

## ПРОБЛЕМЫ РАЗВИТИЯ ВНЕШНЕЭКОНОМИЧЕСКИХ СВЯЗЕЙ И ПРИВЛЕЧЕНИЯ ИНОСТРАННЫХ ИНВЕСТИЦИЙ: РЕГИОНАЛЬНЫЙ АСПЕКТ

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## THE ROLE OF SCIENCE AND TECHNOLOGY POLICY FOR THE PROMOTION OF ECONOMIC GROWTH AND DEVELOPMENT IN SOUTH KOREA

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### Bong-Kyoungh Jeon, The role of science and technology policy for the promotion of economic growth and development in South Korea

Some policy analysts argue that governments are incapable of making effective or useful choices about which technologies to promote and support to foster economic growth and development. Others argue that many contemporary innovations were developed or came into widespread use as the result of specific government interventions. The article would argue for one of these viewpoints and explain a more useful guide to government policy making. Hence, this paper also investigates the factors of government policy that produced the “Korean miracle,” and how Korea’s policy differed from those of other developing countries. This paper consists of three parts: section one explains the background of the Korean government’s intervention in the domestic industry and market environment; section two investigates the difference between Korean state policy and the policies of other countries; and conclusions follow in section three.

**Keywords:** Science, technology and innovation policy; industrial policy; economic growth; reforms; South Korea.

#### Бонг-Кьёнг Джеон, Роль научно-технической политики для поддержки экономического роста и развития в Южной Корее

Одни эксперты утверждают, что государство не в состоянии принимать эффективные решения о том, в какие технологии нужно инвестировать для обеспечения экономического роста и развития. Другие утверждают, что многие современные инновации были разработаны или получили широкое распространение в результате конкретных мероприятий правительства. В статье анализируются факторы государственной политики, которые привели к “корейскому экономическому чуду”, и как политика Кореи отличалась от политики других развивающихся стран. Эта статья состоит из введения и трех частей: первый раздел объясняет институциональную среду для вмешательства корейского правительства в отечественную промышленность и рыночную среду; второй раздел исследует разницу между корейской государственной политикой и политикой других стран, после чего будут сделаны выводы в последнем разделе.

**Ключевые слова:** научно-технологическая и инновационная политика; промышленная политика; экономический рост; реформы; Южная Корея

#### Бонг-Кьёнг Джеон, Роль науково-технічної політики для підтримки економічного зростання та розвитку в Південній Кореї

Одни експерти стверджують, що держава не в змозі приймати ефективні рішення про те, в які технології потрібно інвестувати для забезпечення економічного зростання та розвитку. Інші стверджують, що багато сучасних інновацій було розроблено або отримали широке поширення в результаті конкретних заходів уряду. У статті аналізуються чинники державної політики, які призвели до «корейського економічного дива», і як політика Кореї відрізнялася від політики інших країн, що розвиваються. Ця стаття складається з вступу і трьох частин: перший розділ пояснює інституційне середовище для втручання корейського уряду у вітчизняну промисловість і ринкову середовище; другий розділ досліджує різницю між корейською державною політикою і політикою інших країн, після чого будуть зроблені висновки в останньому розділі.

**Ключові слова:** науково-технологічна та інноваційна політика; промислова політика; економічне зростання; реформи; Південна Корея.

### Introduction

Government policies on technology innovation have had a significant influence on perspectives on national economic growth over the last four decades. Appropriate policies have clearly contributed to improving economic growth and industrialisation (Radosevic, 2012). In particular, East Asian countries such as South Korea (henceforth referred to as Korea), Taiwan, and recently China have seen undisputed rapid economic growth through government intervention. This paper focuses on the case of Korea, exploring how the Korean government contributed to the promotion of economic growth and development through appropriate interventions in technological innovation.

The striking economic growth and industrial structure change of Korea over the past half century has made Korea the most dynamic country in the world in terms of the speed of industrialisation. Korea has successfully moved from labour intensive industries, such as textile manufacturing, to advanced technology products and capital-intensive industries, such as semiconductors. According to the World Bank (1988), between 1965 and 1986 the annual per capita Gross National Product (GNP) of Korea grew 6.7 percent, compared to 2.9 percent growth for other developing countries. The manufacturing growth rate in Korea between 1965 and 1980 was 18.7 percent, compared to 13.2 percent for Singapore, 9.6 percent for Brazil, 9.5 percent for China, 7.4 percent for Mexico, and 4.3 percent for India.

What is the difference between Korea and many other countries? Chang (1993) points out that Korea’s rapid growth was accompanied by major structural changes brought about by central decision-making.

