

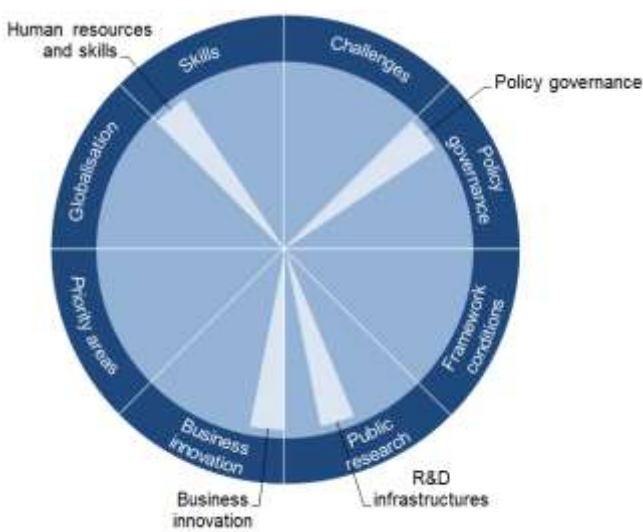
MALAYSIA

Malaysia is one of the most dynamic emerging economies in Southeast Asia, with sustained rapid average growth of over 6.4% per year since 1970 but it has also been facing challenges, especially since 1990s Asian financial crisis. Malaysia has reached a gross national income of USD 22 280 per capita in 2012. In 2013, the government announced the National Science, Technology and Innovation Policy (NSTIP) (2013-20), which provides strategic guidelines for STI policy and investment for Malaysia's transition to an innovation economy by 2020. The Science for Action (S2A) for the implementation of the NSTIP is one of the key strategic thrusts of the country's 11th Plan (2016-20).

Table 1. Gross domestic expenditure on R&D (GERD)

	MYS	OECD
GERD		
USD million PPP, 2012	7 334	1 181 495
As a % of total OECD, 2012	0.7	100
GERD intensity and growth		
As a % of GDP, 2012	1.13	2.38
(annual growth rate, 2008-12)	(+14.5)	(+2.3)
GERD publicly financed		
As a % of GDP, 2012	0.60	0.61
(annual growth rate, 2008-12)	(+15.1)	(+2.5)

Figure 1. Major STI policy priorities, 2016



Hot issues

Strengthening public R&D capacity and infrastructures

Malaysia's expenditure on public R&D, at 0.46% of GDP, is at the lower end of the OECD middle range (4^a) and comparable to that of China (0.47%) and Russia (0.46%). Between 2001 and 2011, science and engineering articles produced by Malaysia increased by 16% a year, slightly faster than the increase of China's (15.6%). Going forward, the government envisages a public research sector that serves as a solid knowledge base and an effective diffusion channel within the national innovation system. To this end, the National Science and Research Council (NSRC) made several recommendations in 2013; to create a Research Management Agency under the NSRC to improve the management of public research; to establish an industry research nexus as a



platform for public research and industry collaboration in order to improve the relevance and marketability of public research; to review, restructure and realign PRIs; and to enhance human capital and related funding and improve the research ecosystem and culture. Public spending on R&D continue to increase, with USD 428.6 million (MYR 600 million) allocated to five research universities in the 2013 budget for high-impact research in strategic fields such as nanotechnology, automotive technology, biotechnology and aerospace.

Improving overall human resources, skills and capacity building

While Malaysia spends a large share of GDP on higher education (4th), there is room for improvement in overall investment in human capital and in the workforce's industrial skill development. In addition, Malaysia needs to develop, attract and retain the highly skilled to further strengthen the human resource base. In 2013, the Ministry of Education (MOE) launched the Malaysia Education Blueprint (2013-25), which aspires to improve the Malaysian education system in terms of access, quality, equity, unity and efficiency. One of its major thrusts is to strengthen STEM throughout the education system. To enhance the supply of high-end STI personnel, the blueprint sets a target of producing 60 000 Malaysian PhDs by 2025. To this end, the government launched the MyBrain15 programme, which offers three types of scholarships: MyMaster, MyPhD and Industrial PhD. Wide-ranging measures to enhance the innovative skills of the workforce, intensify STI brain gain and brain circulation, improve the talent management system and develop a dynamic career for researchers are also being implemented.

