Transformative Capacity of the State and the Development of Korean IT Industry

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* This paper was presented in 2008 Global Institute for Asian Regional Integration (GIARI), August 25~30 at Waseda University, Japan. I'm heartily thankful for comments of participating professors and students.
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Abstract

Today, information technology effects not only the political economy but also highly the field of socio-cultural area in South Korea. Many multi-national corporations have sought South Korea as the testing grounds of new information technology. Korean government recently has provided third world nations with knowledge and support for developing IT industries.

Korean IT industry has developed rapidly since late 1990's. The developmental strategy of the state was behind the background of this success. But while the image of 'strong state' which represents President Park's model from 1960's to 1970's is weakened, it was changed into 'limited developmental state' or 'flexible developmental state' under the global competition. IT industry is one of these developmental strategies.

This article focuses on the growth factor of the IT industry after the late 1990's. According to Weiss, while Korean government could control and plan the economy through the Korea Economic Planning Board (KEPB) from 1960's to 1970's, its capability was damaged after repeal of KEPB in 1994. But I think that this ambiguous view did not fully explain the development of Korean IT industry. The choice of IT industry can be understood as the results of institutional operating capability by strong nation-state as well as international division of labor in the world system.

Although Korean IT industry seems to be successful by looking at external figures, some limitations are actually existed such as the lack of distributive capability in social and economic field.

Key words: ***IT industry, developmental strategy, flexible developmental state, governed interdependence***

1. Introduction

In Nov. 2006, cellular phone users in South Korea were over 40 million, or the rate of joining membership 82.3% (5. Dec. 2006. *Korean Economy*) and South Korea was highly ranked in the field of IT manufacturing among OECD countries. According to a current report published by Korea Information Society Development Institute(KISDI), domestic IT production in South Korea there might be expected 3.0% growth in broadband internet as well as 3.5% in mobile and WCDMA (wideband code division multiple access). For the prospects of *WiBro* (Korean brand of portable internet), the new service in next-generation convergence, will reach up to $12 billion in the whole IT market size and 608 thousand subscriber registrations (5 Dec. 2006. *Digital Daily*).

In this manner, at least the external growth of Korean IT industry was undeniable in many people including international experts. Ever since 1997 IMF crisis, Kim Dae-Jung administration had promoted telecommunication industry and informatization as a key project. Entering upon 300 billion dollar era, the IT industry seems to function as a pivotal role in Korean economy with conventional heavy industries such as shipbuilding, steal and automobile.

If so, what are factors for success in Korean IT industry since IMF crisis? How could Korea gain the achievement of IT industry? What factors do influence on the development? The theory of developmental state can be applied or cannot to this case?

This article is written as putting an effort on seeking an answer through the arguments about transition of countries in East Asia under globalizing political and economic circumstances. The globalization, in particular financial globalization, created threatening atmosphere to 'developmental model of the state' in East Asia. Although the developmental state controlled enterprises by utilizing credit distribution capacity in the past, there was no reason for a company to obey the state unconditionally due to the reliance on international capital. In addition, entering from authoritarianism to democracy, the state was faced with adjusting the developmental strategy model (Ann, 2006).

The development of Korean IT industry seems to be related with these contexts and limitation of the developmental model. So, this study is aimed to analyze growth factors in Korean IT industry after 1990's. Although implementing predominant developmental strategy of the state by contrast the capital, Korea is considered to be in process of transforming the strong state which represents President Park's model in the developmental era into limited developmental state or flexible developmental state.

I would like to suggest the transformative capacity through the concept of "governed interdependence" (Weiss, 1998) which was found in East Asia. The governed interdependence which can be applied to Japan and Taiwan including Korea have an advantage in explaining active role of the state for adapting external environmental change. This study did not make an attempt at variable focused analysis for verifying hypothesis purpose. However, I would like to prove its validity by presenting detailed date and facts which are related to support my argument.

2. Theoretical Backgrounds

1) The Review on the developmental state in East-Asia

Researches on developmental state were actively progressed with an approval about the essentials of a state's intervention for explaining economic outcome and industrial transition between East Asia after 1980's. According to C. Johnson (1994), the primary goal of developmental strategy was mainly focused on economic growth, productivity and competitiveness. Moreover, the key was strategic industrial policy.

