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South Korea's Experience in the Development of National Innovation System

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ABSTRACT

Introduction. The Republic of Korea nowadays is a leader of innovative development not only in Southeast Asia, but also at the global level. Since 1950's thanks to the development of science, technology and innovation, one of the poorest agricultural countries has achieved unprecedented economic growth and became one of the leading advanced industrialised countries, which is popularly known as "Korea's economic miracle." One of the most important factors of rapid economic growth was the construction of an effective national innovation system (NIS). The purpose of the article is to analyze the main stages in the formation of the Korean national innovation system (NIS), to identify its strengths and weak points. **Methods**. The study used system analysis, structural-functional, historical and sociocultural approach. **Conclusions**. The Republic of Korea managed to construct an effective national innovation system thanks to the deduced state policy in the field of science and technology, competent strategic planning, a systematic and integrated approach to the development of innovation, large-scale and continuous R&D financing and the development of innovation infrastructure.

Keywords: national innovation system; innovation; Republic of Korea; techno-park; R&D; technology; scientific and technology policy; digitalization; information and communication technologies (ICT)

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South Korea has been called the "Miracle on the Hangang River" and one of the four "Asian Tigers", along with Hong Kong, Singapore and Taiwan. In 1996 the country joined the Organisation for Economic Co-operation and Development (OECD), whose members are advanced economies.

In July 1953, after the end of the three-year war, South Korea was a backward agricultural economy with a GDP per capita USD 87, low industrial potential, an underdeveloped domestic market and scarce natural resources. In 50 years, the Republic of Korea has become a global innovation leader (since 2013, it has topped Bloomberg Innovation Index for 6 years in a row) with a GDP per capita USD 50331 (2022).[1]

What factors were behind the "Korean economic miracle"? The experts suppose that the country's rapid economic growth is based on an effective innovation system, sound government policy, favourable global economic environment and a well-educated and disciplined population.

KEY STAGES IN THE FORMATION OF KOREA'S NATIONAL INNOVATION SYSTEM (NIS)

The first phase. 1960s.

From 1962 to 1979 Park Chung Hee (1917–1979) was president of the country and introduced significant economic reforms. Their goal was to transform Korea into an industrialised country with an export-oriented economy.

Thus in 1962 the Economic Planning Council was established, and the first five-year economic development plan was adopted, which implied support for import-substituting and export-oriented industries (footwear, clothing and textiles). During the period of light industry development (1962–1971), foreign investment totalled USD 2.6 billion, mainly in the form of loans to the government and the private sector. This stage laid the foundation for the country's industrial development. In the Second Five-Year Plan (1967–1972), six basic sectors of the national economy received legislative support: ferrous and non-ferrous metallurgy, petrochemicals, machine building, shipbuilding, and electronics [1, p. 127].

At that time, the Republic of Korea did not have sufficient financial resources to carry out its own R&D, so it acquired technology from industrialised countries and thus gradually increased its technological potential. The country's main strategic partner at that time was Japan, with which a treaty was concluded in 1965 that defined the basic principles of co-operation between the two countries. This partnership provided Korea with the Japanese technology and capital needed to develop its own economy. In exchange for military support in the Vietnam War, the United States also provided tens of billions of dollars in technology, subsidies, loans, and grants. Overall, between 1950 and 1960, U.S. aid played a fundamental role in the modernisation and industrialisation of South Korea.

In the early 1960s, R&D in the Republic of Korea was carried out only by the Korea Atomic Energy Research Institute and the National Institute of Military Technology. Annual R&D expenditures did not exceed 9.5 million USD, and there were only 5,000 engineers and scientists in the country [2]. The Korea Institute of Science and Technology (KIST), opened in 1966, was the first organisation dedicated exclusively to R&D.

To create a legal framework in this area, the Laws on Education and Support for Science and Technology were enacted in 1967. In the same year, the Ministry of Science and Technology (MOST) was established as the main government agency implementing the state science and technology policy.

