

Key Findings

Key Findings of Chapter 1

The six key findings of Chapter 1 of the GII 2016 are pertinent to this year's theme of 'Winning with Global Innovation'. They fall into two general categories: strategies for innovation that can support global goals and observations about geographic regions.

Finding 1: Leveraging global innovation to avoid a continued low-growth scenario

Investments in research and development (R&D) and innovation are central for economic growth. Whether we consider the longstanding champions of innovation—typically the countries that have been repeatedly part of the top 25 of the GII—or those, such as China, the Republic of Korea, and Singapore, that have made continuous and rapid progress, we see a common pattern by which innovation has remained a key priority, supported by a steady flow of R&D spending.

The global economy is not back on track. Concerns about weak future output growth and low productivity are now serious. In this light, uncovering new sources of productivity and future growth are the priority. More efforts are needed to return to pre-crisis R&D growth levels and to counteract an apparent R&D expenditure slowdown in 2014, which was caused by both slower growth in China and other emerging economies and tighter R&D budgets in high-income economies.

The question faced by the innovation community is how to more systematically spread R&D to low- and middle-income economies, thus avoiding an overreliance on a handful of countries to drive global R&D growth. Even leading emerging countries, including China, still spend only a small share of their research budget on basic R&D; instead they focus on applied R&D and development.

Policy makers are urged to step up public investments in innovation to boost short-term demand and to raise long-term growth potential. Successful innovation strategies cannot afford 'stop-and-go' approaches: if R&D expenses or incentives to innovators are not sustained, the progress accumulated in previous years can vanish quickly.

Finding 2: Need for a global innovation mindset and fresh governance frameworks

It is now common wisdom that science and innovation are more internationalized and collaborative than ever before. All stand to gain from global innovation. First, more innovation investments are conducted today than at any other time. Second, through international openness, the potential for global knowledge spillovers are on the rise. Finally, innovation actors in emerging countries now make meaningful contributions to local and global innovation.

Still, innovation is sometimes not portrayed as a global win-win proposition. On the contrary, most metrics and innovation policies are designed for the national level. Countries are regularly perceived as 'contenders rather than collaborators'. In some cases, 'techno-nationalist policies' erecting barriers to different knowledge flows have become a popular endeavour.

What is needed to better communicate and amplify the benefits of global innovation and related cooperation? First, measurable evidence regarding the organization and outcomes of the current global innovation model is missing. Although empirical economic work has gone a long way towards supporting international trade as a win-win strategy and in constructing appropriate indicators, the same is not true for global innovation.

Second, although difficult to measure, there seems to be ample scope to expand global corporate and public R&D cooperation. Business strategies and public policies need to better approach innovation as a global positive—rather than as a zero-sum—proposition and better complement the realm of national innovation systems.

For firms, global innovation has been a long time in the making. Yet, despite this positive trend, untapped potential exists according to the analysis presented in this report. Most companies in high-income countries

and nearly all firms in emerging economies still run all of their innovation activities at their corporate centres. A new corporate innovation culture is required to benefit from global innovation. This entails flatter hierarchies and increased cross-functional collaboration across R&D, supply chain management, and marketing; a diversified talent pool that brings in fresh perspectives and skills; an environment that encourages risk-taking; and experimenting with novel partnership models and innovation platforms.

For national policy making, facilitating increased international collaboration and complementing inward with more outward-looking approaches is key to sustained success in innovation. New ideas are emerging in different parts of the globe and successful innovation strategies have to leverage them effectively. Identifying barriers to global cooperation and the flow of ideas should be a new innovation policy priority. Fiscal incentives, grants, and other national innovation policies could more explicitly favour international collaboration and the diffusion of knowledge across borders. Calls for proposals could, more often, be jointly issued by multiple countries, particularly when convening large-scale, multi-disciplinary programmes or when planning large critical research infrastructure.