Amsden (1990; 1994) proposed that Korea could be characterized as 'disciplined market economy model' on the basis of planning rationality. Different from the free market economy, market rationality could be restricted by the priority of industrial policy in the disciplined market economy. According to his argument, Korea government selected a target industry and provided it with various recourses and advantage in attempt to promote relevant industry. It was appeared to be cooperation for the investment of IT industry between the state and the capital unlike Western (Anglo-Saxon) model and actually the state led the capital in South Korea.

Wade (1990) also said that industrial policy was decided by the discretion of distribution and the political power apart from market principles. Deyo (1987) also showed that strategic industrial policy or governmental intervention on purpose of development was obviously appeared in Korea.

However, the powerful and intervening of Korean government faced with a drastic change in business structure and international environment after mid-1980. By external pressure on alleviation of economic intervention, industrial transition from heavy chemical industry to high-tech industry, social movement for democracy and success in economic development itself, Korean government could not maintain any more the intervening policy in the market. Additionally, Private sector such as big conglomerates in this process grew up substantially with capacity of confronting the state in Korea (Kim et al., 2005: 73-76).

I think that the characteristic changes in East Asia can be explained by the concept of limited or flexible development state (O'Rian, 2000; Ahn, 2006), not the meaning of regulatory government in western countries. From the early 1990's, some countries including South Korea in East Asia started to switch 'bureaucratic developmental state' into 'flexible developmental state'.

The flexible developmental state has capability of forming a network for the production and technology innovation, attracting foreign investment, and stimulating domestic growth. By providing information about transnational corporation and world market to domestic firms, it made the condition for stimulating connection between domestic and international companies. While the government put the decision of opportunity use to each firms, it offered any inducement with macroeconomic policy to TNCs. Hence, the managerial role of the state is limited to build on infrastructures and is focused on attracting investment of TNCs (Deyo & Doner, 2001). In thinking about state capacity, many scholars note that capacity also depends on the organization of groups in society.

I think that the concept of flexible development state or transformative model is obviously surfaced the industrial policy which has been promoted by President Kim Dae-Jung after IMF crisis, particularly in IT

industry. In my opinion, the institutional operating capability proposed by Weiss (1994; 1998) has a critical effect on IT industry policy in Korea.

2) The Usefulness of Governed Interdependence theory

Peter Evans (1995) argued that state capacity in the industrial arena is founded upon a set of institutions which simultaneously insulate the economic bureaucracy form special interests, and establish cooperative links between bureaucrats and organized business. States which are more effective in achieving their transformative goals tend to be not only sufficiently autonomous to formulate their own goals, but also sufficiently embedded in particular industrial networks to implement them; 'embedded autonomy'

Receiving and revising the concept of embedded autonomy, Linda Weiss (1998) proposed the concept of "Governed Interdependence." Governed interdependence (GI) refers to a negotiated relationship, in which public and private participants maintain their autonomy, yet which is nevertheless governed by broader goals set and monitored by the state. GI is intended to convey a reality in which both state and dominant economic groups are strong; i.e. the state is well insulated and industry is highly organized and linked into the policy-making framework via a robust negotiating relationship; MITI in Japan is a classic example (Weiss, 1998).

Economic Planning Board (EPB) of Korea was similar to MITI of Japan. The EPB was chosen by President Park to be a super agency and had power to coordinate economic policy by control of the budgetary process (Evans, 1995). Weiss argued that after the abolition of the EPB in 1994, the transformative capacity of Korea was damaged considerably.

This ambiguous attitude, however, does not well explain the development in IT industry after the economic crisis in 1997. If the strong institution like the EPB were disappeared, how could the state put resources into a target industry? In my opinion although the state capacity was actually damaged, another form of institutional organization coordinated economic policy. Typical example was appeared during progress of promoting IT industrial policy.

However when compared to President Park's administration, its characteristic was not vanished rather than was a little bit changed. Shown as <Table 1>, while institutional insulation (autonomy) was relatively high during the developmental era, institutional linkage (connection) was relatively high after IMF crisis.