An important role in the formation of the innovation system of the republic was played by the socio-cultural factor — features of the Korean national character, which were formed under the influence of Confucian-Buddhist ethics. Thus, the fundamental values in Korean culture are reverence for elders, discipline, devotion to family (clan), patriotism, loyalty, mutual assistance, and cooperation. Education and science are very important in the Confucian tradition, which was also a positive

[1] URL: https://data.oecd.org/gdp/gross-domestic-product-gdp.htm?context=OECD

factor in the formation of the Korean national innovation system (NIS). It is known that the advantage of the Republic of Korea over other developing countries was well-educated population: the level of education in the country in the 1960s was the same as in the countries whose wealth was estimated to be twice as high [3].

As a result, the foundations of the Korean NIS were laid during the first 5-year plan. President Park Chung Hee's economic policies aimed at attracting foreign investment and increasing exports played an important role in this context. State regulation of the economy increased (multiannual plans), important steps were taken towards industrialisation and the transfer of foreign technology was initiated.

During the Park Chung Hee administration, the state began to support the largest and most promising for the economy national companies in attracting investment. In 1962, the country's banks were nationalised, and the state gained full control over domestic lending. The result of the protectionist policy of the government was the active growth of chaebols (South Korean family-clan-type companies), which appeared at the end of the Korean War and now produce about half of the country's GDP. Thanks to the concentration of capital in their hands, the largest chaebols, such as Samsung (high-tech components, founded in 1938), LG (consumer electronics and home appliances, 1947), Hyundai (automobile manufacturing, 1967), Daewoo (electronics, home appliances, automobiles, weapons, 1967), have successfully developed strategically important industries for the country's economy.

The formation of chaebols was a reflection of the Korean character trait of corporatism and collectivism. Corporatism in this context is manifested in the fact that the management structure of the company is organised on the principle of a family clan. The head of the corporation is a kind of father. On the one hand, obedience to him is unconditional, on the other hand, he guarantees patronage to the employees and, like a father, cares about their well-being, providing them with social protection. Experts consider the high loyalty of corporate members to each other to be the main positive side of this system [4, p. 318].

Second phase. 1970s — early 1980s.

At this stage, the Korean national innovation system (NIS) has undergone significant changes. In 1971, the government established the nation's first national research and technology institute, the Korea Advanced Institute of Technology (KAIST), which became a leading teaching and research university. KAIST was initially staffed by U.S.-educated scientists and engineers and engaged in both fundamental and applied research. The institute also trained scientific and engineering personnel for national science and manufacturing. Today, KAIST is the main centre for strategic research projects in the country. In 1973, the Daedeok Science Town Research Complex was established in Daedeok district to bring together public and private research institutes, venture capital funds and high-tech firms. It was later expanded to Daedeok INNOPOLIS.

The following public research institutes were established in the 1970s to carry out R&D and support industries in technology development and utilisation: Korea Test Institute of Machinery and Metals, Korea Research Institute of Chemical Technology, Korea Electronics and Telecommunications Research Institute, Korea Research Institute of Standards and Science, Korea Ocean Research and Development Institute, and others. The establishment of a number of sectoral research institutes has contributed significantly to the improvement of Korea's national innovation system (NIS) [5].

To industrialise the economy, the Republic of Korea needed a large number of scientists and engineers capable of conducting its own R&D and introducing foreign technologies into production. To solve this problem, special programmes were developed at the Korea Institute of Science and Technology (KIST). In 1976, the Korea Science and Technology Foundation was established based on the experience of the USA and other industrialised countries in financing the training of high-class specialists.

An important milestone in the protection of intellectual property rights was the establishment of the Korea Industrial Property Protection Office

(1977), which was later renamed as the Korea Intellectual Property Office (KIPO).

Thus, at the second stage of formation of the national innovation system (NIS), the state began to provide significant support to the majority of capital-intensive industries, promoted the strengthening of technological potential, the creation of research institutes, the development of higher education and the training of R&D personnel. The national patent system was further developed, conditions were created for the return of scientific personnel to the country, the intensity of R&D increased, the role of science in production was strengthened, and the use of own technologies increased.

