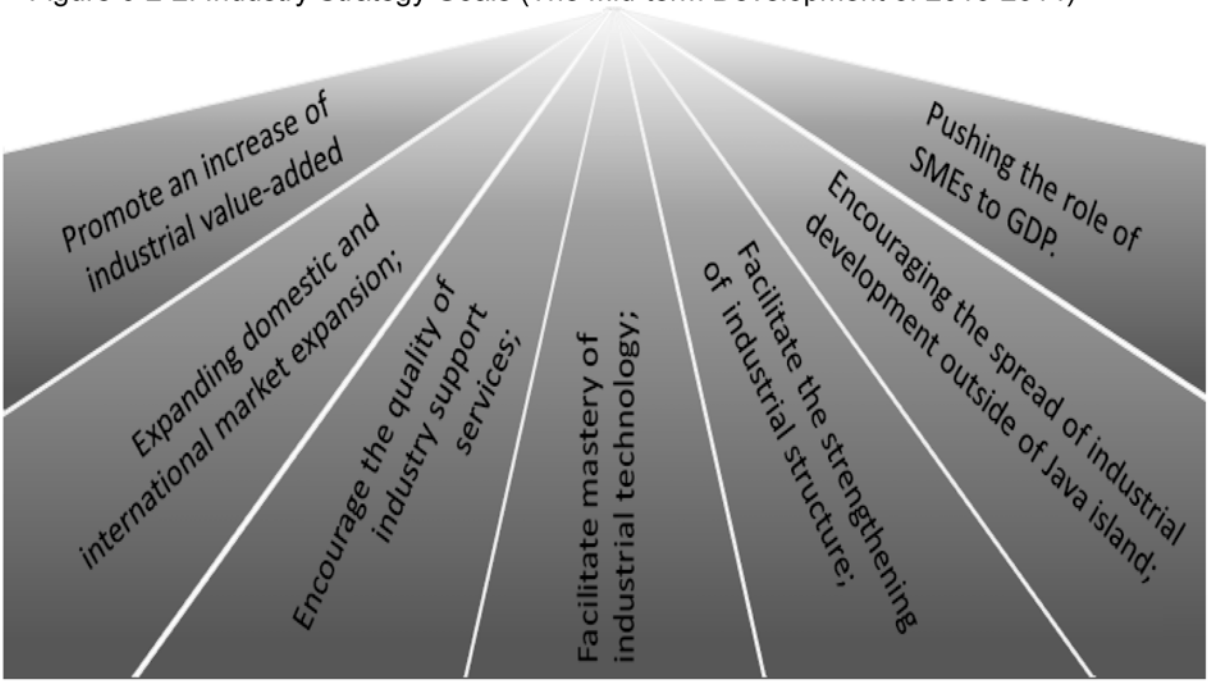
The prime industries include "Agro industry", "ICT industry" and "Transport equipment industry". Labor and technology are key elements to support these industries. These future industries are planned to be based on strong manufacturing basis. It is assumed that R&D capability and skilled human resources are important for the long-term development through both process and product innovation. The ideas of main scheme for industrial development are illustrated in <Figure 6-2-1>.

The National Medium-term Development Plan (RPJMN) 2010 – 2014 is the second phase medium-term plan complementing the long-term development plan. The first medium-term development plan (2004-2009) produced encouraging results, but still there was much room for development. The vision of the second mid-term plan is "to strengthen competitiveness of sustainable manufacturing industry and build a pillar of future prospective industry by 2014". To implement this vision, the Indonesian government has set 7 goals of industrial strategy.

Selected industries are planned to be intensively promoted to increase capacity, strengthen industrial structure and improve competitiveness.

The goals of industrial strategy are as follows: ① to enlarge industrial value-added ② to expand domestic and international market ③ to encourage high-quality of industry support services ④ to facilitate mastery of industrial technology ⑤ to strengthen the industrial structure ⑥ to spread the industrial development outside of java island, and ⑦ to push the role of SMEs to GDP. Through this plan, the Indonesian government wants to strengthen industrial competitiveness, improve investment climate, expand exports and promote economic growth together.

Figure 6-2-2. Industry Strategy Goals (The Mid-term Development of 2010-2014)



