Challenges to the Export-Led Growth Strategy in the Digital and Global Era: An Empirical Investigation of South Korea’s Experience

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Abstract

This paper examines South Korea’s past developmental experience and its current strategy and policy initiatives to overcome global and domestic challenges and sustain economic growth in the twenty-first century, the digital and global era, to explain how the country became a high-income economy. The findings of this research highlight the following three factors: First, the most significant factor in rapid industrialization was the adoption of an outward-looking strategy, with the help of a highly skilled workforce and the development of high-tech manufacturing and services sectors, which was supported by the government plans. Second, the high R&D intensity helped South Korea become a global leader in information and communication technologies, which has emerged from a top-down innovation system that promotes close collaboration between government, industry, and the academic community. Third, according to the recently released Global Entrepreneurship Index, South Korea tops the region in entrepreneurship environment. Among the list of criteria, South Korea dominates in the ease of starting a business and enforcing contracts. They all play a significant role in encouraging investment, production, communication, and, eventually, economic growth. Finally, this paper suggests forward-looking developments promoting transformation and diversification into high-tech manufacturing and digital and green technologies.

Keywords: Economic Growth, Exports, R&D Expenditure, High-tech Manufacturing, Entrepreneurship

JEL Classification Code: E01, E22, E24, F16, F68

1. Introduction

1.1. Overview of Economic Forces of South Korea

South Korea has experienced one of the most significant economic transformations of the past 60 years. It started as an agriculture-based economy in the 1960s, and it became the 10th largest economy in the world in terms of gross domestic product (GDP) in 2020 (see Figure 1). The South Korean government’s policies resulted in real GDP growth averaging 5.45% annually between 1988 and 2019.

This strong performance was fueled by annual export growth averaging 9.27% in the same period. As the first former aid recipient to become a member of the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD) in 2009, South Korea’s gross national income (GNI) per capita increased rapidly from US$94 in the early 1960s to US$33,790 in 2019 (The World Bank, 2020).

In line with its enhanced international role, the Korean government increased its International Development Association (IDA) contributions, entered into a co-financing framework agreement with the World Bank, and created multiple trust funds. As a result, Phase 3 (FY22–24) of the WBG Korea Office Trust Fund was successfully negotiated with the Republic of Korea in December 2020. It was agreed that the WBG Korea Office would be a global center for innovation and technology for sustainable development. Through this global center, the WBG Korea Office will help developing countries adopt innovative and technology-enabled development solutions and support green growth innovations for sustainable development (The World Bank, 2022).
For 2021, the South Korean economy grew at 4.0%, helped by solid consumption expenditure combined with surging exports. Merchandise exports reached a record high of USD 645 billion in 2021, rising by 25.8% y/y. For the calendar year 2021, manufacturing output showed a strong rebound, growing at a 6.6% y/y (IHS Markit Inc., 2022). A key driver for the expansion in manufacturing output during 2021 has been the rebound in manufacturing exports. In addition, more robust economic growth in major economies such as the US, China, EU, and the UK linked to the rollout of vaccination programs during 2021 helped boost South Korean new export orders from its key export markets. As a result, the exports of goods and services in South Korea contributed an average of 45 percent of the total GDP between 2010 and 2020, while OECD members contributed an average of 27.5 percent of their GDP during the same period (The World Bank, 2022).

South Korea’s five most significant export products by value in 2021 were electronic integrated circuits, cars, refined petroleum oils, phone devices, including smartphones, and automobile parts or accessories (Workman, 2022a). Those major exports accounted for well over a third (36%) of South Korea’s overall exports. That percentage suggests a relatively full range of exported goods. The latest available country-specific data shows that 74.5% of products exported from South Korea were bought by importers in mainland China (25.3% of the global total), United States of America (14.9%), Vietnam (8.8%), Hong Kong (5.8%), Japan (4.7%), Taiwan (3.8%), India (2.4%), Singapore (2.2%), Mexico (1.8%), Germany (1.7%), Malaysia (1.6%) and Russia (1.5%) (Workman, 2022b). From a continental perspective, under two-thirds (63.1%) of South Korea’s exports by value in 2021 were delivered to fellow Asian countries, while 17.8% were sold to North American importers. South Korea shipped another 12.8% worth of goods to Europe. Smaller percentages went to Oceania (2.4%) led by Australia and the Marshall Islands, Latin America (2.1%) excluding Mexico but including the Caribbean, then Africa (1.9%) (see Figure 2).