On the other hand, Dornbusch and Park (1987) note: “The Korean strategy is much the same as that of the Latin American countries, with pervasive protection of an infant-industry kind going hand in hand with favourable treatment of the export sector through tax incentives and credits.” While, state policies of Latin America are similar in structure to Korea’s, the results of government intervention in technology policies are strikingly different. Hence, this paper also investigates the factors of government policy that produced the “Korean miracle,” and how Korea’s policy differed from those of other developing countries.

This paper consists of three parts: section two explains the background of the Korean government’s intervention in the domestic industry and market environment; section three investigates the difference between Korean state policy and the policies of other countries; and conclusions follow in section four.

#### Government interventions in the domestic industry and market environment

During Korea’s industrial development process, the Korean government strongly protected and promoted select infant industries through specific policies. Collins and Park (1988) explain that starting in the early 1960s the Korean government – which was under the military regime of Park Chung-Hee from 1962 to 1979 – attempted to foster export-oriented industrialisation.

In 1962 the Korean state initiated five-year economic development plans to switch from import substitution industrialisation to export-oriented growth, in order to encourage the domestic industry. The hallmarks of the industrial policy were extensive government intervention in both domestic and international capital markets (e.g., tariff systems, interest rate subsidies, exchange rates, etc.). These policies became vital to subsidising domestic industries and maintaining competitiveness in the global market.

Regarding trade protection policy, Korean tariff systems have been reformed several times. Lee (1996) argues: “The simple average of legal tariff rates rose during the period of import substitution and has declined gradually since the tariff reform of 1962, when Korea switched its trade regime.” Between 1952 and 1962, Korean tariff rates increased by more than 10 percent (from 25.4 percent to 39.9 percent); furthermore, from 1963

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to 1973, the Ministry of Finance imposed special customs tariffs from 70 to 90 percent for specific import commodities that were regarded as nonessential. The government actively intervened, imposing import restrictions in order to reduce balance of payments deficits and protect domestic industries (Kim 1988; Collins and Park 1989). The Korean state deeply intervened in the tax system in order to give preferential treatment to key industries and conglomerates (also referred to as chaebol diversified conglomerates that are usually controlled by one or two families). With the initiation of five-year plans the tax system has often been revised to provide incentives for reorganising and maintaining domestic industries. Industries that imported raw materials and capital equipment for export benefitted from drastic government measures, such as exemptions from tariffs. According to Kwack (1985), in the mid-1970s the Korean state significantly reformed its domestic tax schemes through a programme of "Special Treatment for Key Industries." The government provided for a tax holiday during the five years in the domestic industry (i.e., a full exemption during the first three years, and then a 50 percent exemption for the next two years). This incentive was offered to major heavy and chemical industries. However, in order to get the tax incentives or exemptions, many firms tended to indirectly deal (i.e., substantial rebates) with the state.

The Korean industrial structure became more advanced and complicated in the mid-1970s when industries were in conflict between import-substitution and the export-oriented sector, while consistently trying to protect infant industries. In addition, internally and externally the economic environment was poor, which coincided with a worldwide resurgence of inflation, a slowdown in export growth, and a deterioration of income. Hence, the Korean state (more specifically, the Korean president) established a task force to deal with inefficient firms following the massive investment boom in the late 1960s (Chang, 1993). For example, in the late 1960s and early 1970s, the government enforced mergers, sales, and liquidations of some inefficient firms. Furthermore, in the late 1970s the Korean state again rearranged the domestic industry, particularly the heavy and chemical industries. In the auto-mobile industry, one of the major car companies (Kia) was forced to specialise in trucks and buses (Kia was later integrated into the Hyundai auto-mobile company). Hyundai and Ssangyong – two major companies – were forced to split the market into two segments and specialise (Hyundai in over-6000 horsepower engines and Ssangyong in under-6000 horsepower engines). In the heavy electrical machinery industry, three companies (Hyosung, Ssangyong, and Kolon) were merged into one (Hyosung) and allowed to produce only highly specialised and expensive products. In addition, in 1984 the government merged over 60 ship-building companies into only 17 (Lee, 1985).

The Korean state appropriately invested in specific industries. For example, the semiconductor industry of Korea is a very interesting case study. The early stage of the semiconductor industry in Korea received offshore investments from American manufacturers in the early 1960s, because of the low labour cost advantage (Hobday, 1995). After half a century, Korea's semiconductor industry occupied the dominant market share in the world. How did the Korean government contribute to the striking growth of this industry?