Source: Ministry of Industry

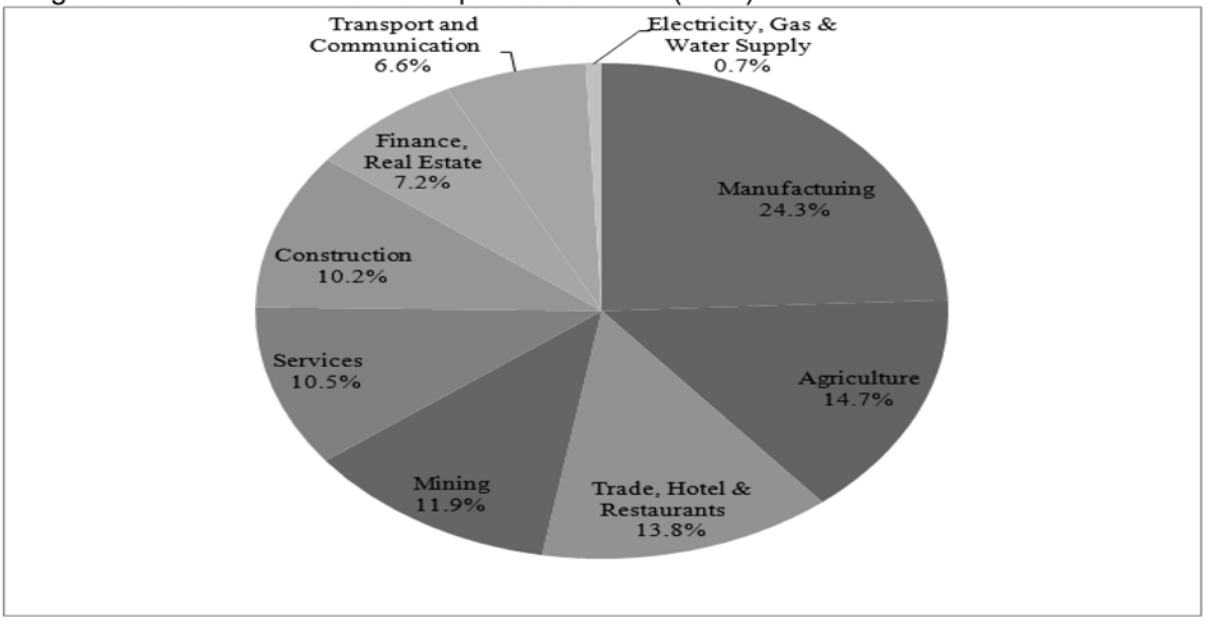
6-2-2. Indonesia's Industrial Structure

The largest contributor to the real GDP of Indonesia was manufacturing (24.3%) in 2011. Its contribution to GDP increased from the previous year but the level of job creation was still low. The second largest sector, agriculture, accounted for 14.7% of GDP but employed

almost 40% of the total labor force. Trade, hotel & restaurants (13.8%), mining (11.9%) and services (10.5%) also accounted for significant portions of the total GDP.

In general, Indonesia's major manufacturing industries such as food, beverage, textile and automotive industries heavily rely on its domestic market. To understand the Indonesia's industrial structure, it is important to consider both production (supply) side and consumption (demand) side.

Figure 6-2-3 Sector Composition of GDP (2011)



Source: Badan Pusat Statistik Indonesia.(BPS) (2011)

On the supply side, 27.7% of Indonesian manufacturing was composed of food and beverage, followed by chemical (14.7%), textile (11%) in 2011. During the period of 2001-2011, the proportion of textile, non-metal products and machinery in manufacturing sector had decreased. The country's share of consumption goods is still bigger than that of capital goods. The average growth rate of automotive industry from 2001 to 2011 was 7%. It was mainly derived from motor vehicle assembly and motorcycle manufacturing.

On the demand side, food and beverage industries also recorded the largest share (27.7%), followed by the chemical industry (15.6%) in 2011. The gap between the food industry and the chemical industry on the consumption side was much smaller than that on the production side in 2011.

Table 6-2-1 Contribution of Industrial Sector (% of Total Production)

	2001	2005	2009	2010	2011
Food and beverages	22.6	24.2	28.3	28.1	27.7
Textile(incl. apparel, leather)	14.4	14.0	11.3	10.9	11.0
Paper and printing	7.1	7.6	7.4	7.1	7.1
Refined petroleum	0.0	0.2	0.2	0.1	0.2
Chemical products	11.9	10.1	13.0	13.7	14.7
Rubber products	4.6	9.0	6.6	6.4	6.3
Non-metal mineral products	4.5	3.4	2.5	2.4	2.3
Metal products	7.9	9.6	6.9	7.4	8.0
Machinery	5.1	1.5	1.8	1.7	1.7
Electronics & ICT	6.1	5.3	6.7	6.4	6.0
Automotive	3.6	5.8	6.6	7.2	7.2
Transport equipment	4.0	3.3	4.0	4.2	4.2
Others	7.9	6.0	4.6	4.2	3.7
Total manufacturing	100.0	100.0	100.0	100.0	100.0

Source: Global Insight (2012)

Similar to the production side, the share of non-metal mineral industry on the consumption side steadily decreased from 2001 to 2011. As industrialization has been progressed, the demand of automotive products including transport equipment has increased, and its industry had the third highest proportion. While the share of refined petroleum in production was very low (0.2%), the consumption of that products was very high (8.3%) in 2011. Indonesia is one of the southeast oil producers, but the corresponding industry is not as robust as it should be. This means that Indonesia needs the improvement in petroleum refining system to meet the increasing demand of the domestic and overseas market.

Table 6-2-2. Contribution of Industrial Sectors (% of Total Consumption)

	2001	2005	2009	2010	2011
Food and beverages	17.7	17.4	18.8	17.9	17.3
Textile(incl. apparel, leather)	6.7	7.6	8.1	7.6	7.7
Paper and printing	4.3	5.6	5.7	5.2	5.0
Refined petroleum	2.9	9.1	5.4	6.7	8.3
Chemical products	15.7	12.9	14.8	15.0	15.6
Rubber products	4.3	8.3	5.8	5.5	5.3
Non-metal mineral products	5.7	3.0	2.2	2.1	2.0
Metal products	8.7	11.7	7.6	8.2	8.7
Machinery	9.8	6.1	6.0	6.5	6.4
Electronics & ICT	6.2	4.4	6.5	6.9	6.6
Automotive	5.6	7.8	7.3	8.3	8.1
Transport equipment	5.9	3.8	5.7	5.4	5.0
Others	6.8	2.3	6.1	4.8	4.0
Total manufacturing	100.0	100.0	100.0	100.0	100.0

Source: Global Insight (2012)

6-3. Trade and Investment

Korea is a major trading and investment partner for Indonesia, and the bilateral trade and investment have rapidly increased in recent years. This part examines current status of Indonesia's trade and Foreign Direct Investment, and then the status of bilateral cooperation between Korean and Indonesia.

6-3-1. Indonesia’s Trade with the World

Thanks to the rise of international commodity prices and the buoyant domestic economy, Indonesia's trade has shown a rapid expansion in both exports and imports since the early 2000s. During the period of 2001-11, Indonesia's overall trade volume has grown annually

by 15.9% from $87 billion to $381 billion dollars, a growth of 4.4 times. Exports have grown by 13.7% from $56 billion to $203 billion, but imports have grown faster by 19.1% from $31 billion to $177 billion. Due to this situation, trade balance has fluctuated annually, though it has remained in the surplus (Table 6-3-1). However, in 2012, Indonesia has recorded a shock trade deficit due to the global recession and the slowdown of exports and the still fast growth of imports. As this trend is expected to continue for a while, managing trade balance is being raised as a new serious policy concern.[23]

Table 6-3-1. Indonesia's Trade with the World and Korea (milion $)