However, supply chain disruptions in the manufacturing sector continued to obstruct a more robust recovery in activity and demand. Material shortages and rising input costs were exacerbated by delays in sourcing and receiving inputs, though there were indications that these pressures were starting to ease.

1.2. The Five-Year Economic and Social Development Plans

Table 1 describes as follows:

1) The plans were designed to increase wealth within South Korea and strengthen political stability. A change in policy from import substitution industrialization to export-oriented growth occurred throughout these five-year plans. In 1961, General Park Chung-Hee seized political power and decided...
Table 1: The Five-Year Economic and Social Development Plans of South Korea

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<thead>
<tr>
<th>5-Year Plan</th>
<th>Objectives</th>
<th>GDP per Capita</th>
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<td></td>
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<td>US$133 in 1966</td>
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<td>US$834 in 1976</td>
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<td>US$1,883 in 1981</td>
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<td>US$2,834 in 1986</td>
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<td>US$7,636 in 1991</td>
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<td>1993–1997</td>
<td>Internationalization Policy, called “Segyehwa” (8)</td>
<td>US$8,885 in 1993</td>
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<td>US$12,398 in 1997</td>
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<tr>
<td>Kim Dae-Jung</td>
<td>Cyber Infrastructure Building (10)</td>
<td>US$13,165 in 2002</td>
</tr>
<tr>
<td>Roh Moo-Hyun</td>
<td></td>
<td>US$24,068 in 2007</td>
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<tr>
<td>Lee Myung-Bak</td>
<td></td>
<td>US$25,466 in 2012</td>
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<tr>
<td>Moon Jae-In</td>
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<td>US$31,902 in 2021</td>
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Figure 2: Merchandise Exports Region-Specific, from South Korea
Data Source: World Development Indicators, The World Bank, 2022
the country should become self-reliant by utilizing these five-year plans.

2) Recognizing South Korea’s limitations concerning natural resources, the First Five-Year Plan (1962–1966) was geared toward developing a self-reliant industrial structure and infrastructure to establish a solid foundation, agricultural productivity, export, and technological advancements. These policies were established, along with further investments in education and other social resources, to shift the South Korean economy further towards an export-oriented one. As part of these shifts, the share of workers in agriculture steadily declined in exchange for more workers in manufacturing. During this period, South Korea faced a shortage of electricity. Therefore, the emphasis was on developing hydroelectric and thermal power capacity for the expansion of industrial production. The Korea Electric Power Corporation formation was initially related to the First Five-Year Plan.

3) The Second Five-Year Plan (1967–1971) aimed to modernize the industrial structure and build import substitution industries. The Second Five-Year Plan shifted the South Korean economy into a heavy industry by making South Korea more competitive in the world market, which was incorporated into all future five-year plans. The industry was based on the steel and petrochemical industry. In addition, the major highways were built for more accessible transportation.

4) The Third Five-Year Plan (1972–1976) sought to build an export-oriented industrial structure by promoting a heavy industry and a chemical one. As a result, the South Korean government implemented the Third Five-Year Plan, referred to as the Heavy Chemical Industrialization Plan (HCI Plan) and the “Big Push.” The HCI Plan designated five separate fields as strategic fields: Electronics, Shipbuilding, Machinery, Petrochemicals, and Non-ferrous metals. To fund the HCI Plan, the government borrowed heavily from foreign countries (not foreign direct investment so that it could direct its project).

5) The Fourth Five-Year Plan (1977–1981) promoted the development of industries that could effectively compete internationally in industrial export markets. As a result, South Korean exports began to grow enormously during these five years. However, in 1978, previously unaddressed problems began to arise because of the price of goods, real estate speculation, lack of everyday necessities, and various products. In addition, in 1979, the second oil shock pushed the South Korean economy to harsher standards, and unmet goals contributed to a first minus in the South Korean economy in years.