<Table 1> Comparison governed interdependence according to periods

	Institutional isolation	Institutional connectivity
Developmental Era (1960~1970)	▲	▽
After Economic Crisis (1998~present)	▽	▲

※▲: Relatively high, ▽: Relatively low

For instance, institutional isolation (relative autonomy) was unified with EPB as a central and practiced a coordinative function for overall industrial sector during President Park's administration. In contrary institutional connectivity (organizational network) somewhat practiced a function partly, but it was rather based on enforcement of the state than result of coordination in that time. It can be said that during this period large scale of investment was needed for encouraging heavy chemical industry which required intensive labors and capital and the control of financial investment was operated as the important mechanism of GI system.

But after the IMF crisis, while the institution which charges overall industries at the centre like EPB was disused, institutional connectivity (systematic bond which connects government, industry and policy network etc.) was relatively expanded. Since IT industry was promoted as a national policy in South Korea, the number of institutions that were charged on collecting information and executing policy more were established than before. The work force was also specialized as well many corporations participated in IT industry actively and competitively.

None the less, the coordination system of information and communication technology was considerably damaged by the IMF crisis. As a result, each ministry and office related with IT industry had confusion over coordinative function and their work got sometimes overlapped. Although IT industry was specialized field and difficult to operate properly by taking orders of state, Korean government took a strategy of expanding institutional connectivity to bring large conglomerates and public research centers together. This strategy seemed to be somewhat successful for developing IT industry.

3. The Governmental Institutions of Korean IT Industry

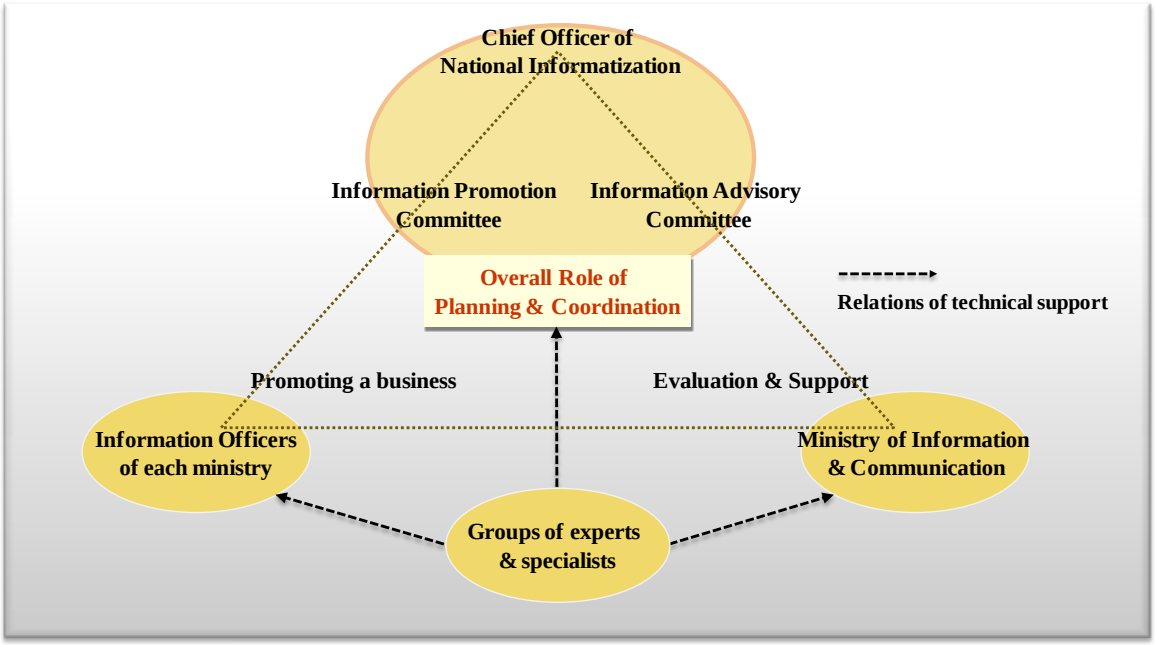
According to a study on the system for National Informatization Promotion, the pan-government system for informatization is composed of triangle axes which are the pan-government organization, promoting information-oriented competent ministry and information organization of each ministry and office. Each organization has professional institution which support with information technology and IT skilled work force. The basic structure of promoting information policy is described in <Figure 1>.