		2001	2005	2009	2010	2011	Average increase
World	Exports	56,317	85,660	116,510	157,779	203,497	13.7%
	Imports	30,962	57,701	96,829	135,663	177,436	19.1%
	Balance	25,355	27,959	19,681	22,116	26,061	
	Total	87,279	143,361	213,339	293,442	380,933	15.9%
Korea	Exports	3,772	7,086	8,145	12,575	16,389	15.8%
	(ranking)	5	5	6	6		
	Imports	2,209	2,869	4,742	7,703	13,000	19.4%
	(ranking)	5	7	7	7		
	Balance	1,563	4,217	3,403	4,872	3,389	
	Total	5,981	9,955	12,887	20,278	29,389	17.3%

Source: UN Comtrade data

Indonesia is a resource-rich country which exports a variety of natural resources. Major export items of Indonesia are natural gas & oil, animal and vegetable oils such as palm oil. natural rubber, coal, copper ore, coffee, wood, etc. Manufacturing exports have increased fast in such industries as electronics, textiles and garments, footwear, pulps and papers, etc. but the majority of exports are still dominated by primary goods to the weight of more than 60% of total exports as of 2011 (Table 6-3-1).

[23] According to the recent statistics, the exports of Indonesia in 2012 decreased by 6.6% to $190 billion, while imports increased by 8.0% to $191.
http://www.tradingeconomics.com/indonesia/balance-of-trade

Thanks to the exports of abundant natural resources, Indonesia has traditionally recorded trade surpluses since the 1960s. The reversal of this trend by shock trade deficits in the very recent months stirs up serious trade policy concern, as mentioned previously. Major export markets of Indonesia are China, Japan, USA, Singapore, Malaysia, and Korea.

Table 6-3-2 Indonesia's Exports by Commodity Group, 2011

(Unit: $ milion)

HS	Commodity Group	Value	Weight
27	Natural gas & crude oil	68,921	33.9%
15	Animal and vegetable oils and fats	25,486	12.5%
85	Electrical, electronic equipment	24,275	11.9%
40	Rubber	21,769	10.7%
84	Machinery, heating and cooling	20,704	10.2%
26	Mineral Ores	16,447	8.1%
87	Transport equipment excluding railway items	12,757	6.3%
48	Paper and pulp	10,115	5.0%
38	Chemical products	2,224	1.1%
62	Apparel	808	0.4%
	Total	203,497	100.0%

Source: UN Comtrade data

Indonesia's imports items are mostly manufacturing goods. The largest commodity group is refined petroleum and its imports have rapidly increased in recent years responding to the expanding domestic consumption. Though Indonesia is a resource-rich country exporting natural gas and crude oil, the fact that Indonesia is depending heavily on imports for domestic energy consumption reflects the shortage of refining facilities and processing industries. Imports of durable consumer goods such as refrigerators, air-conditioner, automobiles, and electronic goods have also grown fast in recent years. Major imports partners are almost similar to export partners.

Table 6-3-3 Indonesia's Imports by Commodity Group, 2011 ($milion)

HS	Commodity Group	Value	Weight
27	Refined petroleum	40,840	23.0%
84	Machinery, heating and cooling	24,729	13.9%
85	Electronics goods	18,245	10.3%
72	Iron and steel	8,581	4.8%
87	Transport equipment excluding railway items	7,603	4.3%
39	Plastics	6,678	3.8%
29	Organic chemicals	6,635	3.7%
10	Cereals	4,753	2.7%
73	Iron and steel products	3,573	2.0%
88	Aircrafts and parts	3,421	1.9%
	Total	177,436	100.0%

Source: UN Comtrade data

6-3-2. Indonesia's Trade with Korea

Korea is an important trading partner of Indonesia, and Indonesia has recorded consistent trade surplus with Korea. During the period of 2001-11, the total trade volume increased by 17.3% annually. In 2011, Korea was the 6th largest export market and the 7th largest import partner for Indonesia. For Korea, Indonesia's position was similar: 7th largest both as export and import market in 2011 (Table 6-3-1).

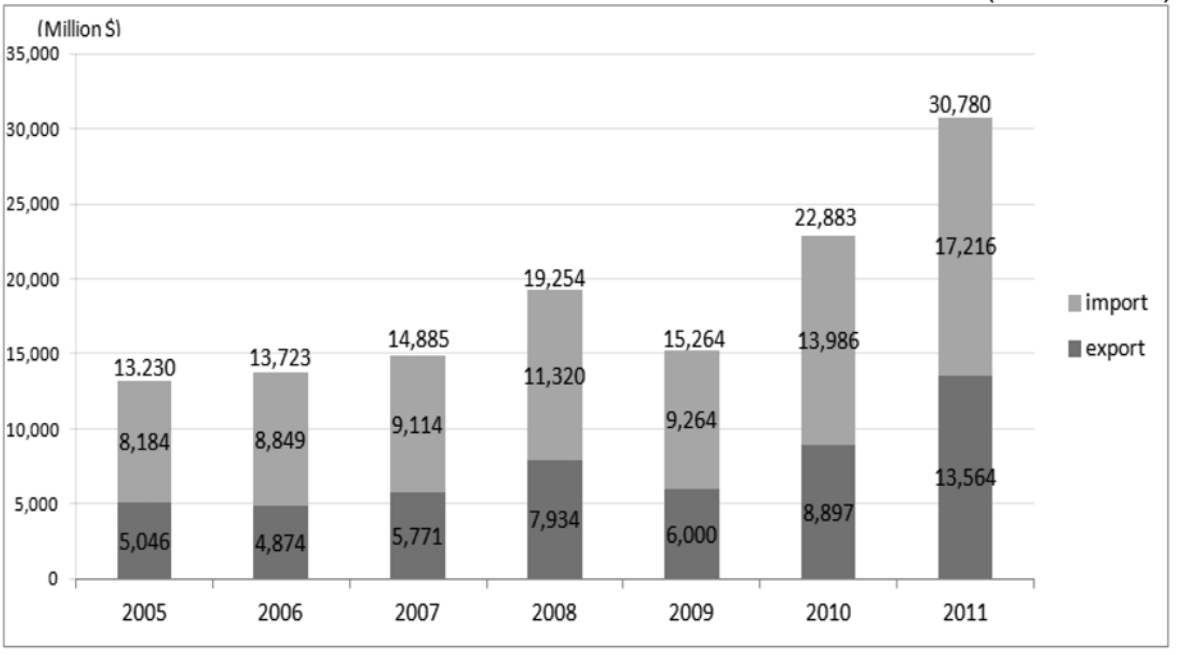
The trade between Korea and Indonesia in 2011 amounted to $30.8 billion and represented about 8% of the Indonesia's total international trade. In 2011, Korea was a country with the biggest trade surplus, which reached $3.6 billion. The bilateral trade volume between Korea and Indonesia increased nearly fourfold in the period of 2001 to 2011. This increase has been fueled especially by the Korea-ASEAN FTA in 2007: the trade volume increased rapidly by 29.3% in 2008 and except 2009, when the global economy fell into a financial crisis, the bilateral trade volume has consistently increased fast.

