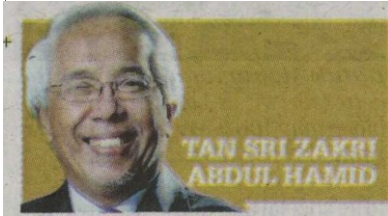


# The globalisation of research

**4TH REVOLUTION:** R&D investment fuels innovation, sharpens competitive advantage, creates new industries and allows exploitation of new opportunities



**W**E are living through what has been dubbed “the fourth industrial revolution”.

The almost daily introduction of remarkably innovative new materials, products and processes are transforming economies and society at an unprecedented and unpredictable speed and scale.

According to the World Economic Forum: “...when compared with previous industrial revolutions, the fourth is evolving at an exponential rather than a linear pace. Moreover, it is disrupting almost every industry in every country. And the breadth and depth of these changes herald the transformation of entire systems of production, management and governance.”

Countries are in a race to keep up or risk being left behind economically. This is evidenced by a surge in research and development (R&D) investments in recent years.

United Nations data reveal that worldwide R&D has grown from an (inflation adjusted) US\$660 billion (RM2.9 trillion) in 1990 to almost US\$1.5 trillion in 2013. And much of the growth in that timeframe came from here in Asia, where research funding almost quadrupled — from US\$167 billion to US\$623 billion.

The Malaysian Industry-Govern-

ment Group for High Technology is currently hosting the Asia Pacific regional meeting of the Global Research Council (GRC) in Kuala Lumpur.

The GRC is a virtual organisation, comprising the heads of science and engineering funding agencies around the world. It is dedicated to improving research at the regional

and global levels and promoting high-quality collaboration between countries.

Among other things, the GRC plays a crucial role in promoting collaboration between nations by creating, for example, standards and basic principles for peer review of research. These include the transparency of the evaluation process, impartiality and confidentiality, all important in creating trust.

Other active concerns include ensuring the accuracy of data and ethical standards in research involving human subjects. The meeting in Kuala Lumpur is one of five regional sessions designed to generate ideas for discussion at the GRC’s 6th annual global conference in Ottawa, Canada, in May next year.

The discussions here had two key areas of focus:

**HOW** do societies manage the contentious relationship between “fundamental research” — aimed at discovery for its own sake — and “innovation” — intended to generate more immediate economic growth and jobs? And,

**AS** research becomes a more global collaborative enterprise, and with so much at stake, how can we improve the efficiency and effective-

ness of collaborations to maximise results, enhance the quality of science, avoid unnecessary duplication, exploit economies of scale, and address issues of common concern that can only be solved by working together?

According to GRC papers prepared for the meeting, research is being shaped by increasing openness — more public communication, data sharing and citizen engagement.

As well, research has assumed a more “problem-based” focus over the past 20 years, involving larger teams of academic and non-academic experts from multiple disciplines.

To quote Senior Professor Datuk

Dr Khalid Yusoff, Vice-Chancellor and president of UCSI University: “The rise of international collaboration over the past two decades is dramatically increasing the impact and importance of research, and that success in turn is inspiring even greater funding of and cooperation among scientists.”

That cooperation is essential, as are the ambitious national investments, if we are to meet the daunting challenges ahead, which include meeting the 17 Sustainable Development Goals.

We need innovation to accelerate the generation of energy from renewable sources, to improve the quality of air, to make full use of precious fresh water resources, to create strong new building materials locally, to improve and protect health and agriculture, and in so many other vital areas.

It is especially encouraging that low- and middle-income nations, where spending on research and development has traditionally been limited, governments are reforming old funding agencies or creating new ones, and pouring money into them.

The benefits are many and large. R&D investment fuels innovation, sharpens competitive advantage and enables the creation of new industries and exploitation of new economic opportunities. The big spender nations, when it comes to R&D, tend to be among the most prosperous.

Malaysia is an excellent case in point. Here at home it is no coincidence that between 2000 and 2012, gross domestic product (GDP) per capita grew from US\$4,000 to almost US\$10,800 as national R&D investment rose from 0.5 to 1.26 per cent of GDP.

And, while economic headwinds due to a major dip in commodity prices have caused a pause in the growth of R&D funding in some countries, Malaysia included, it is important for all nations to invest more. Malaysia aims to achieve R&D

intensity of at least two per cent by 2020, recognising the importance of this investment to our wellbeing and future sustainability.

Malaysia extends its welcome and highest support to the GRC's efforts to maximise the effectiveness and

efficiency of research collaborations and capabilities at the regional and global levels.

↳ [zakri@pmo.gov.my](mailto:zakri@pmo.gov.my)

**The writer** is science adviser to the prime minister

**Countries are in a race to keep up** or risk being left behind economically. This is evidenced by a **surge in research and development investments in recent years.**