Kim and Lee (1998) said that one of the implications in the progress of promoting national informatizaton policy was that an existence of strong policy coordination institution operated well information industry. The other was that policy coordination function depended on whether or not is supported by president's leadership.

In contrary to before, current telecommunication and information technology advancement policy is vertically as well as horizontally dispersed. In 1996, the system of national informatization promotion was laid out by reinforcement basic law of promoting informatization. The system made and practiced primary policies for IT industry through adjustment and discussion of several organizations like Ministry of Information and Communication, central administrations and local governments, and National Information Society Agency etc.

The committee of promoting informatization was the supreme institution of deliberation and was composed of Prime Minister as a chairman and 24 committee members including each minister of state. And the representatives for related ministries and academic experts could participate in the information strategy meeting under the superintendence of the President.

<Figure 1> the system of National Informatization Promotion



※Source: Kim & Lee (1998)

As well as, many institutes were related with practicing the information policy including Institute for Information Technology Advancement (IITA), National Information Society Agency (NIA), Korea Information Society Development Institute (KISDI), Korea Information Security Agency (KISA), Korea SW Industry Promotion Agency (KIPA), Korea Agency for Digital Opportunity and Promotion (KADO), National Internet Development Agency of Korea (NIDA) under Ministry of Information & Communication; Electronics and Telecommunications Research Institute (ETRI), Korea Institute of Science & Technology (KIST) under Ministry of Science & Technology; Korea Game Industry Agency (KOGIA) under Ministry of Culture & Tourism; Korea Institute for Electronic Commerce (KIEC) under Ministry of Commerce, Industry, and Energy.

<Table 2> shows reshuffle or newly established state-run institutions related with IT industry after 1990's. These institutions practiced as substructure role in order to gather information and speak for development & advancement of IT industry. To sum up, the system of promotion and adjustment for information policy appears to be closer to as well dispersion of function and authority as horizontal adjustment type.

<Table 2> state-run institutions related with IT industry

Affiliated Ministry	Name of Institutions	History of Institutions
Ministry of Information & Communication	Korea Agency for Digital Opportunity and Promotion (KADO)	Feb 1992 Reorganized as Korea Information Culture Center Jan 2003 Elevated as a higher organization named Korea Agency for Digital Opportunity & Promotion
	Institute for Information Technology Advancement (IITA)	Nov 1992 Launched as an IT R&D management division, the predecessor of IITA, affiliated with ETRI Jan 1999 Establishment of Technology Commercialization Support Center

	Korea SW Industry Promotion Agency (KIPA)	Sep 1998 Korea Software Center Established
	National Internet Development Agency of Korea (NIDA)	Jun 1999 Received Approval from MIC as a non-profit foundation
	Korea Information Security Agency (KISA)	Apr 1996 Founded the Korea Information Security Center
	Korea Information Society Development Institute (KISDI)	Feb 1985 The Institute for Communication Research was established Aug 1997 The official name of the institute was changed from the IT Development Research Institute to the Korea Information Society Development Institute
	National Information Society Agency (NIA)	Jan 2006 Agency name changed to National Information Society Agency(NIA) Jan 1987 National Computerization Agency(NCA) Established
Ministry of Science & Technology	Electronics and Telecommunications Research Institute (ETRI)	Dec 1976 KECRI Established, an Affiliate of KIST Mar 1985 ETRI Established(MOST, Consolidation of KIET and KETRI Jan 1999 Affiliation Changed to KOCI of Office of the Prime Minister
	Korea Institute of Science & Technology (KIST)	Feb 1966 The Korea Institute of Science and Technology was founded Jan 1981 After being integrated with the Korea Advanced Institute of Science, the organization was renamed as the Korea Advanced Institute of Science and Technology
Ministry of Culture & Tourism	Korea Game Industry Agency (KOGIA)	Jan 1997 Establish scheme for game industry development(including the build-up of integrated game support center) for game industry promotion July 1999 Opening ceremony of Integrated Game Support Center Inc Apr 2007 Changed the name to the Korea Game Industry Agency
Ministry of Commerce, Industry & Energy	Korea Institute for Electronic Commerce (KIEC)	Jan 1991 Established Korea EDIFACT Committee(KEC) Aug 1999 Renamed Korea Institute for Electronic Commerce(KIEC)