The third phase. 1980s.

In 1980, South Korea experienced an economic crisis. For the first time since 1962, the national economy showed negative growth and the balance of payments deteriorated. To remedy this situation, the government launched large-scale economic reforms.

Fundamental research and R&D received additional funding, including attracting foreign direct investment. At the same time, the country liberalised banking, customs control, as well as finance and trade regulations. The government also took measures to strengthen control over the activities of chaebols and began to exert less control over financial institutions and credit organisations. A number of state-owned banks were privatised with the state retaining the right to appoint executive directors and top managers [1, p. 131].

At this stage, the Korean government began to build a strategy for the country's scientific and technological development. In 1982, the First National R&D Programme was adopted.

In the 1980s, the structure of research funding continued to change towards an increasing share of the private sector. This was facilitated by significant tax incentives and other government support measures for private companies working in the field of high technologies.

Following American and Japanese experience, technoparks and technopolises were created to organise the transfer of technologies from science to production, which later became centres of technological development in the regions (Daejeon, Gwangju). Universities have also received additional opportunities for the transfer of developed technologies in the form of their own technology transfer centres and firms for the commercialisation of R&D results.

In order to train a sufficient number of highly skilled people for the innovation economy, the Korean government increased education spending up to 6.3 per cent of GDP in 1982 [5].

During this period, the government took measures to stimulate the development of priority high-tech industries (semiconductor manufacturing, ICT, radio electronics). One of the measures of state support for semiconductor production was the adoption of a programme of accelerated depreciation of equipment for 4–7 years and compensation of 50% of research and development costs in case of positive results in strategically important areas. The government's measures accelerated the development of these knowledge-intensive industries and made them one of the leaders of the Korean economy.

In 1985, a number of joint international scientific programmes were adopted, initiating long-term scientific and technological cooperation between the countries. Under these programmes, by 2000 the Republic of Korea was involved in about 1,500 projects with the United States, Japan, China, Germany, the United Kingdom and Russia. International co-operation and exchange of experience have given new impetus to the development of Korean science and technology [6].

At this stage Korean government began to build a long-term strategy of scientific and technological development of the country, fundamental research and applied R&D received additional funding and the technopolises and technoparks gave the impetus to the innovative development of regions.

Fourth phase. 1990s.

The fourth stage was characterised by the expansion of international trade relations and further globalisation. In the early 1990s, the Korean

government embarked on a course of deregulation and decentralisation of economic processes. Several ministries were restructured, and more than sixty state-owned enterprises were privatised to reduce the influence of large corporations on the economy.

During this period, the efficiency of R&D and production units of chaebols declined, and the restructuring of the innovation sphere followed the path of unbundling conglomerates. In order to improve the competitiveness of Korean chaebols in the global market, it was decided to encourage their specialisation in 3–5 priority sectors. At the same time, the government implemented measures to support small innovative enterprises.

One of the measures was a programme adopted in 1993 to bring together industrial enterprises, universities and research institutes for joint research and production activities. The programme also enabled small industrial enterprises to recover part of their R&D and technology implementation costs (50 per cent was reimbursed by the state and 25 per cent was reimbursed by the local authorities). Thanks to the measures taken, between 1993 and 2004, 5,026 patent applications were filed, 10,446 cases of process improvement and 13,600 cases of prototyping were recorded [7]. Since 1996, the science and technology sector has been using a project-oriented financing system instead of an estimated system, and the funds for research conducting have been distributed on a contractual basis. In 1997, the Korean government established the National Intellectual Property Agency (KIPO), modelled on the US patent system.

