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Goals-based R&D policy: high popularity, low effectiveness – What is the likelihood of the UK reaching its target of spending 2.4% of GDP on R&D by 2027?

15 March 2021

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A few days ago, the head of UK Research and Investment, Professor Dame Ottoline Leyser, said the Government's target of having 2.4% of GDP spent on research and development (R&D) by 2027 was ' [very challenging](#) '. Here, Adão Carvalho of the Department of Economics at the Universidade de Évora in Portugal considers the poor record of such past R&D targets around the world and the necessary conditions for success. The author may be contacted at: acarvalho@uevora.pt .

Nowadays, many countries around the world set research and development (R&D) intensity

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goals – in the form of Gross Expenditure on R&D as a percentage of GDP – as an essential element of science, technology and innovation plans.

All European Union countries and all but a few OECD countries have set R&D intensity goals. This common practice might lead us to imagine that we are in the presence of a proven policy to raise a country's global R&D expenditure to a desired level of GDP.

But [that is not what a recent study of mine has shown](#) .

In fact, achieving the set R&D intensity goals is more the exception than the rule: **67% of all cases studied missed the target by -40% to -100% and another 17% by more than -100%** (in other words, their R&D intensity decreased over the period).

One wonders whether this paradoxical situation is the result of bad policymaking or the fact that the task at hand is difficult to accomplish. It is likely a combination of both.

To understand the rationale for setting R&D intensity goals, it is important first to establish the relationship between R&D, knowledge, innovation and economic growth in a somewhat linear fashion. A major output from R&D activities is new knowledge – scientific and technological – and innovation is the practical application of new or existing knowledge, which in turn leads to economic growth. However, economic growth is only partially explained by innovation and R&D is just one of the many sources of innovation.

Many countries see innovation as a key to achieve higher levels of efficiency and competitiveness, and thus are increasingly dependent on the production and fast access to existing knowledge, which is becoming more complex. All advanced economies invest large amounts of money in R&D activities with the aim of increasing the stock of knowledge, keeping up with advances in knowledge and producing innovations.

Improving innovation and economic growth is a major concern of governments and they promote expenditure on R&D as a means to achieve that end. By setting R&D intensity goals, governments express their belief in R&D as a main driver of progress and change in a knowledge-based economy. It represents the awareness about the importance of knowledge in today's competitive environment and the understanding by policymakers that a country needs to reach (even overcome) a certain level of R&D expenditure (as a percentage of GDP), particularly the business sector (BERD) but also universities (HERD) and other R&D performing sectors.

By setting R&D intensity goals, governments take a leading role in encouraging R&D expenditure, including business R&D expenditure, and commit themselves to reaching a specific R&D goal in a specific time frame. While setting specific goals shows determination of policymakers, it may also put them in an uncomfortable situation because it is easy to assess the effectiveness of the policy, particularly when policymakers do not directly control variables (like BERD and GDP) which are critical to reach the set goals. R&D intensity goals are, thus, the result of a combination of the country's specific commitment to increase R&D expenditures and the government's wishful thinking.

The high popularity of R&D intensity goals among the most advanced economies is not an indicator of a successful policy or the countries' success. As we've seen above, the effectiveness is rather poor. Governments set R&D intensity goals for different reasons, including:

- using it as a flag for science, technology and innovation plans;
- a desire to reach the level of R&D expenditures of leading countries;
- the simplicity of the indicator; and
- its ease of use for international comparisons as well as for other strategic and political reasons.

A number of factors might explain the failure to reach the set goals, some are related to the way the goals are set and others are related to the [economic essentials to raise R&D expenditure](#), including the characteristics of the industry (more or less R&D intensive), the R&D infrastructure, the number of skilled researchers (in industry and academia), incentives for firms to invest in R&D, and the type and amount of public R&D incentives.

Since governments do not have control over the evolution of BERD and GDP, it seems surprising that so many countries choose to set specific, long-term R&D intensity goals instead of more manageable goals like increasing R&D expenditures by a given percentage or amount annually.

Even more surprising is the fact that some governments set to reach moving R&D targets like the OECD average for R&D intensity.

It is reasonable to think that R&D intensity goals are set taking into consideration an ex-post study of past failures or an ex-ante projection of the evolution of R&D, but neither seem to occur in most cases. Some countries want to rank among the top performing countries, others set goals according to the average R&D intensity of the group of countries in a comparable stage of development, still others choose to reach the 3% goal, a kind of magical number that was first set in the 1960s and used ever since.

In the UK, the 2017 Conservative Party election [manifesto](#) stated: ‘We will deliver this and ensure further growth so that overall, as a nation, we meet the current OECD average for investment in R&D – that is, 2.4 per cent of GDP – within ten years, **with a longer-term goal of three per cent**’. Two years later, Labour’s election [manifesto](#) stated: ‘Labour will create an innovation nation, setting **a target for 3% of GDP** to be spent on research and development (R&D) by 2030.’

The European Commission has set a 3% goal (2% for the business sector) for the EU as whole and most of the EU countries have followed suit. Perhaps the most negative factor

contributing to the low effectiveness of this policy has to do with the growing practice of setting completely unrealistic goals, turning R&D intensity in goal itself. Many goals are set for a period of time longer than the political cycle and the degree of commitment of policymakers to the objective may change.

In conclusion, the low effectiveness of the goals-based R&D policy suggest that **policymakers should review the way they use this indicator to promote innovation and economic growth. Unrealistic goals put at stake the indicator and the credibility of the policy and the policymakers behind it, but the problem lies in the commitment of governments not in the importance and usefulness of the indicator** .