Encouraging innovation in firms and supporting entrepreneurship and SMEs

While Malaysia has achieved robust economic growth in the past half-century, moving from a primary sector to a multi-sector economy with high-technology manufacturing and services, the country's STI capabilities need to be further developed. The government's 10th Malaysia Plan (2011-15), which aimed to make Malaysia an innovation-led economy, promoted the private sector as the main driver of growth through increased private-sector investment and commitment to STI. Several measures to promote industrial innovation, including fiscal and financial incentives, support to consortia and clusters, public-private partnerships, and the promotion of science-industry linkages and knowledge transfer have been introduced. The government has allocated R&D funds, e.g. the TechnoFund, ScienceFund, InnoFund, Technology Acquisition Fund (TAF) and others, to various agencies and ministries. In order to encourage priority sectors to increase BERD, several industrial research institutes were launched. For example, the Aerospace Malaysia Innovation Centre (AMIC) was established to provide focused R&T research.

Improving the governance of the innovation system and policy

Malaysia has adopted a quadruple helix approach to improve interactions among government, academia, industry and society in order to implement the nation's STI policies, programmes and priorities more effectively. However, as many agencies continue to be engaged in STI policy making, funding and programming, a central body is needed to oversee and co-ordinate at the national level. One of the objectives of S2A is to strengthen public services and governance to ensure an ecosystem that will facilitate the development and uptake of S&T. The government recently established the National Science, Technology and Industry Council, which aims to rationalise the many science- and industry-based councils. Additionally, there are plans to establish a National Science and Research Board to co-ordinate the STI strategies of different agencies and align them with national strategies and priorities in addition to strengthening the management of STI programmes. Because the country's evaluation capabilities are weak, assessments of STI policies and programmes are not regularly undertaken.



Some key STI performance indicators

Figure 2. Environmental performance

Green productivity, GDP per unit of CO2 emitted, index 2005=100

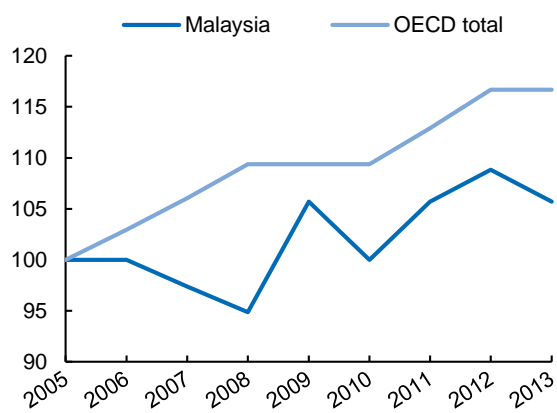
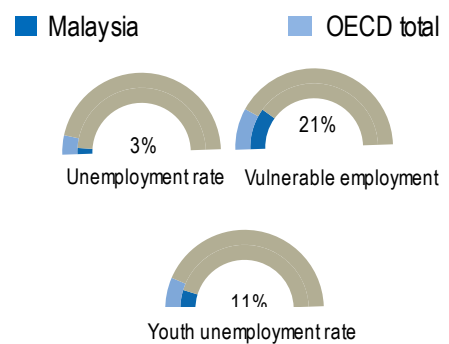