In the same year, the first five-year plan for the development of scientific and technological innovation for 1997–2002 was adopted. The document set the goal of reaching the scientific and technological level of the G7 countries by the beginning of the 21st century. The plan envisaged an increase in state investment in R&D (up to 5% of the total state budget), growth of state investment in fundamental research (up to 20% of the total state budget), training of qualified researchers (40 people per 10,000 population) [8]. Five-year planning, which has become one of the main principles of Korea's innovation policy, ensured the growth of exports of high-tech products, as well as an increase in the number of publications and patents.

At this stage, technology incubators and business incubators have played an important role in shaping Korea's innovation infrastructure. The first ones established in 1991 following the experience of Israel were state-owned incubators. The first private (Jungbu Industrial Consulting Inc.) and People's (Ansan Business Incubator) incubators were established in 1993. Since 1997, the country started to establish technoparks, and in 1998 the Korean Technopark Association was created with Daedeok being the main of the six incubators [9].

In 1998, the government transformed several dozens of national universities into research institutes, which began to specialise in fundamental research [10]. In the field of applied research, the importance of corporate laboratories increased. With more than 5 employees they could already receive state support. In general, by the mid-1990s, the number of researchers in the country had grown to a level close to that of developed European countries (29 researchers per 10,000 population).

In 1998, the KOSBIR (Korea Small Business Innovation Research) venture capital programme was introduced, under which government institutions and ministries were required to allocate at least 5% of R&D funding to small innovative enterprises. Under this programme, SMEs received preferential tax treatment and technical risk insurance.

In 1999 the government established the National Council for Science and Technology, whose main tasks were to coordinate government policy in the field of science and technology, establish priority research programmes and increase funding for scientific research. The Council was designed to improve the efficiency of R&D investment by prioritising the development of knowledge-intensive industries (such as nano- and biotechnology, information, aerospace, and environmental technologies) and to contribute to the preservation of the country's cultural heritage.

At this stage, state-funded research institutes were given the opportunity to work independently.

Special organisations were established to improve the efficiency of research and coordinate their activities. Eight research institutes were united by the Ministry of Science and Technology, and the Korea Institute of Science and Technology Evaluation and Planning (KISTEP) — became the main one.

Science in the Republic of Korea is supported primarily through government programmes. In particular, from 1999 to 2009, the programme "Research, design and experimental development at the turn of the 21st century" was implemented with a budget of USD 3.5 billion. The programme provided support for 25 major interdisciplinary projects in priority technological sectors.

In 1999 the Government of the Republic of Korea adopted the strategic initiative "Long-Term Science and Technology Vision 2025" (Vision 2025) which included three phases.[2]

The first one (up to 2005) was to make the most efficient use of available resources, improve the legal framework and develop infrastructure to make the Republic of Korea one of the 12 advanced scientific and technological powers and take a leading position among Asian countries.

In the second one (up to 2015), through intensive R&D development, Korea should have become the leader of the Asia-Pacific region in R&D and rank among the top 10 leading economies in the world.

The third one (up to 2025) was aimed at catching-up the level of scientific and technological development of the G7 countries.

In order to achieve these targets within the planned timeframe, the Korean government passed the Science and Technology Act in 1999 and began to implement the 21st Century Frontier Science Programme.

In 1960–1990, the scientific and technological development of the Republic of Korea was not based on foreign direct investment, but on the application of foreign technologies in industry: in electronics — American and German technologies, in automobile manufacturing — American and Japanese technologies, in shipbuilding — British technologies. The chosen strategy ensured the active development of these industries and increased the competitiveness of their products in the domestic and global markets.

Thus, by the beginning of the 21st century, the Republic of Korea had developed an effective innovation system that allowed local products to compete successfully in international markets. At this stage, the first five-year plan of scientific and technological innovation, the Science and Technology Act, the strategic document "Long-term forecast of science and technology development until 2025" were adopted; the National Council for Science and Technology and the National Intellectual Property Agency (KIPO) were established; a number of programmes for scientific and technological development of the country were implemented.

