

The Role Of Innovation In The Development Of South Korea

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Abstract

In recent years, innovation and innovative science have completely become a manufacturing factor. Countries which comprehended the importance of innovation activities earlier than others and which developed their policies accordingly are now among developed countries. And, South Korea has become one of the most important ones of these countries.

The subject of this study covers the South Korean economy, the role of innovation in the development of South Korea and development processes of innovation in South Korea.

Keywords: Innovation, South Korea, Development, Development Processes

1.INTRODUCTION

Economic growth can be achieved in long term mainly through information and innovation of new technologies. Today, countries with high technology levels are on their way to gain total control of all economic areas, starting with the industry. In brief, technology has become the single and the most important determinant of competitive advantage among countries. Therefore, countries with a technological superiority play a determining role on an international level not only in the increase of social welfare and life standards but also in the distribution of World's limited resources.

Innovation has a huge place in the economy and development of South Korea which took its place among G20 countries. South Korea has understood the importance of innovation at a very early stage and built its development exclusively on innovation and change processes.

1.1. SOUTH KOREA ECONOMY

After World War II, Paris Peace Treaties were signed as a result of Paris Peace Conference in 1945. Upon the recommendation of Truman, powerless countries were given the chance to determine their own future. With this decision, South Korea gained its independence like tens of others. Between the years 1945 and 1953, Korea had a very weak economy and an unsatisfactory industrial structure. In the course of these years, the most apparent feature of the Korean economy is the exportation of primary products and importation of manufacturing products. In this period, almost the whole exportation activity of Korea consisted of agricultural products and raw materials. (Sung, 1992:77).

Between 1953 and 1962, various economic policies were implemented in order to restructure the Korean economy, initiate rapid development and eliminate economic stagnation. Despite political instability and increasing inflation which appeared at that time, targeted economic policies were

applied. Syngman Rhee left his mark on the period between 1945 and 1961 by carrying out ultra-nationalist policies throughout his mandate. (Koo and Kim, 1992:123)

South Korea led its economic development in accordance with five year-development plans. The first of such plans came into effect in 1962. Initially, the State made common cause with private sector and gave particular importance to big private sector companies. In the beginning, development of big companies was facilitated in order to improve foreign trade and then, the attention was redirected to the development of small and medium enterprises within the framework of implemented policies. (Karabiber, 1997:2)

When Korea decided to prioritize exportation-oriented industrialization in 1960, companies which were supposed to do it adapted their organization to these new strategies under the conditions of that period. In addition to this, adequately trained, highly motivated and well-prepared workforce took its place in this rapid development, too. In 1960, the State tried to build its economic policies and choices on five principals. These principals included development of highly qualified workforce, stable and regular marcoeconomic policies, creation of efficient and secure financial markets, minimization of price fluctuations, development of agricultural sector and importation of foreign technologies. Intervening measures determined by the State for the success of economic policies include export promotion, control of financial markets, cause-related direct credits, discriminative and different supporting stimulus measures. Furthermore, the success of basic economic policies had depended on such different factors as protection of technicians and bureaucrats from political abuse by selection and employment of well-trained professionals, restructuring of the State organization, continuous follow-up of objectives predefined within the State's basic economic policies and industrialization strategy as well as timely and appropriate realization of corrections (TÜSİAD (Turkish Industrialists' and Businessmen's Association), *Görüş Dergisi* (Görüş Magazine), 1996: 32-36).

Years	Billion Korean Wons	Billion \$	Per Capita Income in \$	Growth Rate
1993	265,517	330	7,484	5.8
1994	303,772	378	8,467	8.6
1995	348,979	452	10,037	9.0
1996	386,640	480	10,548	6.9
1997	450,853	437	9,511	4.9
1998	443,127	316	6,823	-5.8

1999	483,800	406	8,581	10.7
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Table 1: General Economic Conditions (1993-1999)

Source: Turkish Embassy of Seoul, Trade Consultancy Office, <http://www.musavirlikler.gov.tr> Access Date, January 25, 2012)

Table 1 displays general economic conditions of South Korea between the years 1993-1999. While the growth rate in 1993 is 5.8%, it progressively increased and reached 9.0% in 1995. Even though a certain decrease can be observed in 1995, this rate climbed to 10.7% in 1999.