Science and innovation policies should also become more inclusive of developing countries. Revamping official development assistance with the inclusion of R&D and innovation components is a welcome development. The crafting of globally focused demand-side innovation policies to support the generation and diffusion of innovation addressing local needs must also be a priority of policy makers. Appropriate

innovation for and from low- and lower-middle-income economies is desperately needed.

Are new governance systems needed to improve global innovation cooperation? This question should be at the centre of future innovation policy debates. The challenge is to move towards increased global innovation cooperation via more inclusive governance mechanisms. The latter need to produce more measurable outcomes that are evaluated over time and more clearly communicated.

In addition to helping with growth, ultimately smart, globally orientated innovation policies and a new global innovation mindset can provide a timely counter to rising sentiments of nationalism and fragmentation.

Finding 3: Innovation is becoming more global but divides remain

The GII rankings have shown a remarkable level of global diversity among innovation leaders over the years. In 2016, the GII remains relatively stable at the top. Switzerland leads the rankings for the sixth consecutive year. Yet among the top-ranked 25 innovation nations this year are not only economies from Northern America (such as Canada and the USA) and Europe (such as Germany, Switzerland, and the UK) but also from South East Asia, East Asia, and Oceania (such as Australia, Japan, Korea, and Singapore) and Western Asia (Israel).

Economies that perform at least 10 percent higher than their peers for their level of GDP are labelled ‘innovation achievers’; they include many economies from Africa, such as Kenya, Madagascar, Malawi, Rwanda, and Uganda; one from Northern Africa and Western Asia (Armenia); one from South East

Asia, East Asia, and Oceania (Viet Nam); and several from Central and Southern Asia (such as India and Tajikistan). A wide variety of countries outperform their income group on at least four of the seven GII pillars; these include countries such as Bhutan, Brazil, Cambodia, Costa Rica, Georgia, Indonesia, Mexico, Morocco, the Philippines, South Africa, and others.

A symbolic first step in closing the divide between developed and developing countries has also been made: China is the first middle-income economy to join the top 25 of the GII, a group typically composed of high-income countries. China also moves to 17th place in innovation quality this year, narrowing the distance with the high-income economies.

Yet, rather than levelling the playing field, a multipolar world of research and innovation has emerged. The majority of activities are still concentrated in high-income economies and select middle-income economies such as Brazil, China, India, and South Africa. Only China has seen its R&D expenditures or other innovation input and output metrics move closer to rich countries such as the USA. Other middle-income economies remain distant; Malaysia slipped further away this year. The divide between the group of upper-middle-income economies and the group of high-income economies is large, especially in the Institutions, Human capital and research, Infrastructure, and Creative outputs pillars.

Some progress can be detected among lower-middle-income economies. India is a good example of how policy is improving the innovation environment. In some dimensions—such as ICT services exports and creative goods exports—India is starting

to excel. Similar peaks of excellence exist among other middle-income economies.

On another positive note, low-income economies successfully continue to close the innovation divide that separates them from middle-income economies—in particular in the pillars on Institutions and Business sophistication.

Finding 4: There is no mechanical recipe to create sound innovation systems; entrepreneurial incentives and ‘space for innovation’ matter

There is no automatism or mechanical recipe for creating sound innovation systems. Absolute spending on R&D or absolute figures on the number of domestic researchers, on the number of science and engineering graduates, or on scientific publications do not guarantee a successful innovation system. In fact, all too often a higher share of science and engineering graduates, for example, is pursued as a panacea for creating sound innovation systems. Clearly policy makers have to start somewhere, and this factor is easily measurable. Yet the creation of sound innovation systems—with solid innovation inputs, sophisticated markets, a thriving business sector, and sturdy linkages among innovation actors—and assessing their performance is more complex than aiming at increasing one innovation input variable, as evidenced in the GII model.

One approach to overcoming a purely quantitative approach is to look at the quality of innovation, as the GII does, assessing the worth of universities, scientific output, and patents. Good quality remains a distinct characteristic of leaders such as Germany, Japan, the UK, and the USA. China is the

only middle-income country showing a comparable innovation quality. India comes in second among middle-income economies.