Figure 3. Unemployment

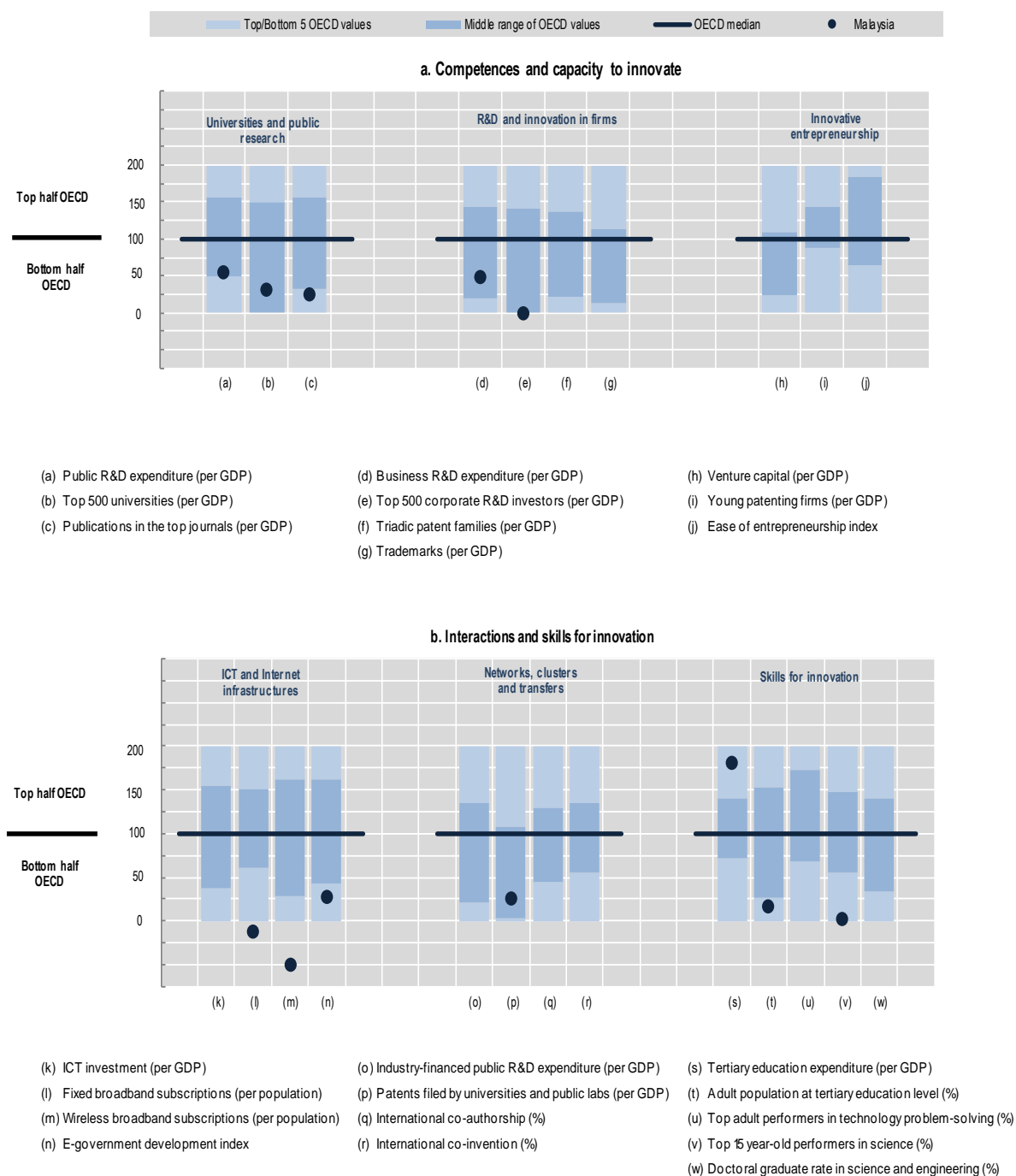
2015 or latest year available



Benchmarking national STI systems

Figure 4. Science and Innovation in Malaysia

Comparative performance of national science and innovation systems, 2016



Note: Normalised index of performance relative to the median values in the OECD area (Index median=100).



