

# R&D in India: Towards the 2% Goal

CTIER-CII Roundtable Discussion

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# Highlights from the Discussion

## Section I: A Snapshot of R&D in India

India was one of the earliest investors in R&D. Thirty years ago India spent more on R&D than countries with similar levels of GDP per capita. Over the last 20 years, there has been relative stagnation in the level of spending on R&D (as percent of GDP).

The Central government still accounts for the bulk of R&D spending in India.

Innovation in small firms may not be effectively being captured. A 2013 World Bank cross sectional innovation survey of 3000 SME firms in India found that 70% of the firms claimed to have introduced some kind of product or process innovation.

Many countries that started behind India with respect to their total R&D investment scenario many years ago have since moved ahead of India largely due a dramatic increase in R&D spending by firms - in China more recently, but before that in Korea, Taiwan.

Aspiration is to hit the 2 percent Goal for R&D expenditure as percent of GDP – of which 1 percent is by Industry and 1 percent by the government.

Indian companies are missing from top global R&D sectors by expenditure - sectors such as Technology Hardware & Equipment, Electronic & Electrical Equipment, Aerospace & Defence and Health Care Equipment & Services.

India has the pieces – there needs to be an integrated perspective. If one had to pick a field where India should be allocating a very large share of total national public research spending - it is health. Not only because of the problems India faces, but also because it has an existing industrial base and a world competitive pharma industry.

## Section II: What is the nature of R&D in India?

In recent years, technology purchase expenditures for India have increased much faster than R&D expenditures. India is also an important source of R&D services to companies outside.

In the Chemical sector, India appears to have done well in improvising on existing technologies, but has been a laggard in creating any game changing technologies or radical innovations. In the IT sector it was found that part of the spending on innovation was to address existing businesses and a part of it was on platforms that were extensions of existing businesses as well as completely new businesses.

Having an innovation evangelization layer is an interesting practice followed by some of the IT firms. This is a listening function for market needs, customer needs, strategy etc. which binds people in research, development and innovation.

## Section III: Industry – University Collaborations

Efforts need to be made to improve the research being done in the public research system in India and connect internationally competitive firms in sectors like IT and pharmaceuticals with the public research system.

A State's investment into the university system produces trained researchers that could go on to do relevant work for industry. The country's research ecosystem benefits as future researchers

are being trained alongside the nation's best existing researchers in an apprentice-journeyman system.

#### **Section IV: Benchmarking Competitiveness**

The number of commercialized patents is seen as a measure of effectiveness of R&D.

Examples of benchmarking used by Industry include setting a target for how much of the organisation's turnover should come from in-house developed products (for example the target could be 25% to 30%). This could include incremental improvements to existing products tweaked to a customer's requirements.

When ISRO's cryogenic engine was being developed, there were a series of small (and large) enterprises that were involved in its testing, design, building and doing very innovative parts and components. *Should this organisational form (of having an anchor and a cluster around it) be looked at as a mode of R&D efficacy in a country like India where resources are scarce, where the risk associated with investments and its penalties appear to be much higher?*

#### **SECTION V: IMPORTANCE OF IPR**

If large firms encourage or use the patents of smaller firms, then with the right incentives structure one can get a large number of small firms that are prone to doing much more innovative stuff to start patenting.

Patents of start-ups or those generated through a co-innovation network (used by large IT companies) are used mainly for defensive purposes, especially if the work of the start-ups is being integrated into a product of the larger company.

Patenting in India has other challenges like excessive bureaucracy eg. according to the National Biodiversity Act, any patent that requires access to a natural resource should have obtained prior approval from the National Biodiversity Authority.

Awareness among the SMEs needs to be created about other forms of IP like design rights, copyright, trademarks etc. Copyright is a very powerful IP because it is available for a long time.

#### **Section VI: Influence of Macro policies and schemes**

The interaction between industrial policy, trade policy, IPR policy etc is complex. It is important to ensure that they are consistently moving in a particular direction that creates some degree of contestability in the market.

There are a number of schemes that the government has floated. There is a general lack of awareness of the various schemes. Companies do not find the schemes necessarily user friendly and have also found issues with the eligibility criteria laid down in these schemes.