6) The Fifth Five-Year Plan (1982–1986) tried to move concentration to technology-intensive industries. The fifth plan shifted the emphasis away from heavy and chemical industries to technology-intensive industries, such as precision machinery, electronics (televisions, videocassette recorders, and semiconductor-related products), and information. In addition, more attention was devoted to building high-technology products in greater demand on the world market.

7) The Sixth Five-Year Plan (1987–1991) emphasized research and development (R&D) and the nurturing of human resources. The sixth plan is part II of the previous plan, to a large extent, continued to emphasize the goals. The South Korean government intended to accelerate import liberalization and remove various restrictions and non-tariff barriers on imports. These moves were designed to mitigate adverse effects, such as monetary expansion and delays in industrial structural adjustment, which can arise because of a large surplus of funds. The South Korean government pledged to continue phasing out direct assistance to specific industries instead of expanding workforce training and R&D in all industries, especially the small and medium-sized firms that had previously received much government attention. The South Korean government hoped to accelerate the development of science and technology by raising the ratio of R&D investment from 2.4 percent of the GNP to over 3 percent by 1991.

8) President Park Chung-Hee motivated the people of the nation. South Korea was a dirt-poor country, and the people were in despair. After the Korean War (1950–1953), the rest of the 1950s were more a matter of survival than development. President Park appealed to the nation, emphasizing that they could live a better life and inspiring them to aspire for more. Furthermore, to inspire the people, the president fostered in them a can-do attitude. Accordingly, a hard work ethic was firmly established. Against this backdrop, in the early 1970s, the South Korean government launched the “Saemaul” (New Village) Movement to overcome the gap between urban and rural areas. The Movement emphasized self-help, diligence, and cooperation and successfully transformed rural areas. Initially targeted toward underdeveloped rural areas, the Movement soon brought advances in various aspects of life throughout the nation. Now this formula has been exported to several developing countries. That said, critical success factors of the Korean economy from 1962–1991 and the last 30 years can be summarized as follows:
First, the South Korean government was very competent, dedicated, and goal-oriented in the age of development administration. Accordingly, the government played a leading role in the country’s efforts toward economic development.

Second, the South Korean people themselves. No development is possible without a pool of educated human resources. Good plans need to be carried out by competent people. Almost every family in South Korea places a high value on their children’s education. This thirst for knowledge resulted in a skilled workforce in different professions.

9) The Seventh Five-Year Plan (1992–1996) was developed to promote high-technology fields. The plan has been interconnected, with each building upon the achievements of the previous plans to move further forward. The goal of the seventh plan, formulated in 1989, was to develop high-technology fields, such as microelectronics, new materials, fine chemicals, bioengineering, optics, and aerospace. In addition, the South Korean government and industry worked together to build high-technology facilities in seven provincial cities better to balance the geographic distribution of industry throughout the nation.

10) The South Korean government attempted to reform the government and the economy of the nation. One of the government’s first acts was to start an anti-corruption campaign, which was an attempt to reform the “Chaebols” (conglomerates in Korea, the giant South Korean conglomerates), which dominated the economy. In addition to curbing the corrupt practices of the chaebols, the government encouraged them to become leaner and more competitive to succeed in the global economy, in contrast to the state-directed economic growth model of the preceding decades. Chaebols were criticized at that time for inefficiency and a lack of specialization. The South Korean government released the “100-Day Plan for the New Economy” for immediate economic reform, intended to decrease inflation and eliminate corporate corruption. Another Five-Year Plan was also implemented to encourage foreign investment as part of the internationalization strategy.

11) The South Korean government implemented the most neoliberal policy among the nation’s presidents. The first task of the government was restoring investor confidence. The government held a series of intensive meetings with foreign creditors and quickly succeeded in rescheduling one-quarter of South Korea’s short-term liabilities. In addition, the government vigorously pushed economic reform and restructuring recommended by the International Monetary Fund (IMF), significantly altering the landscape of the South Korean economy. With the government’s commitment to introduce internationally accepted accounting practices, including independent external audits, full disclosure, and consolidated statements by conglomerates, the government helped improve the transparency of corporate balance sheets and governance and bring the economy to greater integration with the global economy. The government also adopted a proactive foreign investment policy. Foreign direct investment was viewed as vital to the financial and corporate reform process as a form of secure, stable, and long-term investment and able to acquire new technologies and managerial practices.

