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Chapter:

4. Smart specialisation approaches

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Abstract

The 2015 series of RIO Country Reports analyse and assess the policy and the national research and innovation system developments in relation to national policy priorities and the EU policy agenda with special focus on ERA and Innovation Union. The executive summaries of these reports put forward the main challenges of the research and innovation systems.
4. Smart specialisation approaches

4.1 Governance and funding of regional R&I

It is not uncommon in Chinese R&I policies and programmes that some industry sectors or technologies are picked by the governments as priorities for intensive investment. The rationale behind the prioritizing is that the country needs to concentrate the limited resources on certain important areas in which China is lagging behind the international technology frontier and the backwardness has negative impact on the social and economic development or national security. In the MLP announced in 2006, 13 technologies are prioritized which include core electronic devices, high-end generic chips and basic software, super large-scale integrated circuit manufacturing technology and associated techniques, the next generation broadband mobile telecommunication, high-end numerically controlled machine tools and basic manufacturing technology, the development of large oil-gas fields and coal-bed methane, large advanced pressurized water reactors and high temperature gas-coolant reactor nuclear power stations, water body contamination control and treatment, new genetically modified varieties, major new drugs, prevention and treatment of major infectious diseases such as HIV/AIDS and viral hepatitis, large passenger aircrafts, high resolution earth observation systems, manned space flights, and the moon probe.

The “Made in China 2025” announced in May 2015 also identifies 10 priority industrial sectors for policy and funding support: 1) New generation information technology; 2) Automated machine tools and robotics; 3) Space and aviation equipment; 4) Maritime equipment and high-tech shipping; 5) Modern rail transportation equipment; 6) New energy vehicles and equipment; 7) Power generation equipment; 8) Agricultural equipment; 9) New materials; and 10) Biopharma and advanced medical products. In the more recent policy document such as the 13th Five-Year Plan announced in March 2016, though it is not a R&I program, certain industries and sectors are also prioritized such as agriculture, energy, industry, environment, health, new-type urbanization, and so on.

Sub-national governments contribute about one-third of the total government investment in R&D. However, in terms of priority and agenda setting in the R&I policy, the central government is more authoritative than the local governments. The most important policies and guidelines are discussed and enacted at the level of the central government. Once the national plan and objective is set, the individual provinces or cities will make their respective plans and strategies, matching the national plan.

However, regional governments (provinces and municipalities) in China are granted a high degree of autonomy for regulating and managing the local economy and society (Xu, 2011). They make their own deliberation over the industries and technologies that they possess favourable conditions to develop, given their geographical condition, resource endowments, history and so on. Therefore, the prioritized industries or technologies chosen by a region may not be identical to the national ones. Quite often many regions compete for favourable policies and bank investment etc. to develop the nationally prioritized industries or technologies in their purview. In that case, it is up to the central government to pick the candidate regions. A recent case is the development of big data industry in the Southwestern province Guizhou. Guizhou is a less developed province located in the South-western part of the country. Because of its mountainous terrain and remote geographical location, the economy in Guizhou has been less developed than that of the most other provinces in the country. However, Guizhou government started as early as in 2014 to boost the development of big data industry by undertaking pilot projects of integrating data possessed by the provincial government, organizing big-data business model innovation competition, creating the first big-data trading market in the world and also hosting the first international big-data expo. All these efforts created momentum and attracted companies and talents to locate in Guizhou. In August 2015, in the Strategy of Big-Data Development announced by the State Council, it is explicitly mentioned that the central government supports creating a
big-data experiment zone in Guizhou province. In 2016, the central government formally approved to establish a national-level experiment zone in the province.

In terms of S&T funding, the economically developed provinces can appropriate substantial budget to finance S&T activities, as the top five Chinese provinces are ranked in between 16th to 28th position in the world by the size of GDP. In the provincial governments, specialized departments such as the Beijing Municipal Commission of Science and Technology, Science and Technology Commission of Shanghai Municipality and Guangdong Provincial Department of Science & Technology, are responsible for managing S&T funds, similar as the Ministry of Science and Technology oversees a large amount of S&T investment by the central government.