In 2011, Indonesia was the 7th largest import partner for Korea, after China, Japan, U.S., Saudi Arabia, Australia and Qatar. In the same year, it was also the 7th largest export market for Korea, following China, USA, Japan, Hong Kong, Singapore, and Taiwan. The trade

deficit of Korea with Indonesia increased from $1.6 billion to $4.9 billion in 2010, but in 2011 it decreased to $3.6 billion (UN Comtrade statistics in Table 6-3-2 and Korean statistics in Figure 6-3-1 show a slight discrepancy). .

Figure 6-3-1. Korea's Trade with Indonesia

(Unit:million $)



Source: Korea International Trade Association

Korea's imports from Indonesia are mostly composed of primary goods. In 2011, natural gas took up 30.8% of total imports, followed by coal (20.1%), crude oil (13.5%), copper ore (5.2%), and natural rubber (3.5%), etc (Table 6-3-4). On the other hand, Korea's export items are mostly manufacturing goods. The single largest item was refined petroleum: it took up nearly a half (47.6%) of the total Korean exports to Indonesia in 2011, and it increased by 42.1% from the previous year. The next items in 2011 were petrochemicals (8.6%), iron and steel products (8.4%), fabrics (7.7%), special machines (4.3%), nonferrous metal products (2.7%), etc (Table 6-3-5).

Table 6-3-4. Korea's Imports from Indonesia by commodity

(Unit: $million, %)

		2010		2011		
Ranking	commodity	value	growth rate	value	growth rate	weight
1	Natural gas	2,827	100.5	5,30	87.5	30.8
2	Coal	2,822	31.2	3,467	22.9	20.1
3	Crude oil	2,385	101.7	2,317	-2.8	13.5
4	Copper ore	1,210	5.7	903	-25.3	5.2
5	Natural rubber	368	12634	611	66.2	3.5
6	Pulp	366	101.7	339	-7.3	2.0
7	Ferro-allys	122	48.3	204	67.3	1.2
8	Other coal	209	33.1	170	-18.9	1.0
9	Other petroleum	116	134.8	168	45.2	1.0
10	Nickel	255	77.5	158	-38	0.9
Total		13,986	51	17,216	23.1	100.0

Source: KITA, MTI 4 digit

Table 6-3-5. Korea's Exports to Indonesia by commodity

(Unit: $million, %)

		2010		2011		
Ranking	commodity	value	growth rate	value	growth rate	weight
1	Refined oils	3,212	113	6,462	42.1	47.6
2	Petrochemicals	821	24.3	1,167	57.6	8.6
3	Iron and steel	727	35.1	1,146	18.7	8.4
4	Fabrics	883	27.7	1,048	107.2	7.7
5	Special machines	281	88.3	582	21.8	4.3
6	Metal products	296	63.3	361	5.8	2.7
7	Industrial electronics	290	-0.1	307	36.2	2.3
8	Precision chemistry	205	24.8	279	-15.2	2.1
9	Household electronics	329	8	271	-17.1	2.0
10	Electronic parts	327	19.9	229	-27.2	1.7
Total		8,897	48.3	13,564	52.5	100.0