12) The South Korean government built up nationwide high-speed information and communications technology (ICT) infrastructure and fostered IT and venture businesses as the future source of growth. The government expressed a vision for South Korea to advance from industrial societies into the ranks of the knowledge and information-based societies, where intangible knowledge and information will be the driving power for economic development. Today, South Korea is one of the most technologically developed countries globally and has a well-connected cyberinfrastructure.

13) The value of the South Korean won against the US dollar was the strongest during this administration since 1997. As a result, South Korea became the world’s tenth-largest economy for the first time in history, surpassing the $20,000 threshold in nominal GDP per capita, thanks to its strong currency. Policy goals for the government included the establishment of the nation as a business hub in Northeast Asia, the expansion of social welfare, the pursuit of balanced national development to help underdeveloped areas, the eradication of corruption, and the reform of labor-management relations. Although exports performed at record levels and the economy grew, growth still lagged behind the previous administration and the rest of the world, while the domestic economy stagnated.

14) The main objective of the government was cited in 2011 as “the foundation of micro-government and macro-market ideas to revive the economy” (The Hankyoreh Newspaper, 2007). The government ratified the South Korea-United States Free Trade Agreement bill on 22 November 2011. In addition, the government emphasized the growth of the South Korean military arms industry. The industry revealed plans to increase arms exports to US$4 billion yearly by 2020, making it the world’s 7th largest exporter. In 2010 and 2011, South Korea exported trainer jets and submarines to Indonesia.
15) The South Korean government announced a plan to build a “Creative Economy” on 5 June 2013, representing a vision for economic revival and job creation.

16) The First Industrial Revolution used water and steam power to mechanize production. The Second used electric power to create mass production. The Third used electronics and information technology to automate production. Now the Fourth Industrial Revolution is building on the Third, the digital revolution occurring since the middle of the last century. It is characterized by a fusion of technologies that blurs the lines between the physical, digital, and biological spheres. The possibilities of billions of people connected by mobile devices, with unprecedented processing power, storage capacity, and access to knowledge, are unlimited. The South Korean government intends to strengthen the competitiveness of the convergence industry as a new growth engine to create a sustainable future. Also, it is carrying out various projects in future strategic industry areas, including ICT convergence, offshore and shipbuilding, bio, robots, and the green energy industry.

1.3. External Shocks and Crisis During the Five-Year Plans

Table 2 describes as follows:

1) The South Korean government switched to an export-oriented outward strategy from an import-substitution one in January 1964 since it was challenging to secure loans from abroad. To earn hard currency, the government decided to manufacture and sell abroad. The nation had no natural resources to speak of, so there was no other choice but to export manufactured products.

2) The global economic boom in the 1960s and 1970s helped facilitate exports from the economy. One of the decisive decisions was to develop heavy industry and a chemical sector, which was announced in January 1973. South Korea started by boosting a labor-intensive light industry. That was easy to start, thanks to the country’s large and cheap workforce, but it was not enough to propel the economy’s emergence as one of the world’s leading economies. So the government turned to heavy industries such as steel, chemicals, automobiles, and ships to break through these limitations. In 1976, cars were exported for the first time in history.

3) The 1973 oil crisis began in October 1973, when the members of the Organization of Arab Petroleum Exporting Countries (OPEC), led by Saudi Arabia, proclaimed an oil embargo. The embargo was targeted at nations that had supported Israel during the Yom Kippur War. The initial nations targeted were Canada, Japan, the Netherlands, the United Kingdom, and the United States, with the embargo also later extended to Portugal, Rhodesia, and South Africa. A construction boom in the Middle East helped it tide through the first oil crisis. Another change caused by the oil shock of 1973 was a shift