※ Source: Data of each institutional homepage's corporation introduction

Next, in connection between the state and the industry, IT industry of Korea has been developed remarkably since the mid-1990. In the development process of IT industry, the state's regulation and support has been strongly worked on private sector. Particularly, the basic plan for IT promotion was based on the basic law of information promotion and established in every 5 years. Based on this plan, each ministry planned Rolling plan each year.<Table 3> shows contents about the basic plan of IT promotion on stages (Lee & Kim, 2006). Also it shows that the state set its target by itself with the basic plan of IT promotion like past 5-year economic development plan and wanted to perform an adjustment role as granting duties to each industry.

<Table 3> the master plans of IT promotion

Master plan	Basic plan of IT promotion	Cyber Korea21	e-Korea Vision 2006	Broadband IT Korea Vision 2007
Time point	1996.6	1999.3	2002.4	2003.12
Period	1996-2000	1999-2002	2002-2006	2003-2007
Features	Selection & Support of urgent IT industry-priority-task	Contribution on the job- creation & economy-invigorating for overcome IMF	Setting a new vision and goal for informatization	Planning the road map of e-government and next convergence technology

※ Source: Ministry of Information and Communication (2000)

The participation in private sector is essential in order to exercise the basic plan of information promotion. So the state took the trouble to support policy for bringing participation of corporations out in the beginning of business promotion. For example, the commercial adoption in the mobile and information service of CDMA type was evaluated as successful project with the private sector because Korean government invested $99 billion for research and development business from 1989 to1996, and domestic conglomerate manufacturing corporations such as LG, Samsung, Hyundai, Maxon etc. were collaborated under head of ETRI. The success of CDMA was closely related with reconstructing structure throughout the third to the fifth round plan of IT industry. Since the competition of mobile communication companies started in 1995, the government-led policy was converted into the corporation-led policy which aimed the network expansion and efficiency in the IT industrial market (Lee & Kim, 2006).

<Table 4> shows the developmental goal and strategy through reconstructing plan of the information and communication industry by periods.

<Table 4> the restructuring plans of the information and communication industry

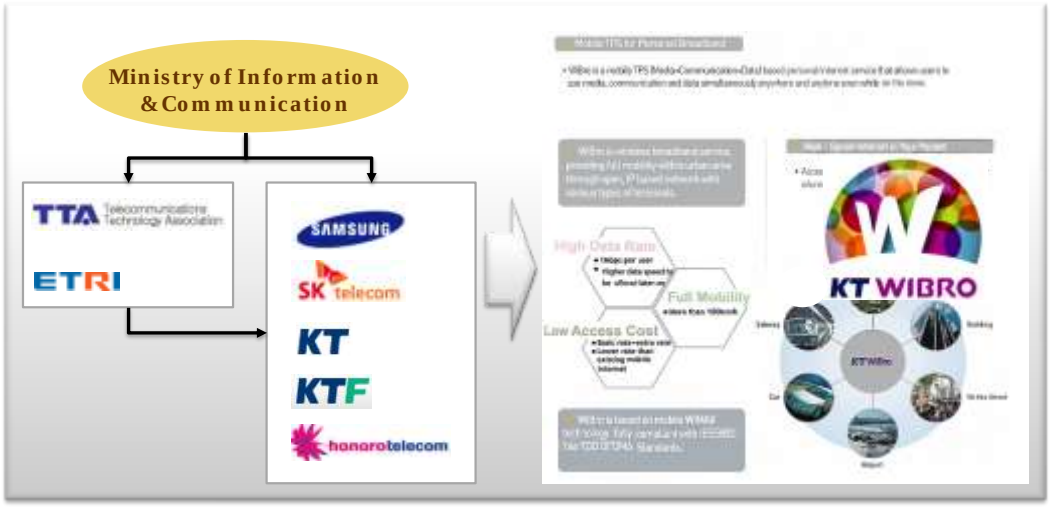
Restructuring plan	Goal and content of the policy	Actor	Policy environment	Policy process
First (1990~)	by exclusive of preexistence, introduction of market principle in the supplier-centered telecommunication business	government	Opening liberalization	Government -led
Second (1994~)	Improvement of corporation classification structure which cannot cope with technology development and the government regulation in telecommunication market	government-enterprise	Limited competition	Government -led
Third (1995~)	Forming competitive wire service business structure and active correspondence for the world wire service market	government-enterprise-people	Competition expansion	Enterprise -led
Fourth (1997~)	Permitting license for fundamental telecommunication (pre-announcement deregulation & free application system, deregulation on quota for number of licenses) and faire competence	government-enterprise-people	Overall competition	Enterprise -led
Fifth (2001~)	Establishment of self-regulating reconstructing telecommunication industry by market and valid competence structural system	government-enterprise-people	Validity competition	User -led