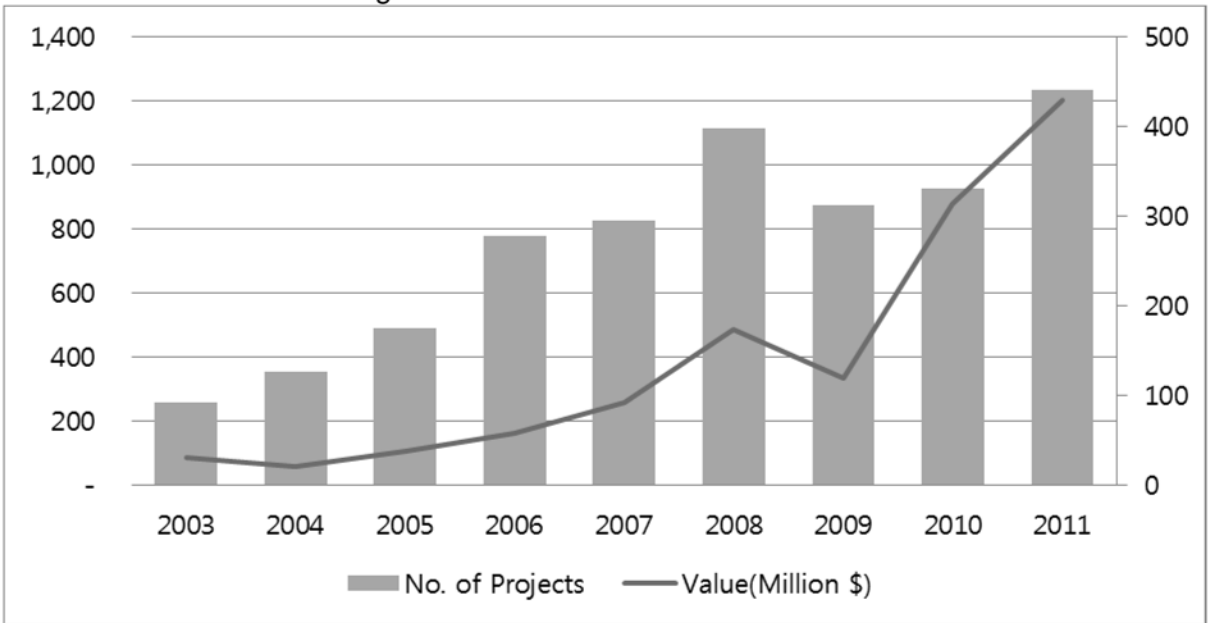
Source: KITA, MTI 2 digit

6-3-3. Foreign Direct Investment Flows

In 2011, FDI into Indonesia recorded $19.3 billion, increased by 20% from the last year. The FDI in the transport, storage and communications sectors reached $3.8 billion, followed by mining ($3.6 billion) and electricity, gas and water supply ($1.9 billion). Indonesia has risen as a significant investment destination of global companies, contributed by its strong economic performance and political stability. In 2011, Singapore was the top foreign investor with $5.1 billion of investment, followed by Japan, U.S., Netherlands and Korea .

Korea's accumulated FDI stock into Indonesia posted $5.7 billion from 1967 to 2011. There were two events that boosted the investment of Korea: Korea-ASEAN FTA in 2007 prompted a dramatic increase in the number of joint ventures, and POSCO, the biggest Korean steel company, began building a steel plant in Cilegon, Banten in 2010. The number of Korean investment into Indonesia increased from 295 projects in 2007 to 440 projects in 2011, while the value increased from $258 million to $1.200 billion in the same period.

Figure 6-3-2. Korea's FDI to Indonesia



Year	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Value	87	58	107	161	258	486	334	878	1,200
No.	93	127	175	278	295	397	312	331	440

Source: Korea EXIM FDI data

Korea is ranked the 1st in the number of projects and the 5th in the amount of investment. Most of the Korean investors consist of small and medium enterprises, but large companies dominate in the total share. At present, there are more than 2,500 Korean companies operating in Indonesia and more than 40,000 Koreans residing in Indonesia.

Korea's investment in Indonesia focused on manufacturing and mining. In 2011, the investment into these sectors recorded $846 million, 70.4% of the total Korean investment and a 400% increase from 2010. Basic metals accounted for the largest share with $499 million (59.0% of manufacturing), which were mostly related to the POSCO project, followed by textile with $176 million (20.8%) and rubber & plastics with $99 million (11.7%).

Table 6-3-6. Korea's FDI to Indonesia ($Thousand, % of Manufacturing)

Industry	2001	2006	2009	2010	2011
Food and beverage	-	2,406	7,577	3,559	2,901
	-	(11.5)	(9.9)	(2.1)	(0.3)
Textile, apparel, and leather	12,188	51,184	30,994	60,800	176,401
	(7.6)	(47.3)	(40.6)	(35.9)	(20.8)
Pulp, paper, and printing	1,000	474	410	-	100
	(0.6)	(0.4)	(0.5)	-	(0.0)
Refined petroleum	-	4,050	9,781	61,233	2,481
	-	(3.7)	(12.8)	(36.2)	(0.3)
Chemicals	11,290	517	5,840	1,524	5,894
	(7.1)	(0.5)	(7.6)	(0.9)	(0.7)
Rubber & plastics	546	348	770	6,164	98,810
	(0.3)	(0.3)	(1.0)	(3.6)	(11.7)
Non-metal product	500	-	3	550	19,335
	(0.3)	-	(0.0)	(0.3)	(2.3)
Basic metals	15,852	6,413	5,188	5,306	499,146
	(9.9)	(5.9)	(6.8)	(3.1)	(59.0)
Machinery	1,831	4,916	20	387	3,465
	(1.1)	(4.5)	(0.0)	(0.2)	(0.4)
Electronics & ICT	109,126	18,344	6,623	12,865	10,728
	(68.2)	(16.9)	(8.7)	(7.6)	(1.3)
Automobile	257	407	1,000	-	-
	(0.2)	(0.4)	(1.3)	-	-
Other transport equipment	159	-	-	250	428
	(0.1)	-	-	(0.1)	(0.1)
Others	7,291	9,170	8,222	16,593	26,627
	(4.6)	(8.5)	(10.8)	(9.8)	(3.1)
Total manufacturing & mining	160,039	108,229	76,428	169,232	846,314

Source: Korea EXIM FDI data

Over the last 10 years, the investment structure has been changed considerably. In the past, textile sector was the largest, but recently the weight has moved to the sectors of primary metal, rubber and plastics and electronic equipment. It implies that with the growth of Indonesian economy and the rise of real wages, global companies are moving their focus of investment from labor-intensive industries to capital and technology-oriented ones.

6-4. Major Issues and Cases

This section is going to examine major issues in the bilateral economic cooperation in the areas of both public and private. As mentioned above, there are already some 2,500 Korean companies operating in Indonesia, with some 40,000 Korean residents. Most of these firms are known to yield good performance from their active businesses, and the early settled companies have endured even the hardship period of the Asian Crisis in 1997-98 there, which contributed to the restoration of the economy. Reflecting on this situation and rapidly increasing bilateral trade and investment, both governments have actively sought the policy measures to promote the business activities of the existing and newly settled companies.

6-3-1. Public Sector Issues

After the conclusion of the “Strategic Partnership Agreement” in 2006, a number of apparatuses to promote government dialogues have been set up including the Joint TF and Joint Secretariat in Jakarta. Comparatively large numbers of meetings, across the Summit, High-level and Working level, were held between the two governments, discussing a wide range of cooperation issues. Some distinct issues among them are:

Korean-ASEAN FTA in 2007

In the 2003 ASEAN-Korea summit, Korea proposed the Korea-ASEAN FTA. Both sides were in need of comprehensive economic cooperation. In the 2004 Korea-ASEAN summit, the commencement of negotiations was announced. After one year, the first round of negotiations started and the framework agreement was signed. This framework agreement was focused on trade in goods and services, investment and the mechanism for dispute

settlement. The negotiation for trade in goods was successfully brought to a close in 2006; it was agreed that Korea and ASEAN would both eliminate tariffs for 90% of all products by 2010. The negotiation for trade in services was concluded in 2007. Additionally, in 2009, the service agreement was implemented and the investment agreement was signed. AKFTA represents a strategic partnership to expand mutual benefits, create new opportunities and promote mutual cooperation in various areas. The establishment of AKFTA has improved their economies and led to the development of trade and investment liberalization.