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<tr>
<th>5-Year Plan</th>
<th>External Shocks and Opportunities</th>
<th>Trade-Related Events</th>
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<tbody>
<tr>
<td>1962–1966</td>
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<td>The Export-Oriented Outward Strategy in 1964&lt;sup&gt;1&lt;/sup&gt;</td>
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<td>1972–1976</td>
<td>Oil Crisis in 1973&lt;sup&gt;3&lt;/sup&gt;</td>
<td>U.S.-China’s Opening Up in 1972&lt;sup&gt;4&lt;/sup&gt;</td>
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<td>IMF Crisis in 1997&lt;sup&gt;7&lt;/sup&gt;</td>
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<td>1998–2002</td>
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<td>2003–2007</td>
<td>Oil Price Shock in 2008&lt;sup&gt;8&lt;/sup&gt;</td>
<td>FTA with the United States in 2007&lt;sup&gt;9&lt;/sup&gt;</td>
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<td>2008–2012</td>
<td>Global Financial Crisis in 2008&lt;sup&gt;10&lt;/sup&gt;</td>
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<td>2013–2016</td>
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<td>FTA with Australia in 2014&lt;sup&gt;11&lt;/sup&gt;</td>
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<td>2017–2021</td>
<td>COVID-19 Recession in 2020&lt;sup&gt;12&lt;/sup&gt;</td>
<td>Energy Crisis in 2022&lt;sup&gt;13&lt;/sup&gt;</td>
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<sup>1</sup> The Export-Oriented Outward Strategy in 1964
<sup>2</sup> Global Economic Boom 1960s–1970s
<sup>3</sup> Oil Crisis in 1973
<sup>4</sup> U.S.-China’s Opening Up in 1972
<sup>5</sup> The Summer Olympics in Seoul 1988
<sup>6</sup> Asian Financial Crisis in 1997
<sup>7</sup> IMF Crisis in 1997
<sup>8</sup> Oil Price Shock in 2008
<sup>9</sup> FTA with the United States in 2007
<sup>10</sup> Global Financial Crisis in 2008
<sup>11</sup> FTA with Australia in 2014
<sup>12</sup> COVID-19 Recession in 2020
<sup>13</sup> Energy Crisis in 2022
to nuclear power plants. In 1978, the first nuclear power plant was completed, and South Korea became the 21st country to use nuclear energy for electricity generation.

4) US-China’s opening up in 1972 led to a more significant competitive marketplace for South Korean goods and services.

5) Building upon the economy’s achievements, South Korea hosted the Asian Games in 1986 and the Summer Olympics in 1988. The hosting of the Olympic Games had a significant impact on the economy, firmly placing it on the global stage and further inspiring a sense of national pride. South Korea further harnessed its can-do spirit for a new leap forward.

6) The 1997–98 Asian financial crisis began in Thailand and quickly spread to neighboring economies. It began as a currency crisis when Bangkok unpegged the Thai baht from the U.S. dollar, setting off a series of currency devaluations and massive capital flights. As the crisis spread, most of Southeast Asia, South Korea, and Japan later saw slumping currencies, devaluing stock markets and other asset prices, and a precipitous rise in private debt. South Korea, Indonesia, and Thailand were most affected by the crisis. There was haste to build great conglomerates to compete on the world stage. However, many businesses ultimately failed to ensure returns and profitability. The chaebol, South Korean conglomerates, absorbed more and more capital investment. Eventually, excess debt led to major failures and takeovers. Among other stimuli, the crisis resulted in the bankruptcy of major Korean companies, provoking corporations and government officials toward corruption. The domino effect of collapsing large South Korean companies drove interest rates and international investors away. On 3 December 1997, the International Monetary Fund (IMF) agreed to provide US$58.4 billion as a bailout package. In return, South Korea was required to take restructuring measures.

8) Oil prices fell from a high of US$133.88 in June 2008 to a low of US$39.09 in February 2009. Over the same period, natural gas prices fell from US$12.69 to US$4.52. The lower cost of oil and gas due to the financial crisis impacted the sector.

9) The South Korean government concluded a free trade agreement (FTA) with the United States in April 2007. Despite domestic opposition from the traditional leftist constituency and various groups (mainly farmers) opposed to market opening, the government successfully pushed for the FTA.

10) The 2008 global financial crisis was a severe worldwide economic crisis. It was the most severe financial crisis since the Great Depression in 1929. Predatory lending targeting low-income homebuyers, excessive risk-taking by global financial institutions, and the bursting of the United States housing bubble culminated in a perfect storm. The crisis caused the Great Recession, which resulted in higher unemployment, decreased institutional trust, and reduced fertility, among other metrics. The economic crisis started in the U.S. but spread to the rest of the world. The recession was a significant precondition for the European debt crisis.

