EMBO reports

editorial

Who pays the piper…

Comparative figures let us know how we are performing. For a journal such as this, for instance, an initial Impact Factor of more than 6 shows that we are on the right path. For politicians, opinion polls tell them how the public perceives their performance. The latest economic data allows economists to proclaim if we are heading into or out of a recession or if we are overheating through inflation. Recently, a new figure, the expenditure on Research and Development (R&D) as a percentage of GDP has gained some importance in the political and economic realm, as well as in academic circles. Since it directly concerns science, we should take a look behind these figures to see how they may affect our lives in the laboratory.

Some years ago, I was a member of a council to develop science policy in Ireland, and I was very surprised to learn that the money a nation reports on R&D spending comes from a pot into which all sorts of unrelated ingredients are poured: building costs for research institutes, staff costs at all levels in the R&D chain, hospital laboratory costs, some clinical services, grants to industry to stimulate their research, costs to promote R&D, etc. And, in reality, the list is even more heterogeneous, since the R&D spending is open to inventive interpretation. In some countries, defence-related research is a large part of the national R&D spending; elsewhere, environmental protection, alternative energy sources, or consumer protection have become growing elements. It is thus little wonder that money from the EC's Framework programmes contributes to only 4–5% of national R&D expenditures, given that the national figure includes all the infrastructure costs as well as many others that are far removed from the bench. However, as reported recently, the EC's money is spent directly on research, so the more accurate contribution of the Framework programmes is closer to the level of 24% of funding for R&D projects and has thus become a major influence on research performed nationally.

Whatever the use of R&D spending, the money generally comes from two major sources: the Government Expenditure on R&D (GERD) and the Business Expenditure on R&D (BERD). The latter is generally self-reported and based on the accounts of the company. As there are always some uncertainties as to where to draw the line between development and innovation in production, the expenditure that managers report as R&D may thus vary depending on the company's tax and image particularities. Thus, BERD is a relatively soft number if the government does not monitor it carefully. To get a feel for the possible consequences, it is interesting to note that, in the USA, 68% of the R&D comes from BERD and that 98% of this is spent in-house, according to the latest analysis from the National Science Foundation.

The recent focus on the R&D figure in Europe has been steadily increasing with the growing realisation that the success of other economies seems to be related to their strength in the high-tech arena. Indeed, if there is little BERD and little GERD, then it is illusionary to expect anything other than an agrarian economy. The heads of the European states reacted to this growing awareness and stated in 2000 that Europe will become the leading knowledge-based economy. This was followed in 2002 by the proclamation of the intention to reach a level of 3% expenditure on R&D by 2010. In 1998, this figure for the EU was at 1.81%. The increase to 3% might seem like a tall order for some member states of the EU—only Finland and Sweden are already above that target—but for the fact that 60% of this money should come from industry.

What will be the consequences of focusing on this indicator? Clearly, we in Europe should expect an apparent increase in money spent directly or indirectly on R&D. Given the plan that a lot of this will come from industry, and presumably be spent within industry, the result may be a greater emphasis on the D rather than the R part of the duo. Speaking to colleagues in Sweden, my expectation that their 3%-plus world is a heaven for scientists was shattered with tales of no real increase in their budgets and of increased targeting of government funds towards strategically important areas—'strategically' meaning 'beneficial to industry'. So we should not delude ourselves. Governments spend money in order to create benefits for society, not to indulge the scientific community. Each dollar/Euro spent in the GERD category must result in a direct or indirect economic pay-off; the same is true of the BERD.

It follows that we scientists must deliver measurable benefits. We can reasonably argue that fundamental research has a record of finding new avenues that open rich possibilities for the industrial sector. But this argument must be constantly reinforced with examples of success. We have reached a cost that far surpasses that of a national orchestra or ballet company, and with this comes the need to perform even more spectacularly. 'Who pays the piper calls the tune'. Today, the piper is, to a very large extent, industry and the governments responding to the perceived needs of industry. Even when high-tech business demands more R from the academic sector, it is unfortunately a trend that government funds tend to focus close to D, which means applied research. We scientists have reacted to this development and become part of the extended industrial enterprise, a small cog in a large machine. Research institutes and universities vie to prove their worth as drivers of new start-up companies, and their finances are increasingly linked to their success in establishing new industries. So are national research funds. So are funds from EC Framework programmes. We have become a part of this world, and we should be aware of the subtle changes in the tunes we are playing in response to our paymasters.

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