SME Cooperation in 2008

Small and medium enterprises (SMEs) are considered the backbone of the economy of a country and can account for a considerable share in exports. In this regard, both government sought the measures to promote bilateral cooperation in the SMEs area. The Small and medium Business Corporation (SBC) of Korea opened the Korea Desk in Indonesia Investment Coordinating Board (BKPM) in 2008 through the cooperation MOU in 2007. SBC dispatched management and technology specialists to Indonesia and provided customized solutions based on the on-site diagnosis. The SME cooperation is a new form of bilateral cooperation. Indonesia's SME sector is very large and stable. In 1997, SMEs were considered the main strength against the crisis. For sustainable development, the cooperation of SMEs is very important to the economy of both the investor and host.

KFX Program MOU in 2010

The cooperation in the defense industry has been active in recent years. The Indonesian government plans to modernize the country's armament to protect its national land, maritime and air territories. In this sector, Korea is one of Indonesia's most important partners. In 2009 both countries signed the MOU to jointly develop a 4.5-generation fighter jet with greater capabilities and draft up a contract regarding intellectual property rights. The defense cooperation is focused on production and technology transfer on system requirements, configuration requirements and core technology development.

Korea and Indonesia agreed to produce the KF-X aircraft together. During the first 11 years, 120 KF-Xs are to be built, and additional 130 aircrafts will be produced after reaching their initial goal. Indonesia expects that this joint project will enable the country to become

independent in the defense industry. The Indonesian government allocated the largest portion of its defense ministry's 2012 budget, 7.5 billion dollars, for military spending.

Both countries are willing to share their experiences towards building their own defense industries. Recently, Korea and Indonesia held talks to purchase and sell their aircraft to each other; Indonesia is interested in the T-50 jet fighters of Korea, and Korea is looking to buy the CN-235 aircraft from Indonesia .

Korea-Indonesia CEPA in 2011

Korea and Indonesia are under negotiations for the Comprehensive Economic Partnership Agreement (CEPA). To solidify the relationship between Korea and Indonesia, both countries agreed to conduct comprehensive bilateral relations. In February 2011, Korea and Indonesia agreed to enter into the negotiation for CEPA and held a public hearing in November according to the Terms of Reference. In July 2012, both countries began the first round of negotiation for free trade and investment cooperation. The CEPA will provide a strong momentum for the expansion and deepening of bilateral cooperation to boost up the quality and quantity of mutual trade and investment..

6-3-2. Private Sector Issues

Among numerous business activities performed by private enterprises, here are some cases of big projects which may signify the landmarks of private sector cooperation between Korea and Indonesia, and will bring mutually beneficial advantages.

POSCO Integrated Steel Mill

POSCO has been constructing a 6 billion dollar steel plant in Cilegon, Banten. It is the first integrated Steel Mill in Southeast Asia and the largest foreign investment in Indonesia. For this project, POSCO partnered with PT Krakatau steel and established the joint venture PT Krakatau POSCO. The construction is currently in the first stage of 2010-2013 with a capacity of 3 million tons. The second stage will be started with a capacity of 3 million tons as well. This plant, once completed is anticipated to provide quality steel and iron products to meet the domestic demand that is increasing fast according to the economic growth of

Indonesia. It will certain play an important role in the process of industrial developmentof Indonesia and will help to secure raw materials and market for POSCO as well.