Fifth phase. From 2000 to the present

During the recovery of the Korean economy from the Asian financial crisis and the rise to power of President Kim Dae-jung (1998–2003), the development of science and technology had become of paramount importance to the country. Most attention had been paid to informatics, biotechnology, fundamental sciences, mechatronics and robotics, new energies, and new materials.

In 2001, the Korean government approved the first basic five-year plan for the development of science and technology, defining the goals and objectives of the country's scientific and technological development and measures to achieve them: increasing R&D funding, improving the infrastructure for research and technology commercialisation, upgrading the skills of R&D specialists, and creating regional innovation clusters. A framework law on science and technology was also adopted in 2001. Subsequently, similar basic plans were adopted by the government every five years thereafter.

Korea was expected to take the lead among Asian countries in the first phase of the "Long-term forecast" implementation. However, this result was not achieved, and Japan retained its leadership in

[2] Monitoring and analysis of policies and public financing instruments. Country Review Korea. European Commission. URL: https://ec.europa.eu/invest-in-research/pdf/download_en/korea.pdf

the region.[3] The goals of the second phase (up to 2015) were not fully implemented either. According to the Global Innovation Index 2016, Korea was the second most innovative country in the Asia-Pacific region, being second only to Singapore. It also failed to enter the list of world's top ten leading economies.

The Korean "economic miracle" was made possible largely due to the development of national science and technology based on large-scale and continuous R&D funding. Domestic R&D expenditure has increased steadily from 2.1% of GDP in 2000 and up to 4.9% of GDP in 2021.[4]

The effectiveness of Korea's national innovation system (NIS) is confirmed by its high position in various innovation development indices. According to the Bloomberg Innovation Index, the country confirmed its leadership among 95 countries in 2022. To calculate the index, seven key indicators are examined: R&D intensity, manufacturing, productivity, concentration of high-tech companies, efficiency of higher education, share of researchers in the total number of employees and patent activity. The Republic of Korea performed best in such categories as R&D and value added in manufacturing. The country ranked 18th in the world in terms of productivity and 20th in terms of patent activity. According to the Bloomberg index, Korea outperformed such countries as Germany, Finland, Switzerland, Israel, Singapore, Sweden, the United States, Japan and France in terms of the level of innovation development.

The Global Innovation Index ranked the country 6th in the world and 1st in the Southeast Asia region in 2022, overtaking Singapore.

The Republic of Korea is among the most advanced countries in the Information and Communication Technology Development Index. According to the ICT Development Index, it ranked 2nd in the world in 2017. Korea in the ranking is followed by Switzerland, Denmark, Great Britain, Hong Kong, the Netherlands, Norway, Luxembourg, Japan, Sweden and Germany. This index is calculated on the basis of indicators characterising access to the Internet, cellular communication, radio systems, tele-systems, IT infrastructure development, etc., and assesses the level of ICT use and practical knowledge among the population of countries [11].

According to a 2017 study, the digital sector's share of GDP in the Republic of Korea is the highest in the world (*Fig. 1*).

In the same year, Korea also recorded the world's largest share of ICT employment as a percentage of total employment in the economy (*Fig. 2*).

In April 2019, South Korea became the first Asian country to launch commercial 5G wireless network services, and in July Korea's SK Telecom announced the launch of the world's first 5G roaming service with Switzerland's largest mobile operator Swisscom.

The country has made significant progress in building a national innovation system (NIS) through strategic planning and a systematic and integrated approach to innovation development. The government's strategic vision of innovation can be traced back to the 1980s. Korea's current innovative development is largely due to the implementation of the concept of the "creative economy".

Creative industries are economic sectors based on collective and individual creativity, talent, and skill, which can create new jobs through the commercialisation of intellectual property. The Korean government's decision to switch to the concept of "creative economy" was influenced by the following factors: the country's almost complete lack of natural resources; increasing competition in the Asia-Pacific region (primarily with Chinese manufacturers); growing social tension due to the decreasing share of small and medium-sized businesses in the country's economy.