11) On 8 April 2014, the South Korean government signed the Australia–Korea Free Trade Agreement.

12) The COVID-19 recession was a global economic recession caused by the COVID-19 pandemic. The recession began in most countries around February 2020. After a global economic slowdown in 2019 that saw a stagnation of economic growth and consumer activity, the COVID-19 lockdowns and other precautions taken in early 2020 drove the global economy into crisis. Within seven months, many advanced economies had fallen into recession. The first sign of recession was the 2020 stock market crash, which saw significant indices drop 20 to 30% in late February and March. Recovery began in early April 2020; as of April 2022, the GDP for most major economies has either returned to or exceeded pre-pandemic levels, and many market indices recovered or set new records by late 2020. The recession saw unusually high and rapid increases in unemployment in many countries.

13) A global surge in demand drove the 2021–2022 global energy crisis. The world exited the early
recession caused by the pandemic, mainly due to strong energy demand in Asia. This crisis was then further exacerbated by the reaction to escalations of the Russia-Ukraine War. The Russia–Ukraine war in February 2022 is intensifying an energy shock that began unfolding as the prices for oil, natural gas, and coal started to recover from a COVID-19-induced slump. Alarm bells are ringing as inflation rates rise, currencies weaken, and debt service grows in energy-importing and developing countries. Consequently, many developing countries find it harder to pay for their energy imports. Nevertheless, not all developing countries are losers - oil exporters such as Angola and Nigeria and coal exporters like Colombia and South Africa are seeing higher earnings.

2. Data and Methodology

2.1. Data Source

This study obtains raw data for the World Development Indicators (WDI), the primary World Bank collection of development indicators - a compilation of comparable cross-country data on development - compiled from officially recognized international sources. It presents the most current and accurate global development data available and includes national, regional, and global estimates. It is a compilation of relevant, high-quality, and internationally comparable statistics about global development and the fight against poverty (The World Bank, 2022).

2.2. World Development Indicators

This study compares some selected indicators as follows:

**GDP per capita (current US$)**

GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without deductions for depreciation of fabricated assets or depletion and degradation of natural resources. Data is in current U.S. dollars.

**Exports of goods and services (% of GDP)**

Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments.

**Market capitalization of listed domestic companies (% of GDP)**

Market capitalization (also known as market value) is the share price times the number of shares outstanding (including their several classes) for listed domestic companies. Investment funds, unit trusts, and companies whose only business goal is to hold shares of other listed companies are excluded. Data is end-of-year values.

**Stocks Traded, Total Value (% of GDP)**

The value of shares traded is the total number of shares traded, domestic and foreign, multiplied by their respective matching prices. Figures are single counted (only one side of the transaction is considered). Companies admitted to listing and admitted to trading are included in the data. Data is end-of-year values.

**Research and development expenditure (% of GDP)**

Gross domestic expenditures on research and development (R&D), are expressed as a percent of GDP. They include both capital and current expenditures in the four main sectors: Business enterprise, Government, Higher education, and Private non-profit. R&D covers basic research, applied research, and experimental development.

**High-technology exports (% of manufactured exports)**

High-technology exports are products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery.

3. Data Analysis and Findings


What is an export-led growth strategy? Export-led growth occurs when a country seeks economic development by engaging in international trade. The export-led growth paradigm replaced the import substitution industrialization paradigm. However, this strategy is what many interpreted as a failing development strategy. While an export-led development strategy met with relative success in Germany, Japan, and East and Southeast Asia, current conditions suggest that a new development paradigm is needed. Export-led growth has a lot to do with self-sufficiency. It is an effort by countries to become self-sufficient and lower their dependence on developed nations. They do this by developing their industries to compete with other countries that rely on exports.