Figure 6-3-1. POSCO Steel Mill Bird's Eye View in Cilegon

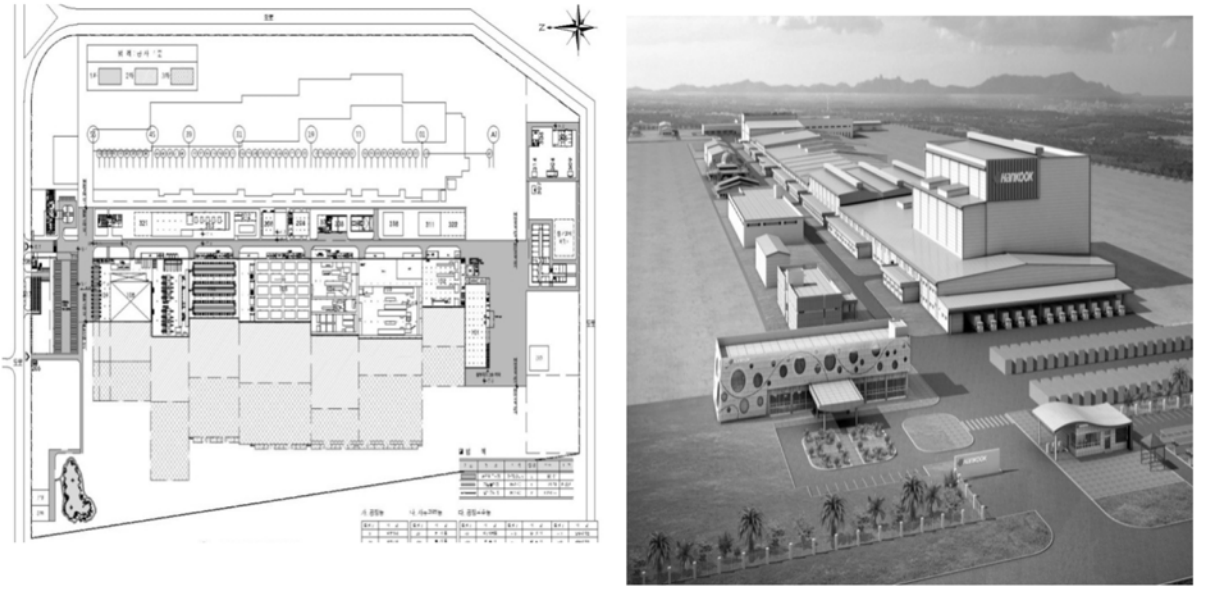
Honam Petrochemical Cracker Complex

Honam Petrochemical is the second largest petrochemical producing company in Asia. The company will begin to build a petrochemical complex in Indonesia in the first quarter of 2013 with an investment of 5 billion dollars (*Jakarta Post*, February 9,2012). The originally expected construction period was from 2010 to 2018, but the construction will be completed by 2016 according to the current schedule. It is considered to be the biggest petrochemical plant in Indonesia. It will occupy 40 hectares of land in Cilegon, Banten. Honam Petrochemical Corp. aims to supply petrochemicals for the domestic market: around 80 % of the output will support the local market. The domestic production of polyolefin is currently dominated by the country's largest petrochemical company, PT Chandra Asri Petrochemical Tbk. The majority of raw petrochemical products are being imported from the outside due to the lack of local production. When the Honam petrochemical complex begins operation, it will supply enough amount to the domestic market. This complex will place Honam as one of the largest petrochemical companies globally..

Hankook Tire Plant

Hankook Tire has decided to build a tire plant in the Bekasi industrial park. The first stage of construction started in 2011 and was completed with in 2012 with an investment of 353 million dollars. It is now ready to start mass production. At full capacity, the plant will produce 6 million tires a year and export to North America and New Zealand from 2014. Hankook Tire chose Indonesia because of its locational advantage. The country is expected to be a hub for the markets of North America, Middle East and other neighboring countries. The Bekasi plant will be Hankook's seventh international plant and will contribute to satisfying both local and global market demands. The company will continue its next phase of construction with a total investment of 1.1 billion dollars until 2018. The facility is expected to produce 16 million tires annually.

Figure 6-3-2. Hankook Tire's Construction in a Bird's-Eye View



Solar Power Cooperation

In May of 2011, Samsung C & T and the Indonesian Ministry of Energy and Mineral Resources signed a MOU for cooperation in the solar power industry. In 2012, they completed licensing and started construction. Samsung C & T made an investment of 150 to 180 million dollars in this project.

Solar energy has a high potential to produce cheap electricity by converting sunlight. Currently, the major source of energy in Indonesia is oil, gas, and coal, but the government has put in a sizeable effort to develop and deliver green and clean energy. The provinces of Java and Bali are considered the most suitable sites, but the size has not been decided yet. This solar power cooperation is also expected to take up an important a part in the development of the local manufacturing and infrastructure environment.

Cooperation on CNG vehicle

Indonesia is one of the major countries that have and export a large amount of natural gas Its government is concerned about the increasing usage of fossil fuel and has adopted the Korean CNG conversion project. The Korean government has carried out the CNG vehicle promotion program for more than 10 years, and around 30,000 CNG buses are being operated. In 2012, Korea will supply 14,000 CNG vehicle conversion kits to Jakarta, Banten, Java west and Java east in Indonesia. Next, the Korean government will provide the parts for CNG cars to local manufacturers. This cooperation program is expected to contribute to the creation of various jobs, prevention of climate change with use of CNG vehicle and diversification of energy sources.

Cooperation on Industrial Technology Transfer

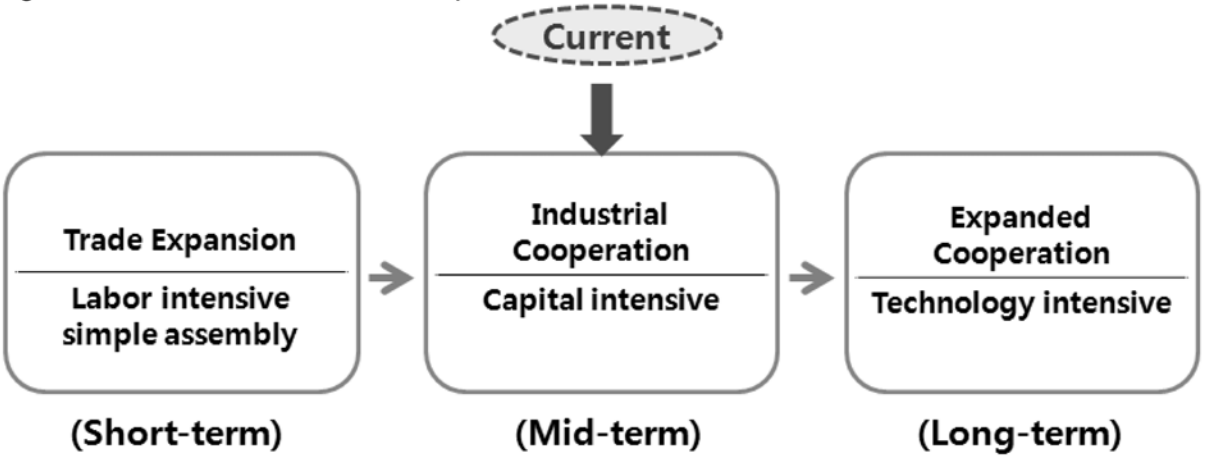
In May 2011, The Korea Institute for Advancement of Technology (KIAT) and MASTEL of Indonesia signed an MOU to strengthen industrial technology transfer and cooperation. They agreed upon the idea of sharing technology infrastructure and capabilities. The Indonesia-Korea Technology Center (IKTC) was founded as a channel for technology cooperation. In the first stage, both found it necessary to promote the cooperation for the transfer of technical knowledge in mobile contents, TV and NBN. For this, KIAT agreed to participate in the Indonesian WIMAX project. A seminar to raise awareness of technology transfer was held in October that year. Further cooperation is expected in areas such as medical and health technologies.

