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EDITORIAL

Budget Reflections

The annual budget is presented invariably on 28 February, a date that coincides with National Science Day, which celebrates C. V. Raman's historic discovery of the effect which bears his name. Science is inevitably overshadowed, the morning after, when the press pronounces whether the budget was a dream or a nightmare. Economists appear on our TV screens, often repeating whatever they had said in previous years. The Sensex moves up or down, a measure of approval or disapproval of the Finance Minister's complex act of juggling the figures. For a brief moment everyone is alerted to the perils of excessive government spending and the need for fiscal responsibility. The public (that large formless body whose reactions are captured in interviews of a few people and then extrapolated) is largely interested in personal taxes; a good budget is one where the relatively affluent tax-payer pays less to the exchequer. Excise duties are also watched with some interest; the prices of common goods being linked to budgetary policy. In the days preceding the budget, the Finance Minister (often, though not always) meets with groups which represent various sections of the economy, industrialists prominent among them. Science and technology (S&T) is also one of the 'interest groups' and invariably the plea is for greater investment in S&T. Representatives of industry argue for greater tax concessions for expenditures in research and development. The pre-budget meetings are usually a case of everyone 'asking for more' from the Finance Minister's plate; for a brief moment even the rich and the powerful resemble Oliver Twist. The Minister and his aides are usually affable and receptive; secure in the knowledge that budgets can rarely be influenced by last minute pleas for concessions. The consultative process having been served, everyone waits for budget day, which is one of the rare days when a long speech can be made (and possibly heard) in Parliament, without significant interruptions. This year, Mr Chidambaram's speech was made in the backdrop of the state elections in Bihar, Jharkhand and Haryana and the inevitable political confusion that followed. Politics and the budget drove Science Day completely out of the newspaper pages on the following day. Even the announcement of the India Science Award (the country's newest and most prestigious recognition of scientific achievement) to C. N. R. Rao did not merit a mention.

There was no mention in most newspapers of President Abdul Kalam's long speech devoted to science and technology. Ironically, but happily, the Finance Minister put science on the pages of the newspapers, by announcing a special grant of Rs 100 crores to the Indian Institute of Science (IISc), Bangalore.

IISc, which has been my home for over three decades, is one of India's oldest research institutions. Approaching its centenary in 2009, the institution ranks as the foremost centre for research in science and engineering in this country. A quiet and conservative institution until the 1960s, IISc has grown dramatically in size and the breadth of its scientific activity over the past thirty years. Its character, which blends the ambience of a university with the advantages of a research institution, has helped IISc to maintain a steady level of academic performance, even in difficult times. In announcing this special grant Mr Chidambaram raised the bar of public expectation: *'Government believes that investments in institutions of higher education and Research and Development organizations are as important as investments in physical capital and physical infrastructure. What we need are world class universities, and we must make a beginning with one institution. We must have a university that will be ranked alongside Oxford and Cambridge or Harvard and Stanford. I am happy to inform the House that we have selected the Indian Institute of Science, Bangalore, which enjoys a high reputation as a center of excellence in research and development. We shall work to make IISc, in a few years, a world class university. I propose an additional sum of Rs 100 crore as a grant for this purpose.'* Budget speeches often provide Finance Ministers an opportunity to philosophize or display their tastes in poetry; this year was an exception leaving the press with enough place to highlight this focus on higher education and research. The reactions appeared quickly enough. Editorials in the Bangalore papers termed Mr Chidambaram's generosity as a boost for science in the 'information technology capital' (*Indian Express*, 2 March 2005); implicitly differentiating between scientific research and the IT boom, which has not really required frontline research as a fuel. The editorial was quick to note that, 'it would be foolhardy to believe that the Rs 100 crore grant is enough financial fuel to speed rocket IISc into the top