The state programme "Creative Economy" was adopted in late 2012 when President Park Geun-hye came to power. It focuses on supporting start-ups, the development of small and medium-sized innovative enterprises and innovation zones such as INNOPOLIS.

[3] The Global Technology Revolution 2020, In-Depth Analyses. The RAND Corporation. URL: http://www.rand.org/content/dam/rand/pubs/technical_reports/2006/RAND_TR 303.pdf

[4] URL: https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm

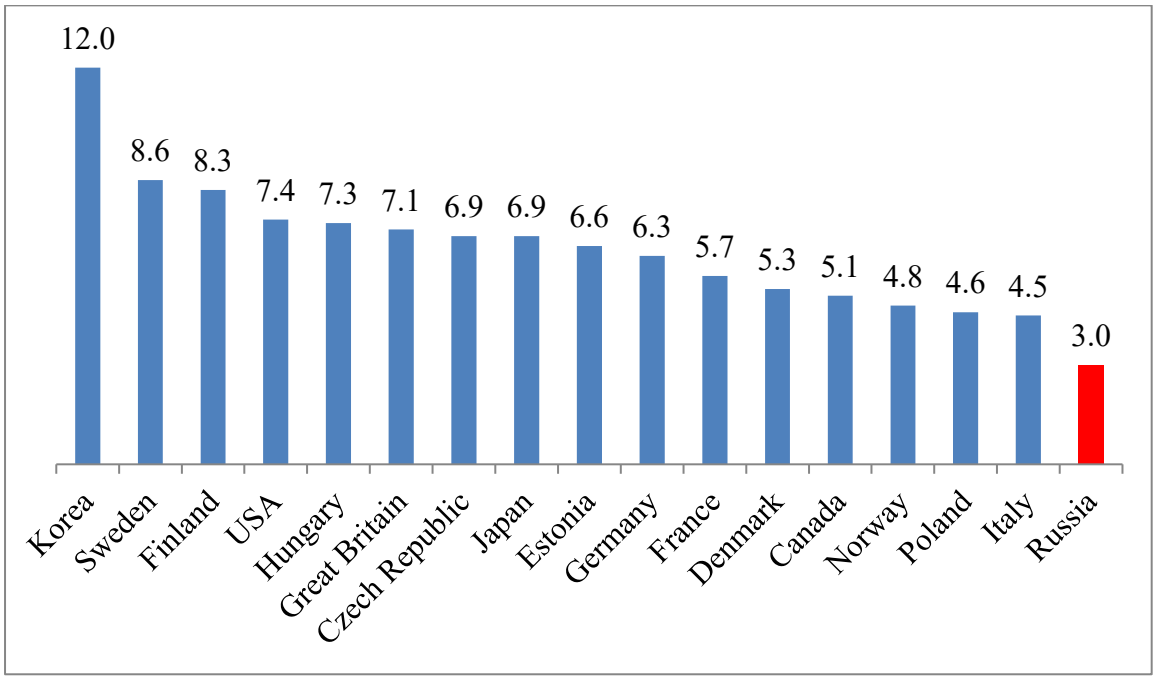

Fig. 1. **Digital economy contribution to GDP, % (2017)**

Source: compiled by the author.