For South Korea, the most significant factor in rapid industrialization was adopting an outward-looking strategy in the early 1960s, supported by the Five-Year Economic and Social Development Plans of South Korea in 1961. Because of South Korea’s low savings rate and small domestic market, this strategy was particularly well-suited at the time. Many
studies attribute South Korea’s structural transformation to policy reforms to open the country to foreign markets. Indeed, the export-oriented policies of South Korea are one of the essential factors of its success. South Korea is now one of the top 10 exporters globally, and its exports as a percentage of GDP increased from 3.9 percent in 1962, 25.7 percent in 1995, to 41.7 percent in 2019 (see Figures 3 and 4).

The period between 1970 to 1985 saw the adoption of the export-led growth paradigm by the Four Asian Tigers (i.e., South Korea, Hong Kong, Singapore, and Taiwan), which led to their subsequent economic success (Johnston, 2022).

![Figure 3: Exports of Goods and Services Between 1970–2020](Data Source: World Development Indicators, The World Bank, 2022)

![Figure 4: Manufactures Exports by Value-Added in the Manufacturing Sector in South Korea](Data Source: World Development Indicators, The World Bank, 2022)
While an undervalued exchange rate made exports more competitive, these countries realized a much greater need for foreign technology acquisition if they wanted to compete in the auto manufacturing and electronics industries. Compared to their competitors, much of their success has been attributed to their acquisition of foreign technology and its implementation. The ability of these countries to acquire and develop technology was also supported by foreign direct investment (FDI) (Sarel, 1996).

Some newly industrializing nations in Southeast Asia followed their example, as did several countries in Latin America. However, this new wave of export-led growth is perhaps best epitomized by Mexico’s experience that began with trade liberalization in 1986 and later led to the inauguration of the North American Free Trade Agreement (NAFTA) in 1994.

3.2. R&D Investment: Investing in the Future

South Korea has devoted extra attention to technology development and innovation to promote growth. As a result, innovation and technology are the key factors that have underpinned South Korean export competitiveness and fueled the country’s remarkable economic rise over the past decades. South Korea holds the number one spot in the recently released 2016 Bloomberg Innovation Index (Bloomberg News, 2016), which scores economies using factors including R&D spending and the concentration of high-tech public companies. South Korea notched top scores worldwide for manufacturing value-added, as well as for tertiary efficiency. This measure includes enrollment in higher education and the concentration of science and engineering graduates. In addition, it was ranked second for R&D intensity, high-tech density, and patent activity and sixth for researcher concentration.

South Korea’s position as one of the world’s most innovative nations is a remarkable achievement (Nature Index, 2019). It is second only to Germany in the 2020 Bloomberg Innovation Index, having reigned at the top of the 60-country list for the previous five years. In the separate 2019 Global Innovation Index, published by Cornell University, INSEAD, and the World Intellectual Property Organization, South Korea is at number 11, and Germany is in ninth place among the 129 countries ranked (Nature Index, 2020). Both indices highlight South Korea’s outstanding performance in R&D intensity, an indicator based on R&D investment by government and industry and the number of researchers working in and between both sectors.

South Korea is now spending the largest share of its GDP on R&D, even more extensive than the U.S. and Germany, two of the global innovation leaders based on R&D intensity. Between 1996 and 2019, South Korea’s R&D intensity grew 104 percent (from 2.22% in 1996 to 4.53% in 2019), while OECD members only grew 15 percent (from 2.21% in 1996 to 2.56% in 2019) (see Figure 5).

![Figure 5: R&D Expenditure, as a Percent of GDP](Data source: World Development Indicators, The World Bank, 2022)
South Korea now exports the largest share of high-technology goods exports, as a percent of manufactured exports, even more, extensive than the U.S. and Germany, two of the global leaders in innovation and high-tech industry. Between 2007 and 2020, South Korea continued to export over 35 percent of high-technology exports, products with high R&D intensity, of its total manufactured exports, while OECD members only export about 20 percent of its total manufactured exports (see Figure 6).

The high R&D intensity that helped South Korea become a global leader in information and communication technologies has emerged from a historically top-down innovation system that promotes close collaboration between government, industry, and the academic community in nation-building. However, successful innovation cannot happen in isolation. It must be an open process involving cooperation at an early stage. This cooperation must be between academia, the government, and the private sector at a local level. In recent years in South Korea, although government funding continued to promote R&D spending and programs to boost translational development and scientific, engineering, and managerial expertise, the weight of significant investment in R&D shifted to the corporate sector in search of patents and profits. Private R&D spending accounted for nearly 80% of South Korea’s total R&D spending in 2019, ahead of leading innovative nations such as Germany, at 70%. The shift was supported by R&D tax incentives and the importation of foreign technology.