10 bracket where universities of Oxford and Harvard, Stanford and the Massachusetts Institute of Technology figure'. Another commentator noted thoughtfully: 'One of the attractive features of Mr Chidambaram's fourth Budget is the way it reflects the sense that India can now raise its sights. There is the Rs 100 crore provided to the Indian Institute of Science so that it can match the best universities in the world... But the budget of Harvard ...is in many multiples of Rs 100 crore. Harvard hopes to raise \$5 billion (Rs 22,000 crore) as additional money to fund its own reform program and already has an endowment of \$22.6 billion (Rs 100,000 crore!). This is not to argue that all costs are comparable, they are not, and the rupee will go much further than the dollar... But the gap remains vast. And the non-financial elements of institution building are even more important than money. Still, it is good to benchmark against the best in the world, like India's best companies now do' (T. N. Ninan, *Business Standard*, 5/6, March 2005). But, not all reactions were favourable. There were letters in the correspondence columns which noted, with some degree of justification, that a substantial proportion of IISc's alumni drifted irreversibly to the West. Should not the alumni make a greater financial contribution to the institution and the country that had provided them a wonderfully subsidized education? This is an oft-repeated criticism that has been levelled at the IITs and, at times, also at IISc. The only defence is that a significant fraction of the alumni have contributed very substantially to many spheres of national development. It is also likely that as a new thrust is provided to the scientific enterprise in India and industrial R&D moves into higher gear there will greater and more attractive employment opportunities for highly qualified scientists.

This year's budget has also provided a significant increase in the outlay for the various science departments: 2005–2006 (2004–2005), Rs crores, Department of Atomic Energy (R&D) 872 (704); Department of Space 2800 (2400); Department of Biotechnology 445 (310); Department of Ocean Development 340 (200); Council/Department of Scientific Industrial Research 846 (650); Department of Science and Technology 1250 (900). These amounts are still small when compared to countries with which we measure ourselves, like China. Nevertheless, there is a clear 'expression of intent' to drive the engine of science into higher gear. The figures projected in the US budget are, of course, staggering. A total figure of \$132 billion in 2005, includes \$28.6 billion for the National Institutes of Health and \$5.4 billion for the National Science Foundation (*Science*, 2005, **307**, 832). India can afford only a limited investment in many sectors and this must be made to go a long way. One of our most optimistic protagonists of science noted sometime ago: 'Our overall S&T budget in 2002–03 was less than \$3 billion. Pfizer's R&D budget

was over \$5 billion. For a national budget that was smaller than the budget of a single company, India has achieved so much' (R. A. Mashelkar, Convocation Address, Delhi University, 2003).

Increasing investments in science and technology place a great responsibility on the scientific community. IISc, as the guinea-pig in this experiment, will be clearly expected to raise its level of academic performance. Money is only one ingredient in scientific success. An ambience which challenges and demands a high level of faculty and student performance is undoubtedly essential to raise the standards of academic output. It must not be forgotten that the best universities can also be the most demanding; rarely condoning shortfalls in research or teaching. In India, it has become easy to camouflage academic non-performance by strenuously citing financial and administrative difficulties. It is not uncommon to see major facilities underused, with little effort to raise the level of technical competence which is necessary for much of modern day research. Scientists need to be more conscious of their responsibility in contributing to a collective enterprise of enhancing institutional performance. The importance of collaboration and cooperation is clear; enlightened self-interest points to the advantages of collaborative efforts. Even in basic research it should be possible for some groups to define some 'overarching objectives' (a phrase I heard in a recent meeting), which if even partly achieved can provide a stimulus for greater performance. Indian institutions do not generally worry about voluntarily raising the bar on performance. They do not also indulge in planning for the future. The government provides a convenient whipping horse which can be blamed for most ills. This situation is a marked contrast to that which prevails in the West. Harvard, which has so influenced Mr Chidambaram, is in the midst of a major plan to 'overhaul the university'. The plan for change is intended 'to move science center-stage in an institution that, although diverse, has traditionally enjoyed particular pre-eminence in the humanities' (H. Pearson, *Nature*, 2005, **433**, 190). This ability to constantly examine and reexamine institutional functioning and performance is one of the West's greatest assets.

The 2005 Budget signals a renewed public commitment to higher education and research in science and engineering. Mr Chidambaram's grant to IISc challenges the institution to raise its level of performance. In a flight of budgetary rhetoric the Finance Minister has raised visions of a new Harvard of the East. Comparisons can tell us how large and unbridgeable the gulf can be and Mr Chidambaram surely knows this. However, raising the bar and raising it high can certainly be a powerful catalyst for improvement.

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