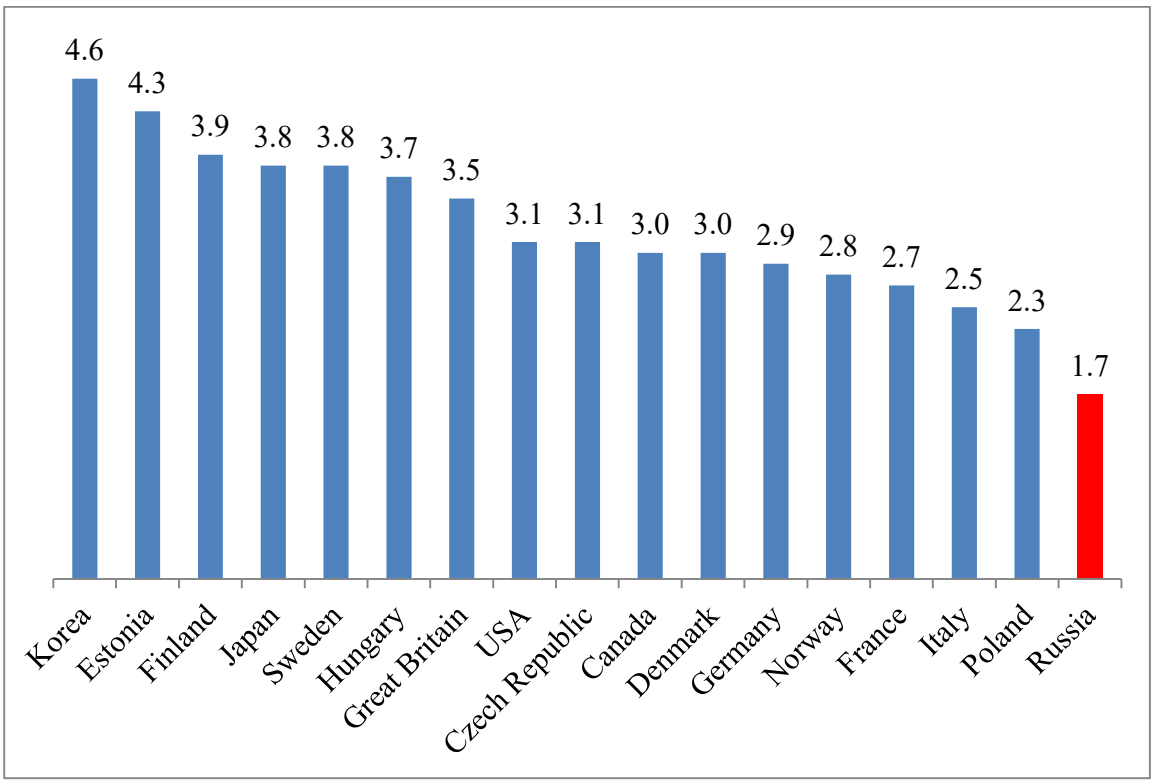

Fig. 2. **ICT employment indicator (2017)**

Source: compiled by the author based on OECD, ICT employment (indicator). URL: https://www.oecd-ilibrary.org/science-and-technology/ict-employment/indicator/english_0938c4a0-en

The Ministry of Science & ICT was established to implement the programme and in mid-2013 developed a programme implementation plan with three main goals, six strategies and twenty-four objectives.

The main objectives were:

- Creating new jobs and markets through innovation development (640,000 new jobs in the first 3 years);
- Establishing the Republic of Korea as a world leader in innovation, especially in telecommunications and the Internet of Things (IoT), by increasing R&D spending by 40 per cent from current levels;
- Creating a society that prioritises creative thinking over traditional conservative Korean thinking.[5]

Since 2013 the Korea Development Bank has been the main source of government funding for the creative economy.

Since the 2000s the national R&D strategy has gradually shifted from a strong government initiative to the creation of an innovation ecosystem based on public-private partnerships. For example, in 2005 the Daedeok Research and Development Complex was expanded to the Daedeok INNOPOLIS — special research and development zone, a regional innovation cluster linking research, technology commercialisation and industrial production. Daedeok INNOPOLIS is a world-class innovation cluster consisting of 26 government-funded research institutes, 7 universities, 1,700 companies and more than 30,000 research and development employees.[6] Similar regional centres have since been established following this model, and there are currently five INNOPOLIS centres (Daedeok, Gwangju, Daegu, Busan and Jeonbuk) in the country, which are brought together by the INNOPOLIS Foundation.

INNOPOLIS is the backbone of innovation growth and a key driver of economic development in South Korea. By fostering an innovation ecosystem, INNOPOLIS creates a consumer-oriented R&D environment, enables technology commercialisation and job creation, and supports the growth of SME technology start-ups to become the backbone of the country's innovative growth and industrial development.