4.2 Smart specialisation approaches

Feedback from the business community and stakeholders are important for enacting effective R&I policies. The Chinese policy makers often use the following channels to consult entrepreneurs and stakeholders: 1) expert committee. The discussion and enactment of major policies and guidelines usually involve a group of experts. For example, the expert committee of the 13th Five-Year Plan consists of 53 experts, including university professors, scholars from think tanks and senior officials from government agencies and renowned entrepreneurs. 2) consultation meetings. Periodically the Premier will invite entrepreneurs and scholars to discuss the to-be-launched policy documents and status of economic and social development. 3) visit and on-site meetings. Periodically the officials at the central government and local governments will visit companies, science parks, universities, research institutions and have discussion on-site with entrepreneurs, scholars and researchers on the issues related to R&D. 4) commissioned research. The governments at all levels commission scholars in universities, research institutions and think tanks to research policy instruments regarding R&I, through which scholars are involved in policy making related to R&I.

The Ministry of Science and Technology conducts technology foresight periodically. The Planning and Development Department of the Ministry and Chinese Academy of Science and Technology for Development, a think tank affiliated with the Ministry were responsible for the technology foresight exercise in 2013

4.3 Regional linkages to economic competitiveness

As early as in 2001, the Chinese government announced the “go global” strategy, encouraging Chinese companies to invest abroad, pursue product diversification, and promote brand recognition of Chinese companies in the EU and US markets. The outbound investment strategy was integrated with the continuous effort to promote foreign capital inflow to boost China’s overall involvement in the global economic cooperation. The strategy made use of opportunities brought by China’s anticipated accession into the World Trade Organization (WTO) in 2001. In around 2001, China amassed huge amount of foreign reserves, thus putting upward pressure on the foreign exchange rate of Renminbi, the Chinese currency. Pursuing the “go global” strategy can create demand for foreign reserves, thus alleviating the pressure on appreciating value of RMB. Since the launching of the going global strategy, Chinese companies’ interest in overseas investment has increased significantly. In 2014, the FDI (foreign direct investment) outflow from China amounted to €87.3 billion (USD 116 billion), making China ranked third in the world in terms of volume of outward FDI only after the US and Hong Kong, China (World Investment Report, 2015).

In the science area, Chinese scholars are also encouraged to collaborate with international partners. The National Natural Science Foundation of China established various projects to fund the joint research activities. For example, the NSFC set up a Sino-German Science Centre with its German counterpart Deutsche Forschungsgemeinschaft in 1998 to fund bilateral seminars and joint projects. The Ministry of Education also allocated funds to sponsor Chinese scholars and students’
overseas visiting research through the China Scholarship Council, an organization established in 1996 and affiliated with the Ministry.

4.4 Assessment

In spite of China's openness to market forces, however, Beijing’s autocratic system of governance largely persists, providing ample room for the Chinese government to enact and implement industrial and innovation policy to enhance the technological capabilities of Chinese companies. This represents an advantage when the Chinese government set priorities for R&I activities. It allows the government to concentrate limited resources on certain areas that the country and the industry urgently need breakthroughs, avoiding that resources are too thinly spread.

However, China is a large country. Development across region is not homogeneous and balanced. The R&D investment and activities are largely concentrated in the coastal regions in the east. Although regional governments (provinces and municipalities) in China are granted a high degree of autonomy for regulating and managing the local economy and society, the challenge remains in the underdeveloped regions and areas. There have been efforts to address these disparities though. For example, in 2012, the Ministry of Education released the Revitalization Plan for Higher Education Institutes in Mid- and Western China. A more recent example is that the Guizhou province, which is geographically remote and economically less developed region in China, is approved by the central government to establish a national-level big-data experiment zone, providing conditions to develop big-data industries in the region.