2. THE ROLE OF INNOVATION IN THE DEVELOPMENT OF SOUTH KOREA

South Korea can be seen as the most striking example in the subject of "keeping up with the state-of-the-art technology". Korea is one of the eight Asian countries which were indicated by the World Bank (1993) to experience a "miraculous" growth between 1965 and 1990 and particularly, the electronics industry had seen a major advancement within these 25 years.

R&D activities have been highly privileged in South Korea. 'They have built research centres, technology parks and zones where industry and technology come together since 1960' (Kozlu, 1995:29)

2.1. DEVELOPMENT PROCESS OF INNOVATION IN SOUTH KOREA

Innovation activities which have played an important role in the development of South Korea are analysed under 2 main categories as follows;

R&D Activities

Miraculous economic growth of South Korea and its superior ability in scientific and technological fields require even more developed and dynamic research and development activities because the rate of development and growth is very high since 1980. In 1980s, the government shifted its focus from industrial policies to technological policies. This shift resulted in a significant increase of R&D expenditure, particularly in the private sector. The share of private sector in total R&D expenditure increased from 32% in 1971 to 80% in 1987 (Hassink, 2001:8).

South Korea's investments in the field of technology increased twenty times from \$480 Million in 1980 to \$10 Billion in 2000 while at the same time, the rate of technological investment per domestic product increased from 0.84% to 2.68%. Even in the middle of foreign currency crises occurred in 1997-98 and successive economic crises, South Korea had achieved to increase its R&D investments to USD3.85 billion in 2002, in other words, from 3.6% to 4.7% of total government budget. The number of scientific and technological experts increased from 18,500 in 1980 to 160,000 in 2000 (South Korea Guide: 16)

Years	Research and development Expenditure (% of GDP)	High-technology exports (current billion US\$)	Researchers in R&D (per million people)	Technicians in R&D (per million people)
1996	2.42	27,416.00	2,209.32	635.47
1997	2.48	31,182.00	2,262.26	581.43
1998	2.34	30,645.00	2,022.51	534.23
1999	2.25	41,080.00	2,173.24	567.33
2000	2.30	53,950.00	2,334.09	456.65
2001	2.47	40,042.00	2,919.01	456.34
2002	2.40	46,600.00	3,022.83	499.02
2003	2.49	57,160.00	3,206.99	570.90
2004	2.68	75,742.00	3,298.11	585.35
2005	2.79	83,526.00	3,780.23	552.31
2006	3.01	92,944.00	4,186.86	586.94
2007	3.21	110,633.00	4,627.16	719.93

Table 2: R&D Indicators between 1996-2007

Source: The World Bank, <http://www.worldbank.org/>, Access Date: January 25, 2012)

As can be seen from Table 2, R&D expenditure/GDP rate of South Korea in 1996 was 2.42% while this rate reaches 3.21% in 2007. High technology exportation amounts to 27 billion Dollars in 1996 while this amount is 110 billion Dollars in 2007.

Private companies called "Chaebol" contributed to the South Korean economy at a large scale since they dominate the economy. Especially, 5 big Chaebols possessed the majority of Korean patents in 1990. Along with the positive influence of R&D on yield, big enterprises planned out a special management and tended to make expansions in this matter. In 2000, 4 big Chaebols, Samsung, LG, Hyundai and SK, spent 4,731 billion Korean Wons for R&D activities and this trend continued in 2001, as well. While private companies made a R&D expansion of 20% in 2000, this rate is only 9% in laboratories, institutes and universities controlled by the government (Luthria and Maskus: 144)

In 1997, South Korean private sector made the 77% of R&D expenditure of the country and this trend has persisted afterwards. High-end technology was the main subject of increasingly popular

R&D investments and a great deal of effort was put into attracting South Korean engineers working in American companies. Engineers who agreed to return have played a key role in the learning process and have had positive influences on the yield of research activities of Korean companies. On the other hand, Korean government contributed to these activities, too, by following an adequate policy (Luthria and Maskus: 145-146).