INNOPOLIS Foundation has full membership in ASPA (Asian Science Parks Association) and IASP (International Association of Science Parks and Areas of Innovation). Based on a network of co-operation with science parks around the world, INNOPOLIS supports innovative companies to expand their business abroad.

An important indicator of innovation economy development is the share of expenditure on civil research and development (as a% of GDP). The Republic of Korea ranks 2nd in the world after Israel in this indicator (4.81% in 2021), 9th in the world in terms of the total number of research and development personnel (203 per 10,000 employed in the economy), and 3rd in terms of the number of researchers (166 per 10,000 employed in the economy).[7]

In a few decades, South Korea has made a transition from an agricultural economy with a low standard of living and high inflation to one of the leaders of innovative development. This has been possible largely due to effective government policy. The key factors of Korea's success that distinguish it from other rapidly developing countries have been effective management and a well-educated, motivated, and low-paid labour force compared to developed countries. Korean pupils and students are regularly ranked among the top performers in OECD PISA tests, and Korea outperforms other OECD countries in university education. Its investment in human capital has ensured that it has high efficiency and quality of innovations in use.

The socio-cultural factor has also played an important role in the country's economic success: the discipline, perseverance, and diligence of the Korean

[5] Strengthening the creative industries for development in the Republic of Korea. United Nations conference on trade and development. New York and Geneva, 2017. URL: https://unctad.org/system/files/official-document/ditcted2017d4_en.pdf

[6] URL: https://www.innopolis.or.kr

[7] Science Indicators: 2023. Statistical collection. National Research University "Higher School of Economics". MOSCOW: NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS; 2023.

people, based on the principles of Confucianism, which cultivates a conscientious attitude to work and respect for hierarchy [12]. At the same time, Korea is one of the world leaders in terms of investment in research and development, conducting continuous and large-scale financing of research and development. The development of human capital, science, technology, and innovation has allowed to build a national innovation system (NIS), which has become the main supporting factor of stable economic growth. The country did not capitalise on its abundant natural resources, but formed its competitive advantages at the expense of imported raw materials and energy, while competing on world markets with high-quality high-tech exports.

The analysis of the main stages of formation of the national innovation system in Korea shows that reliance on foreign technologies and effective government policy, which united the main actors of the national innovation system — the state, private business and scientific community — helped to achieve high rates of scientific and technological development in a relatively short period of time. South Korea's innovation model focuses on the development of innovation infrastructure. The government economic policy helps to ensure the country's receptivity to scientific and technological progress, and promotes coordination between different regions and sectors of the economy in the field of science and technology. [13].

Today the Korean economy has a number of industries that are highly internationally competitive: automotive, semiconductors, home appliances, telecommunications, metallurgy and chemicals. However, Korea lags far behind the developed countries in terms of total accumulated investment in science and technology. Since the 1970s, developed countries have invested an average of about 2% of GDP in research and development annually (according to OECD data[8]), while the Republic of Korea did not start investing in research and development on a large scale until the late 1990s. Thus, it is about 7 times behind the United States in terms of accumulated investment in science and technology.

There are still some weak points in South Korea's national innovation system (NIS) that hinder its successful development:

- The continued dominance of large firms (chaebols) in the R&D development despite government efforts to develop the innovation potential of small and medium-sized enterprises.
- Overemphasis on short-term industrial-oriented research to the detriment of long-term fundamental research.
- Relatively weak internationalisation of the national research system.
- Underdeveloped research potential of universities.
- Lagging productivity in the service sector compared to the manufacturing sector [14].

Thus, the potential of the national innovation system (NIS) of the Republic of Korea depends on the effective involvement of small and medium-sized enterprises in the innovation sphere, as well as encouraging the growth of start-ups. The country needs to enlarge its own fundamental research, reduce dependence on foreign technologies and increase budgetary funding for research and development (R&D).

[8] URL: https://data-explorer.oecd.org/

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