Yet there is more to the story. High-quality innovation inputs and outputs are often the reflection of other factors that make an innovation ecosystem healthy, vibrant, and productive. Ideally, these systems become self-perpetuating, bottom-up, and without a recurrent need for policy or government to drive innovation. How best to create such an organic innovation system poses an interesting dilemma for governments and their role in future innovation policy models. On the one hand, it is now accepted that governments continue to play an important role in generating innovation. The boundaries between industrial and innovation policy are slim or non-existent; both play an important role. In particular, in the last few decades, Asian economies have benefited from a strong and strategic coordination role of governments in innovation. The role of governments in spurring innovation in high-income countries in Northern America and Europe has also been strong throughout history.

It can be argued that the role of governments, and also of public and coordinated private investments, might be even more significant today than it has been in the past. Driving future innovation in the fields such as travel, health, and communications is becoming more complex and costly.

On the other hand, if governments overreach, if they select technologies, they might quickly end up diluting the possibility of self-sustaining organic innovation ecosystems. Providing enough space for entrepreneurship and innovation; the right incentives and

encouragement to bottom-up forces such as individuals, students, small firms, and others; and a certain ‘freedom to operate’ that often challenges the status quo is part of the equation. Surely developing countries are well advised to avoid over-relying on government forces as the sole driver to orchestrating a sound innovation system.

For governments, finding the right balance between intervention and laissez-faire has never been as challenging.

Finding 5: Sub-Saharan Africa: Preserving the innovation momentum in one of the most promising regions

For several editions, the GII has noted that the Sub-Saharan Africa region performs well on the innovation front. Since 2012, Sub-Saharan Africa has had more countries among the group of innovation achievers than any other region. Kenya, Madagascar, Malawi, Mozambique, Rwanda, and Uganda—often oil-importing countries—perform better than their level of development would predict. Importantly, Kenya, Malawi, Mozambique, Rwanda, and Uganda stand out for being innovation achievers at least four times in the past five years.

Noted improvements in the Institutions, Business sophistication, and Knowledge and technology output pillars have allowed the region as a whole to catch up to Central and Southern Asia in these factors, and even to overtake Northern Africa and Western Asia. Led by economies such as Botswana, Mauritius, Rwanda, and South Africa, Sub-Saharan Africa countries this year show their highest scores in Institutions and in Market sophistication. Larger economies, such as Botswana and Namibia, show

stronger performances in the General infrastructure and Ecological sustainability sub-pillars.

Yet the relatively strong performance in innovation in the region is neither uniform across all economies nor is future success guaranteed. Indeed, economic forecasts predict that Sub-Saharan Africa will face an economic slowdown. As economic slowdown occurs, it will be important for Africa to preserve its current innovation momentum and to continue moving away from relying on oil and commodity revenues.

has entered into a zone of considerable economic turbulence, it will be important to overcome short-term political and economic constraints and to cling to longer-term innovation commitments and results. Greater regional R&D and innovation cooperation in Latin America might indeed help in this process, as underlined in this year's GII theme.

Finding 6: Latin America and the Caribbean: A region with untapped innovation potential but important risks in the near-term

In the last few GII editions, Latin America was labelled as a region with important untapped innovation potential. Although significant potential exists, the GII rankings of local countries, relative to other regions, have not steadily improved. Furthermore, none of the economies in the region has recently been an innovation achiever, with performance higher than expected by its GDP. Still, a few economies—such as Chile, Colombia, and Mexico—stood out among their peers; the important role of Brazil and the emergent role of Peru and Uruguay were noted in past GII editions. And, this year, Chile, Colombia, Costa Rica, Mexico, and Uruguay achieve the best regional GII ranks again.

Clearly, most if not all countries in Latin America, particularly their local governments, firms, and other actors, continue to have the innovation agenda firmly on their radar. This is unlikely to come to a sudden halt anytime soon. Yet, as Latin America, especially Brazil,