※ Source: Lee Myung-Ho, Kim Tae-Hyun (2006)

Another example with linkage between the state and the industry is *WiBro* international standardization (Figure 2). The Korean government decided policy guideline which utilizes 2.3GHz, or trunk radio frequency,

as portable internet use in 2003 and promoted new IT power developmental strategy as a key industry. An index of technological standard in that time was considered very importantly since it gave a critical decision for economic investment. ETRI as well as many corporations including KT, SK telecom, Hanaro telecom, Samsung Electronics were participated for the technology. Still in order to increase volunteered participation and deliberation among relevant industries, 2.3GHz portable internet committee or project group which were composed of related business, manufacturer, and academic experts were operated under Telecommunications Technology Association (TTA) (Korea Research Centre, 2003; Choi, 2004).

<Figure 2> the case of *WiBro* (portable internet)



Since the IMF crisis, Korea has been promoted development of IT industry with relatively soften GI system compared to developmental era. This is a little bit different from developmental strategy based on institutional isolation in the past. In other words, the state has promoted successfully in part the development of IT industry by expanding its institutional connectivity because of that IT industry is intensive technological field, and developmental strategy by enforcement cannot be implemented for democratic process.

4. The Semi-Success of IT Korea

Developmental states in East Asia had to face with structural change of international division of labor in 1990's. With the start of Japan in 1960, Asian economic growth passed through NICs and diffused to Malaysia, Thailand, and Indonesia. Then East Asian economy was converted into export-dependent structure and intra-trade in area increased. But without clearly classifying comparative advantage, industrial structures were overlapped by mutual competition in heavy chemical industry (Kim, 2003; Cummings, 1987).

To overcome difficulties, many countries launched IT industry at the same time. High-tech industry such as aviation, computer, and bio-technology has been considered as important factor for economic development with high additional value and technological basic capacity (Bae, 2003). Although it was not easy for

developing countries to get into these industries, several countries (Korea, Taiwan, Singapore, India and Brazil etc.) achieve success and fortified its status in the world economy system (Kim, 1990; Wallerstein, 1980).

However since Korean IT Industry was established by the industrial policy which a technology was intensively invested on specifically designated area, R&D capability was unfairly arranged only limited sector.

KISDI (2003) reported that the expansion and diversification of IT industry has been experiencing difficulty. While the gap of core technology between advanced countries and Korea still is maintaining, Korea was followed by the pursuit of developing countries like China. As a result, there would be some concern about the continuous growth in the future.

Firstly, looking at the internal perspective Korean IT industry was only limited on specific fields as like mobile communication or internet services. According to the analysis about IT industrial structure among OECD countries, Korea was more vulnerable in the fields of software and IT service than IT manufacture and mobile communication. Also some problems were pointed out, for example the poorness of domestic market against the actual export record, lower level of technological innovation for quantitative outcome and disadvantage labor market which had serious problems for upbringing human resources (Lee & Kim, 2006; Kwon, 2003). Also according to the research on the causes of Korea's IT industry, considerable parts of highly quantitative growth would be attributable to capital investments. After the economic crisis in 1997, the growth ratio by the increase of total factor productivity rather has been decreased. This kind of growth depending on quantitative investment was salient in small and medium IT enterprises. Heated venture atmosphere from this indiscreet investment went down rapidly due to excessive investment and unsatisfied productivity of venture companies (Hong, 2003).