Figure 6-3-3. Technology Transfer Road Show

6-5. Expanding Bilateral Cooperation

The conceptual framework of bilateral cooperation can be divided into three stages. The first stage is to expand trade between both countries with the mutual industrial cooperation focusing on the large labor intensive structures. The second stage represents the industrial cooperation with a capital intensive structure. In this stage, the types of investment are changing from labor intensive sectors to mid and high technology-oriented sectors. The last stage shows increasing interdependence. The cooperation structure is heavily focused on high technology and illustrates deepened cooperation in all sectors.

Figure 6-4-1. Current Status of Cooperation between Korea-Indonesia



Now, the bilateral cooperation between Korea and Indonesia is seen to be in the second stage moving on to the last stage. The promising cooperation areas include CEPA, development cooperation, fostering of strategic industries, and the expansion of new trade areas.

6-5-1. Early Settlement of Korea-Indonesia CEPA

First, Korea and Indonesia's bilateral cooperation of CEPA should be concluded as soon as possible. Both countries already concluded the AKFTA in 2007. But in order to augment benefits and utilities, there should be a higher level of bilateral cooperation through CEPA. In fact, CEPA is not much different from FTA; simply it implies closer economic ties than regional FTA. The CEPA will increase the volume of bilateral trade, create larger and new markets, and through the elimination of tariffs and not-tariff trade barriers attract more investment. The expected effect of CEPA is a favorable framework for investment and trade and improvement in the efficiency and competitiveness of manufacturing. Therefore, the early settlement of the CEPA is recommended to ensure the stability of investment and to liberalize and facilitate trade in goods and services

6-5-2. Fostering Strategic Industries

For Indonesia's continued economic growth, the fostering of key-industries is necessary. Until now, the country has focused on labor intensive industries such as agriculture and textile industries. But, recently, the cost of labor in Indonesia has risen in accordance with the fast growth of its economy. This trend is posing a serious concern on the possibility of sustainable economic growth, and raises the issue of industrial structure advancement to high value added one in the value chain

Even in this area, bilateral cooperation from both public and private sectors will be of great interest for both sides. For Indonesian side, proper strategies and policy measures selectively focusing on strategic industries and stimulating the inflow of foreign investment and technology transfer will be needed. For Korean side, participation in the process of industrial upgrading of Indonesia by way of enterprise investment and policy consultation will be also helpful to secure the expanding market and reliable partner. The four industries selected for this research, which are shipbuilding, automobiles, consumer electronics, and

textiles, are those strategic industrial areas that Indonesian government has great interests for the acceleration and expansion of economic growth. In this regard, this consultation project is a good case of bilateral cooperation to be continued.

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6-5-3. Sharing Development Experience and Knowledge

The third cooperation area can be found in the exchanges and sharing of the development experience and knowledge of both countries. Indonesia and Korea have similar and different histories of economic development policies, each side having its own history of success and failure stories. During the 1960s Korea's industrial development was focused on export-oriented labor-intensive light industries. Then from the mid-1970s, the Korean government promoted heavy and chemical industries, providing policy loans and various incentives to selected strategic industries. Recently deliberate government policies to promote technology-intensive industries through such legislations as "software industry promotion acts" and "eco-friendly vehicle development acts" helped to provide Korea with world class industrial competitiveness. Despite its successful performance so far, the Korean economy has been facing also significant challenges to keep sustainable growth.

Indonesia has implemented similar economic development plans. Starting from 1969, the Indonesian government has continuously announced five year plans (Repelita). The 1st development plan was focused on economic reconstruction and export-oriented industry development, and the third development plan put a goal on the expansion industrialization. Through the process, Indonesia strengthened the excavation and export of resources and thus a resource-based export oriented trade structure was solidly established. However, a problem occurred during the 6th round of the development plan with the fluctuation of international commodity prices. Nowadays, despite the buoyant economy and consumption boom in the recent years, there are also concerns on how to keep the sustainable economic growth that have been largely propped up by the exports of resources.

Policy dialogues to share the knowledge and experience of experts from both public and private sectors of both countries will surely help to understand the success and failure causes of industrial development in both countries. In this respect, the Korean government has been expanding a variety of knowledge sharing programs, of which this joint research is an important part in the bilateral relationship with Indonesia.

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6-5-4. Development of New Cooperation Areas

Last but not least, it is important to develop new areas of cooperation. The cooperation between Korea and Indonesia needs to go beyond simple trade and investment. Defense, green, and cultural industries should be the next sectors for cooperation. The level of defense cooperation has increased conspicuously in recent years. Indonesia signed the contracts to buy T-50 Golden Eagles for 400 million dollars in 2011. Indonesia is the first and largest country to purchase Korea's aircrafts and submarines. As defense cooperation normally accompanies a variety of follow-up cooperation programs including technology transfer, personnel training, it can be mutually beneficial and is expected to be a very promising area both in the short and long term.

Secondly, the cooperation in the green industry is another crucial field. In the third TF meeting in Jeju Island in October 2012, green cooperation was one of the main agendas. The Working Group on Industrial Cooperation also dealt with green cooperation with the CNG vehicle. Currently, the Indonesian government is in the process of converting gasoline based vehicles to CNG vehicles. This conversion policy of Indonesia is expected to formulate eco-friendly transportation systems utilizing abundant natural gases. Korea has a long history of eco-friendly transportation systems such as the CNG buses which have been operating from 2000. Air pollution will be significantly reduced through usage of CNG buses in Indonesia. For cooperation, the Korean government recently asked for the detailed schedule plan for CNG vehicles. The green agenda will also deal with water pollution through the management of industrial waste water and river pollution. Above all, it is necessary to promote awareness of bilateral environmental cooperation.

The last cooperation area is the culture industry. To expand bilateral cooperation, cultural (emotional) exchange is very important. Korea can offer K-pop, fashion, movie, cosmetics and sports (tae kwon do). Indonesia also has a rich culture; it has clothes with beautiful and practical textile designs, dynamic traditional folk dance, sculptures and paintings. Through festivals and seminars, both countries can increase the level of cultural exchange. Such exchanges rather than one-way advertisement are recommended to enhance mutual understanding.

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