Byun and Ahn (1989) argue that the fifth five year plan (beginning in 1982) included the semiconductor industry as one of the principal target industries, exempting it from tariffs on production equipment. Second, the Korean state coordinated Research and Development (R&D) efforts among private firms; the government and firms jointly set up R&D funds, and the research centres of private firms submitted research plans for new product development programmes. Through these processes, the Electronics and Telecommunication Research Institute (ETRI) approved proposals, which led to significant financial support from the joint fund. Finally, the government established many national science research centres to support advanced technology. For example, the South Korean Institute of Science and Technology (KIST) was set up as the first modern multi-disciplinary research organisation, supporting future promising technology development. The Ministry of Science and Technology (MOST) was also established as a central agency for policy-making, planning, coordinating and promoting of science and technology.

By the end of the 1970s, the Korean government had invested a lot of money in establishing new institutions and dispatching human resources to advanced countries to acquire knowledge. These policies were efforts towards industrialisation, and to satisfy science and technology demands. Regarding innovation policy, the government operates the Science and Technology Policy Institute (STePI), the Korea Institute of Science and Technology Evaluation and Planning (KISTEP), and the Korea Institute Science and Technology Information (KISTI). These three institutions carry out the state's core science and technology innovation research. In addition, all of these research centres were supported by various funds from the National Investment Fund, the Industrial Development Fund, the Korea Development Bank Technology Development Reserve Fund, and industrial technology promotion funds. Hence, the Korean semiconductor industry facilitated rapid growth.

### Korean state policy vs. policies of other countries

Korea's successful economic model is a case for ongoing study by many economists and policy-makers, particularly in developing countries. According to Balassa (1988), "the Korean state's role, apart from the promotion of shipbuilding and steel . . . has been to create a modern infrastructure, to provide a stable incentive system, and to ensure that government bureaucracy will help rather than hinder exports." This differs from Latin American countries, where there are pervasive controls of investment, prices, and imports, and decisions are generally made on a case-by-case basis, thereby creating uncertainty for business decisions. Why does the seemingly disastrous recipe of heavy-handed intervention work in Korea and not in other countries?

Indeed, the Korean government is not entirely different from those often associated with economic failures in developing countries, in that the industrial policy of Korea has created many inefficient firms. Nevertheless, "government has been willing to withdraw support whenever performance has lagged" (Amsden, 1989). The World Bank (1988) also reaffirms that "intervention was moderate in the sense that it did not lead to large price distortions." Another recent World Bank study, *Rethinking the East Asian Miracle* (Stiglitz and Yusuf, 2001), asserts that rapid growth in the East Asian economies has been associated with "market-friendly" interventions.

In the 1970s, the world economic environment also was favourable for Korea. After the oil shock, the Korean economic situation differed slightly from that of other East Asian developing countries (e.g., Taiwan, Singapore, and Hong Kong). These countries have the same trade structure as Korea, importing oil and commodities and exporting manufactures. Furthermore, compared to Latin American countries such as Brazil or Argentina, Korea's exposure to world economic influences was different. Brazil and Argentina are net commodity exporters, because of their abundant supply of raw materials. During the 1970s, oil prices moved up and commodity prices moved down following the oil shock. As a result, Latin American countries suffered more than Korea's. The late 1970s upturn of inflation in Korea was, in part, due to oil and necessary exchange depreciation. Unlike Latin America, Korea made a rapid fiscal and external adjustment even before the 1982 debt shock played itself out. Korea's ability to restrain wages may be as important here as the dampening of external shocks through its particular trade structure. Furthermore, many of Korea's heavy industries and building firms took advantage of construction projects in the Middle East, which were additional offsets to higher real oil prices and extra sources of foreign revenue.

In terms of government roles, there are slight differences between Korea and Taiwan. Scitovsky (1990) argues that even though both countries had similar economic development strategies, the "philosophies guiding the strategies" were different in some important ways. For instance, the biggest difference between the countries was their perspectives of the role of government. The efforts of the state to manage private enterprise was more considerable in Korea than in Taiwan. Taiwan implemented a variety of economic controls to create an "economic environment conducive to growth". Thus, the Taiwanese state tended to be "more selective and less intrusive" than in Korea (Smith, 2000). In contrast, the Korean state was more aggressively supportive of industry. As a result, Taiwan fostered the growth of small business firms, which were more flexible to adapt to changing economic conditions than large firms, and contributed to the entrepreneurial spirit, which encouraged competitiveness in the market. In addition, Taiwan's policy had the significant advantage of reducing income inequality. On the other hand, Korean state interventions entailed a more pervasive relationship between government and the private sector. This contributed to Korea's ability to occupy a large portion of the market share of specific industries through the creation of several conglomerates, which helped to grow Korea's economy and industry more quickly than other developing countries.