Secondly from the external view we can find new competitors like China or India are emerging in the IT industry. Mobile phone and semiconductor as representative business in the IT industry are experiencing a difficulty with the serge of China IT industry. Some enterprises are moving its production base site into China. According to the current report, a great number of Korean companies still have conducted the R&D activities not moving to China, but R&D with low-price production would be showed its intention to move to China. And in the case of mobile phone design companies which have no productive function, not production facilities but human resources moved to China. Even in exporting items, some products of big conglomerates such as semiconductor and mobile phone and display which have been played a major role in the world market acquired only strong position. On the contrast, the domestic market which are based on small and medium enterprises has been stagnated, so the imbalance of items between and within corporations growing worse than before (Lee & Kim, 2006; Park, 2006).

Like this, while the outward growth of Korean IT industry may show the similar pattern as past 1960-70's development at first glance, the extending effect of IT industry revealed not so big compared with that of the light industry or heavy chemical industry in the past.

The IT industry came up to save Korean economy which was fallen into the crisis. As to external side, its mission seemed to be successfully conducted. But the fruit gained by the quantitative growth was not diffused across the whole society. Substantial economic effect is dubious and social inequality such a digital divide was not solved. In this viewpoint, the transformative capacity of Japan and Germany would have many suggestions

in the future.

Weiss (1998) proposed that Japan and Germany have a unique form of capitalism by combining the growth-oriented policies with strong distributive politics. That is, Japan and Germany devised their own style of institutional operating capacity so that they could combine developmental ability with distribution capability. Then South Korea also could show the balanced transformative capacity as like Germany or Japan? Or South Korea would be possible to become as a limited or flexible developmental state?

About this subject, I'm somewhat skeptical. I think that although South Korea would still have a transformative capacity with low level of GI system; it seemed to have its limits to create a balanced system as like Japan and Germany. It is difficult for South Korea to overcome political and ideological boundary for the situation with the division of Korean peninsula, so there is some doubt whether the distributive system of the state would go well. Even though the institutionalization may be successful, it would be possible to be the results of political negotiation rather than sufficient deliberation.

5. Conclusion

Nowadays, IT technology highly influences on every aspects in Korea including not only the political economy but also the socio-cultural area. This article tried to analyze the causes of what made South Korea leap rapidly into the development of IT industry.

The concept of governed interdependence suggested by Linda Weiss (1994; 1998) was useful for this analysis. Although Weiss used GI system as the concept for expatiating the economic management capacity controlled by EPB during President Park's regime. After the IMF crisis, Korean government showed the transformative capacity by implementing relatively flexible developmental strategy in the IT industry. At least, in terms of external view South Korea has been successful in IT industry.

Institutional capacity for industrial organizations would reveal through bureaucratic coordinative structure or state-industry linkage and industrial organizations. These characteristics can be shown in the process of national informatizaton policy in Korea. For example, organizational system for national informatizaton policy is vertically as well as horizontally dispersed and is composed of the structure of making and practicing IT policies through adjustment and discussion of several organizations such as ministry, local government and other experts.

Particularly CDMA service and WiBro can be considered as the successful case. In these cases, the state provided strategic support during the initial stage in order to encourage company participation. This is seemed to be different from the developmental strategy of President Park which is based on institutional isolation (relative autonomy). Rather, Korean IT industry was successfully developed by expanding institutional connectivity (organizational network).

However, it is evident that the strategic industry in Korea was not determined by itself. Rather, it was forced to select by the structure of international division of labor in the world economic system. Since 1990's, Korea had to participate in technological-intensive industry to overcome the pressure of late-comers such as China, Southeast Asia, and India under labor-intensive division. It is obvious that the structural shift was

created by American hegemony. Throughout this article, it is empirically revealed that even though IT industry has high proportion in Korean exports, the economic and distributive effects of IT industry actually was not huge. In conclusion, it is not clear whether Korea can have a transformative capacity such as German or Japan that has both developmental and distributive capacity.

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