3.3. Promoting Entrepreneurship and Business Environment

According to the World Bank, South Korea was ranked No. 4 in the overall Ease of Doing Business (DB) index in 2018, while the U.S. is ranked No. 6 (The World Bank, 2018). Among the list of criteria, South Korea dominates in terms of the ease of starting a business and enforcing contracts. They all play a significant role in encouraging investment, production, communication, and, eventually, economic growth.

South Korea achieved 133 percent of the market capitalization of listed domestic companies (% of GDP) in 2020, while Germany achieved 60 percent of the market capitalization of listed domestic companies (% of GDP) in 2020 (see Figure 7).

In addition, South Korea tops the region in the entrepreneurship environment with a score of 54%, according to the recently released Global Entrepreneurship Index (The GEDI Institute, 2020). The country jumped three spaces up from the last year. The tech giant has been ahead in producing new technologies and introducing new products to customers.

4. Conclusion and Policy Recommendations

South Korea’s economic performance over the last 60 years was attributed mainly to good fundamentals,
including a high savings rate, solid human capital, sound institutions, and prudent fiscal and monetary management. Moreover, trade openness provided access to inexpensive imported intermediate goods, larger markets, and advanced technologies, thereby contributing to rapid productivity growth in the nation’s manufacturing industries. On the supply side, structural reforms to stimulate productivity growth could, for example, emphasize the development of modern services industries, including health care, education, telecommunications, business processing, and legal and financial services. In addition, efforts to ease product regulations and lower barriers to foreign investment would promote competition and technological innovation.

The question for South Korea in the 21st century, the digital and global era, is whether it can move into the ranks of the world’s top seven economies? South Korea sits in a challenging neighborhood. While Japan leads South Korea in high-tech prowess, China narrows its technological gap. Furthermore, given that both China and Japan have many more people, it is unlikely that South Korea will ever match them on an economic scale. As China is catching up technologically, South Korea needs to become more innovative and establish itself more solidly as superior quality and design producer. The trade war between China and the United States and South Korea’s economic conflicts with all three countries has not helped. The country is not just dependent on all three markets for exports but needs technology imports from Japan. In contrast, the final assembly has been outsourced to China. With the rise of the BRIC and ASEAN nations, South Korea’s prospects of reaching the top tier of international economies appear to be considerably lesser.

Therefore, South Korea needs to continue to be economically competitive enough to deliver prosperity to its people by taking advantage of choosing technologies in which it can be world-class. The most critical technology areas may be IT, nanotechnology, life science and engineering, energy and the environment, advanced instruments, and clinical medicine. South Korea is a world leader in IT, including cell phone and digital-TV technologies, but its lead is narrowing. Moreover, in life science and engineering, South Korea is not as competitive as it was; it also needs to be aware of newly emerging technologies, which it does not lead at all.

As a relatively small country, South Korea cannot do everything. Moreover, as a country largely lacking natural resources, it must depend on its wits. That means making choices: it would be better to be brilliant at a few technologies than mediocre in many of them. Therefore, in cooperation with the universities and the private sector, the government should map out, in broad terms, a national science strategy. The goal is to identify crucial technology areas where South Korea can be top tier. This goal will be the key to raising the economy to the next level. For example, cars and
televisions were important to South Korea, but they also needed to explore new economic frontiers. The advantage of selecting a few high-value fields to concentrate on is that it plays to the country’s strengths. According to the United Nations Educational, Scientific and Cultural Organization, South Korea sends a higher proportion of students to tertiary education than any other country. With this base, nurturing a generation of scientists and engineers is very much a possible dream.

Beyond recovering from the crisis, the critical economic challenges are the implementation of the Green New Deal, the decarbonization of the economy, and the reduction of export dependency. While the income-led growth campaign and the Green New Deal mark important steps forward, the challenge is to translate them into fundamental institutional changes that go beyond the green industrial policies of the past.

References