2.2.Scientific and Technological Activities:

South Korea is one of the OECD countries which allocate the largest share to R&D from GNP. But the role of government in the resources allocated to R&D is rather low. Accordingly, finance and performance are mostly under the control of private sector. It has been observed that universities put a lot of effort into R&D activities. The number of R&D employees within universities is at the same level as the European average. Korea takes the fifth position regarding total patent numbers with a global percentage of 5%. This great number of patents is mostly the contribution of Chaebols, notably Samsung. Patent percentages;

Samsung Electronics Co. Ltd. (40%)

Daewoo Electronics (9.7%)

LG Semiconductor Co. Ltd (7.2%)

LG Electronics Inc. (6.6%)

Hyundai Electronics Ind. Co. Ltd. (6.5%)

Patent numbers have the foregoing distribution within the country. (U.S. Patent and Trademark Office Report, 1998: 75).

The government founded in April 1999 the National Science and Technology Council (NSTC) in order to reinforce the coordination of national scientific and technological policies. The reasons of foundation of the NSTC include the recent decrease in the number of young people who choose to build a career on a science or technology-related subject in comparison with previous years as well as the increase of concern for yield due to high amount of investments in science and technology. Having the main objective to coordinate essential policies targeting scientific and technological advancement, to broaden investments in science and technology and to define the priorities of national R&D programmes, the NSTC targets at the same time to increase the yield of expansion-oriented R&D activities related to information technology, bioengineering, nanotechnology, environmental technology, cultural technology and space science. The NSTC is composed of 19 cabinet members working in the field of science and technology. The president chairs the council.

The government planned to establish a National Research Scholarship System in order to increase the motivation of scientists and engineers. Thus, researchers who dedicate themselves to their work will be rewarded with prizes of the president and will have access to the benefits of a pension fund thanks to research funds. In addition, the government actively tries to internationalize the R&D activities of South Korea in terms of the competition among global R&D networks and currents. As a result of this, Korea incrementally opened its R&D projects to foreign institutes in order to form a quality research environment for leading foreign investors and local scientists.

The government increased basic research investments budget from 19% in 2002 to 25% in 2006 and encouraged 400,000 experts in six nationally strategic fields in 2005 in order to support basic research activities and highly capable, creative researchers and scientists. These nationally strategic fields are information technology, bioengineering, nanotechnology and space science as well as environmental and cultural technologies. This has also permitted to take numerous steps towards the augmentation of women talents in technological development. Some measures taken with regard to this subject include women employment, a quota system and positive discrimination towards women concerning employment in scientific and technological fields. (Foreign Information Service of Korea, South Korea Guide: 16).

3.CONCLUSION

Innovation stands for the implementation of new methods and practices within cultural, social and administrative environments. Innovation can be achieved in all fields.

South Korea succeeded in accomplishing a striking development of innovation and attracting high levels of attention thanks to its economic development.

In 1980s, South Korea saw a rapid technological development in addition to a significant growth and advancement. Growth and advancement were attained as a result of innovative undertakings as well as the importance given to education, skills development, human resources and workforce. The secret to this success consists mostly of their R&D activities, the importance given to the technology, prioritization of innovation and acceleration of education and advancement. They have taken important steps in the path of competing with developed countries and experienced various change processes. The prominent factor of these change processes is the development of innovation and making a government policy out of it.

South Korea's investments in the field of technology and innovation increased twenty times from \$480 Million in 1980 to \$10 Billion in 2000 while at the same time, the rate of technological investment per domestic product increased from 0.84% to 2.68%.

In 1997, private sector raised its R&D expenditure and initiated investments in high-end technology. When engineers working in American companies agreed to return, they played a key role and contributed to the yield of Korean companies. Korean government contributed to this development by implementing adequate policies, too.

In conclusion, South Korea has built its development strategy upon innovation. And to that end, it followed other countries like the United States who achieved their development in a similar way. They have accomplished the learning and development processes thanks to innovation. Big private business enterprises called Chaebols have gained more and more importance in the economy, and the State and the private sector have acted in concert with regard to the development strategy. South Korea is now among those countries which have developed through innovation.

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