Highlights of the Malaysian STI system

New challenges

The National Science and Research Council (NSRC) has established nine R&D priority areas: biodiversity, cybersecurity, energy security, environment and climate change, food security, medical and health care, plantation crops and commodities, transport and urbanisation, and water security. The Green Technology Financing Scheme (GTFS) was established in 2010 to accelerate the expansion of the green technology industry by improving access to bank credit financing. USD 2.5 billion (MYR 3.5 billion) in bank credit is available for use by 2015. Currently 127 projects are financed with a total of USD 1.26 billion (MYR 1.77 billion). In addition, several grassroots innovation schemes have been introduced in recent years to exploit the rich potential opportunities arising from the knowledge/practices of traditional communities. Under the NSTIP, an Innovation Inclusive Roadmap will be prepared to address the concerns of disadvantaged and low-income communities.

New sources of growth

The New Economic Model, unveiled in 2010, selected 12 national key economic areas (NKEAS), chosen on the basis of their potential to raise income and promote **Malaysia's global competitiveness over the coming decade**, such as: oil, gas and energy; palm oil and rubber; business services; electronic and electrical; education; and health care. Policy interventions are mainly implemented in the spirit of public-private partnerships, with public agencies mandated to provide eco-systems that are conducive to innovation and commercialisation, while business entities are expected to foster business and entrepreneurial agendas.

Innovative entrepreneurship

Industrial innovation has been limited and confined to the more dynamic export-oriented firms. Fewer than 10% of SMEs engage in R&D although they constitute almost 95% of manufacturing establishments. To help build a more entrepreneurial culture, courses on basic entrepreneurship skills have been made compulsory in all undergraduate programmes. Launched recently, the Malaysian Global Innovation and Creativity Centre (MaGIC) initiative with USD 35.7 million (MYR 50 million), helps domestic and international entrepreneurs to start and grow their businesses in Malaysia.

Technology transfer and commercialisation

Malaysia's R&D landscape includes PRIs and research-based universities. All public research universities are required to play a role in addressing societal welfare and/or commercialisation of research. The Malaysia Laboratories for Academia-Business Collaboration (Mylab) was established in 2015 to focus R&D on some abovementioned strategic fields (nano-, and biotechnologies, aerospace, automotive, rail, oil, and gas industries). The ScienceFund, InnoFund and TechnoFund, which are under the Ministry of Science, Technology and Innovation (MOSTI), promote the commercialisation potential of public-funded R&D outputs. Under the 10th Malaysia Plan, the MOE has launched the Knowledge Transfer Programme to facilitate the transfer of expertise and research findings through projects undertaken jointly by academia, industry and the community. To date, a total of 254 projects funded with some USD 25.7 million (MYR 36 million) have been launched with industry contributing about a quarter of the sum.

Globalisation

Chaired by the prime minister and formed by global industry leaders and renowned international experts, the Global Science and Innovation Advisory Council (GSIAC) is being set up as a sounding board for Malaysia's STI efforts. Key programmes initiated through this platform include the Malaysian Biomass Initiative, Smart Communities, and Human Capital Building. Existing programmes have been improved through the adoption of globally recognised best practices. International strategic collaborations were also