### Conclusion

This paper examines the impacts of government intervention in local industry. The Korean state adopted appropriate policies in terms of both market and industry (such as tariffs, financial support, and the integration of inefficient firms) (Lee, 1996). In particular, government intervention in industry policies such as tax incentives led to positive results in the competitive power of enterprise and expansion of local markets.

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The first step of government intervention was transformation of industry from import substitute industrialisation (inward-looking) to an export-oriented strategy (outward-looking) through centrally developed programmes (five year plans). At this stage, extensive policies supporting domestic industry contributed to the vitalisation of the private sector. Furthermore, alongside industrial growth, the economic situation of Korea also was radically improved. A realistic exchange rate, which was intended to generate profit in terms of export activities, was achieved by comparative advantage in labour-intensive industries. Increasing interest rates enabled the economy to invest more by mobilising savings (Chang, 1993). Policy-makers re-organised the industry map in Korea, integrating inefficient firms and ensuring that private firms had efficient structures in terms of competitions, productivity, and labour.

In my opinion, Korea's state intervention brought about successful economic growth and development. In contrast, the power of policy-makers caused rent-seeking, influence-peddling, and the diversion of entrepreneurial efforts away from productive activity. Furthermore, I would like to point out that the Confucianism culture of Korea was the most important factor about rapid growth. After Korean War, Korea was one of the poorest countries in the world. Policy-makers and citizens were eager to overcome poverty for the next generation. This was a very strong motivation among people to achieve higher education and to work long hours. Even though the old generation could not achieve higher education and did not have enough food, they were devoted to their children and supported education. As a result, Korean has recently come to achieve the highest education ranking by Organisation for Economic Cooperation and Development's (OECD) Programme for International Student Assessment (PISA). This means that Korean state and multinational firms sustain outstanding human resources. The competitiveness of an economy crucially depends on the quality and performance of its labour market. A well-organised labour market enables rapid and effective allocation of workers to their most efficient use at a minimum social and economic cost (Miyagiya, 1991).

Until recently, the government maintained pervasive trade restrictions and subsidies as well as control over the allocation of domestic and foreign credit. Korea shows clearly that government intervention can work well if done properly.

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### ДЕРЖАВНО-ПРИВАТНЕ ПАРТНЕРСТВО: СУТНІСТЬ, ЗАКОРДОННИЙ ДОСВІД, МЕХАНІЗМ РЕАЛІЗАЦІЇ В УКРАЇНІ

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Дмитриченко Л.І., Брайловський І.А. Державно-приватне партнерство: сутність, закордонний досвід, механізм реалізації в Україні.

У статті розглядається сутність економічної категорії «державно-приватне партнерство». На підґрунті аналізу історичних основ формування й розвитку системи відносин держави й приватного бізнесу, а також спираючись на публікації провідних дослідників даної проблеми, автори статті критично осмислюють існуючі підходи та формують власну позицію щодо сутності й механізму використання державно-приватного партнерства в Україні. Визначено загальнометодологічні підходи у дослідженні приватно-державного партнерства. Доведено нетотожність даної категорії з низкою категорій, що використовують як синоніми, а саме: з муніципально-приватним партнерством, приватно-суспільним партнерством, приватно-державною кооперацією, публічно-приватним партнерством, суспільно-приватним партнерством, партнерством держави і приватного сектору. Визначено умови мотивації приватного сектору до співпраці з державою й механізм її (співпраці) розвитку.

**Ключові слова:** державно-приватне партнерство (ДПП), державний сектор, приватний сектор, механізми розвитку ДПП, інституціональні основи ДПП, суспільство, потреби, інтереси.

Дмитриченко Л.І., Брайловський І.А. Государственно-частное партнёрство: сущность, зарубежный опыт, механизм реализации в Украине.

В статье рассматривается сущность экономической категории «государственно-частное партнёрство». На платформе анализа исторических основ формирования и развития системы отношений государства и частного бизнеса, а также опираясь на публикации ведущих исследователей данной проблемы, авторы статьи критически осмысливают существующие подходы и формулируют собственную позицию относительно сущности и механизма использования государственно-частного партнёрства в Украине. Определены общеметодологические подходы к исследованию государственно-частного партнёрства. Обоснована нетождественность данной категории с рядом категорий, используемых как синонимы, а именно: с муниципально-частным партнёрством, частно-общественным партнёрством,