

Executive summary

Key findings

The Korean success story of economic catch-up is widely recognised as a prime example of achieving socio-economic growth and development. This accomplishment was made possible by the science, technology and innovation (STI) ecosystem, which played a critical role in integrating new technology from abroad. This development has helped Korea sustain rapid progress towards the global innovation frontier with the potential to lead global markets in crucial digital technologies such as in 6G infrastructure.

Korea has some of the world's highest innovation inputs in terms of human capital and research spending. Korea has the highest share of tertiary graduates among OECD countries, many of whom are in the science, technology, engineering and mathematics (STEM) disciplines. The young are particularly adept at using digital and ICT technologies, which enables employers to integrate emerging technologies quickly. Besides human capital, financial inputs for innovation, as measured by gross domestic expenditure on R&D (GERD), ranks second worldwide with 4.93% of GDP in 2021.

The Korean society and economy must proactively address societal challenges and global transitions such as the digital transformation, population ageing and the green transition. Although Korea excels in certain digital technologies, not all firms have the necessary capacity to adopt emerging technologies, which poses risks, particularly for small and medium enterprises (SMEs) and their competitiveness. Furthermore, by 2050, Korea is projected to experience the most significant increase in its old-age population compared to its working-age population, which poses a further threat to economic growth. Among OECD countries, Korea also possesses the lowest proportion of renewable energy in relation to its total primary energy supply, which requires substantial investment, particularly in the emission-heavy energy and manufacturing sectors.

The government provides strong support to SMEs, but innovation activity is still concentrated in large firms. Seoul has emerged as one of the globally leading start-up ecosystems, thanks to significant financial and structural support that ensures ease of doing business, along with an advanced ICT infrastructure and access to public sector innovation. Nevertheless, start-ups experience challenges when trying to scale-up internationally. Support for other SMEs appears to be less effective, with low levels of innovation and the second-highest productivity gaps with large firms among OECD countries.

Productivity gains and innovative activity have largely been concentrated in specific sectors. There is a large gap in growth, productivity and R&D spending between the manufacturing sector (in particular, ICT manufacturing) and the service sector. Going forward, it is important to foster high-value-added services in particular. Despite various policy measures and successes in some areas, results have thus far fallen short of the potential, and a significant gap in growth and productivity persists between ICT and non-ICT sectors. With a high share of employment in the ICT industry, there is a risk that other sectors are falling behind, especially in the context of the digital transformation. As the young, well-educated and urban population continues to benefit from Korean leadership in the ICT and manufacturing sectors, this remains vital to prevent exacerbating inequality.

A forward-looking vision for the Korean research system will need to enhance autonomy in universities and government research institutes and foster high-risk, high-return research with long-term impact and breakthrough potential. The public administration of the research system will need to enhance long-term focus, risk tolerance, and application of the subsidiarity principle, as well as an emphasis on qualitative performance assessment, to promote high-risk, high-reward research. Significant recent efforts to do so include the National Research and Development Innovation Act. Whether these efforts have achieved their intended outcomes needs to be assessed in the future.

STI governance in Korea is based on a strong foresight system featuring ambitious mid- to long-term plans and strategies involving the whole of government, but co-ordination can be improved.

There is a unique, comprehensive, and centralised multi-step process in place to determine the strategic directions for STI across the government. However, inter-ministerial co-ordination remains an important challenge and needs to be improved to help Korea tackle societal challenges through research and innovation. Overall, the existing co-ordination process appears to be overly burdensome and focused on the allocation of resources and the management of budgetary competition among ministries. Emerging problems and new priorities tend to be addressed through reallocation and reshuffling of funding rather than the development of a coherent and holistic R&I policy. The recently established challenge-led schemes and the ambitious mission-oriented policy strategy present a promising model for the future of Korean STI policy, should they be based on a systemic approach to promote continuous strategic dialogue across the government.

Key recommendations

This review has developed three main pillars with specific recommendations the Korean government can consider to prepare its STI system for a new era of innovation.

I. Promote cross-cutting strategy and foresight.

There is a need for a shared vision that brings together various long-term sectoral strategies to define the contribution of STI to Korean society. The STI system should be oriented to enable transitions and address societal challenges by adopting a whole-of-government approach, experimenting with mission-oriented policies, and ensuring continuity across government mandates. Furthermore, the Korean STI system needs to further internationalise through projects, researcher mobility and participation in international research infrastructures.

II. Support business innovation.

The role of the services sector, particularly in fostering innovation in knowledge-intensive services, needs to be amplified. Korea needs to strengthen the diffusion of innovative technologies to SMEs and bolster the global connectivity of start-ups. This could be accomplished through a range of policy initiatives, including reducing administrative burdens, developing skills, fostering co-operation with large businesses and academia, and implementing targeted support programmes.

III. Strengthen the research system.

To better serve Korea's needs in the post-catch-up era and amidst global transitions, the capabilities of universities and GRIs to conduct excellent research must be strengthened. This can be achieved by promoting the autonomy of academic institutions, enhancing evaluation and assessment systems, tailoring the financing model of these institutions to align with the achievement of their objectives, promoting co-operation between GRIs and universities, and creating targeted programmes for high-risk, high-reward research.



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