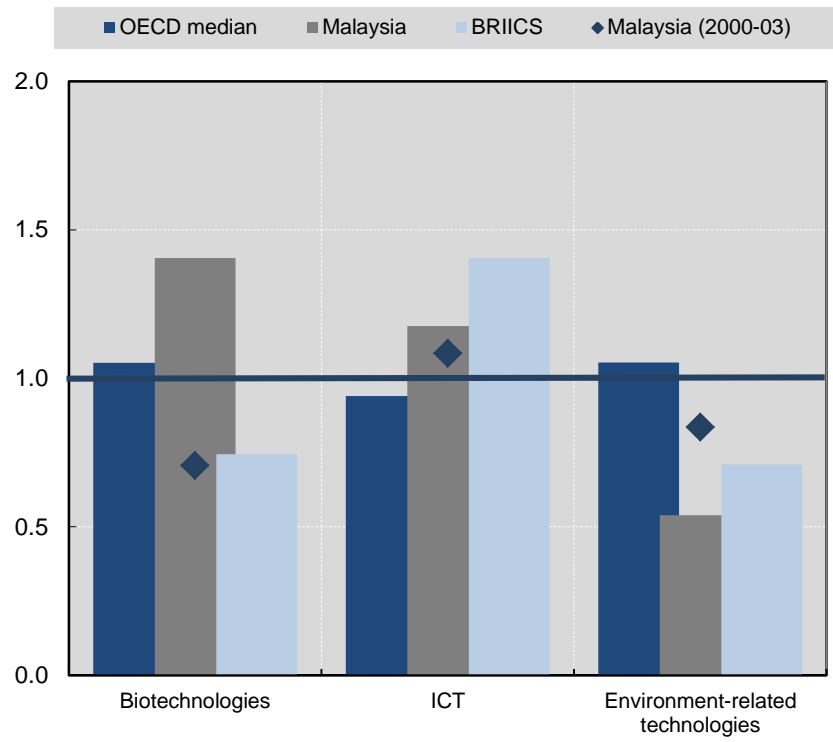


forged, including the STEM Program (MOE and UKM), the Nobel Mindset (PermataPintar™) and My Body is Fit and Fabulous (Ministry of Health). Malaysia has shared its STI development experience with developing countries and has contributed through financial and other support to international organisations such as the Commonwealth Partnership for Technology Management (CPTM), the Organization of Islamic Conference (OIC), and the International Science, Technology Innovation Centre for South-South Cooperation under the auspices of UNESCO (ISTIC), among others.

Structural aspects and specialisation

Figure 5. Revealed technology advantage in selected fields, 2011-2013

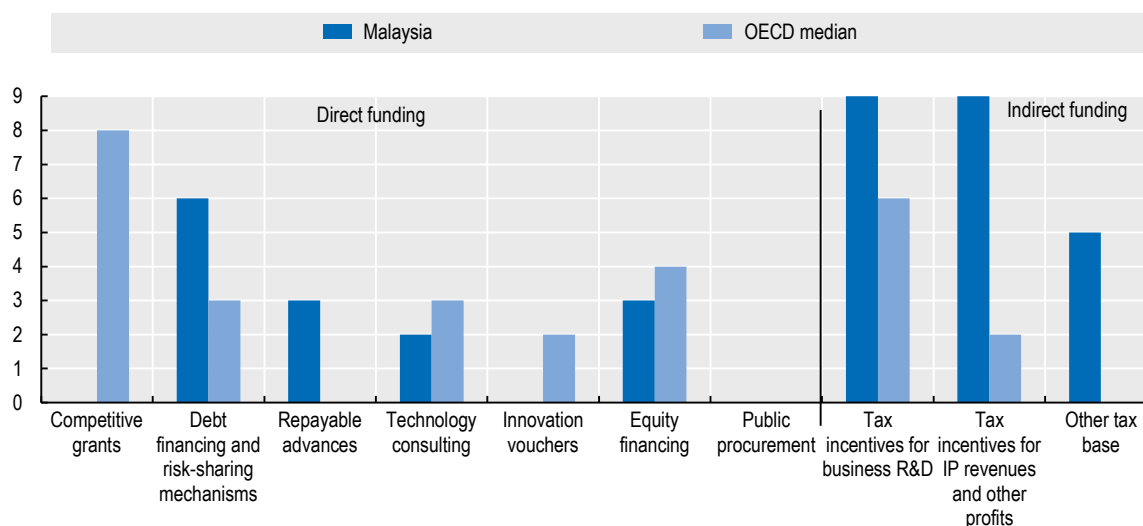
Index based on IP5 patent families applications



National STI policy mix

Figure 6. Most relevant policy instruments of funding for business R&D, 2016

Country self-assessment, index (9 = high and increasing relevance to 0 = not used)



Note: Policy information comes from country responses to the EC/OECD International Survey on STI Policies (STIP) 2016 and 2014. Malaysia's responses are available in the EC/OECD International Database on STI Policies, edition 2016 at http://qdd.oecd.org/DATA/STIPSurvey/MYS...STIO_2016.

Source: See the reader's guide and methodological annex.

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