MEASURING DEFENCE R&D: A NOTE ON PROBLEMS AND SHORTCOMINGS

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(Received November 30, 1998)

Defence R&D continues to account for a very substantial share of many countries' research effort, often retaining or even increasing its role within the national innovation systems. Yet the quantitative analysis of defence research efforts and their impact is impaired by difficulties in defining defence R&D. The article studies these difficulties and focuses on the issue of identifying what constitutes, does not constitute, defence R&D. It finds that the OECD approach of defining defence R&D on the basis of the primary goals of the research is inadequate, particularly in the present context of the growing emphasis on dual-use technologies and research. It then analyses alternative approaches that could provide a more solid grounding for any systematic effort to collect international defence R&D data.

Introduction

Despite the reduction in defence expenditures, and the lower profile given to defence-industrial issues after the end of the Cold War, the effort invested in defence related research and development (R&D) continues to be very significant (Serfati 1998, Molas-Gallart et al. 1998, Hagelin and Reppy 1998, Gummett and James 1998). The role of defence research continues to be particularly important in countries at the forefront of military technology development (United States, France and Britain). In the US, DoD outlays in R&D have fluctuated in current terms around a stable trend (Hagelin and Reppy 1998). In Japan Defence Agency research budgets have remained stable, with small annual increases in current terms only interrupted in 1998 when for the first time over many years, current expenditure in R&D suffered a decline, albeit of a small magnitude. In contrast, French public expenditure in defence R&D has fallen sharply: by a third since 1990. It must be noted however, that even after this decline, present defence R&D remains at the same level of the mid 1980s (Serfati 1998).

Even in countries with smaller defence industries and less developed defence industrial bases, defence research is retaining or even increasing its role within the
national innovation systems, despite the change the military environment has experienced since 1989. Overall stability is the trend in the Netherlands, with R&D accounting for about 1% of the total defence budget, and remaining stable (Smit 1998). In Spain, defence R&D has sharply increased over the last two years and is now reaching (if we believe available statistical data) unprecedented levels of investment.

A proper understanding of the role of defence-related innovation is the key to grasping the main patterns and determinants of technological innovation as we move into the 21st Century. Moreover, the relationship between defence-related and civilian innovation is changing, with defence production and research becoming increasingly intertwined with civilian activities. In the fields of innovation and technology the separation between what is military and what is civilian has never been straightforward, and is now rapidly becoming much more difficult.

Analysis of the role of defence funding on technological innovation has been long hampered by the lack of reliable and systematic data. Any cross-national comparison or longitudinal analysis of defence R&D investments has to be approached with great caution: no degree of analytical sophistication and quantitative techniques can make for shortcomings in the original data.

The development of solid data has long been a concern to analysts. This is widely recognised as an important task, not only by students of the defence industries, but also by all those interested in the patterns and evolution of technological change. The “Frascati Manual” for instance, states that “the distinction between military and civil R&D is considered one of the most important functional breakdowns of national R&D efforts” (Organisation for Economic Co-operation and Development 1994, p.25).

However, there has been a scarcity in the quality and quantity of data available to the researcher. Evidence from OECD countries confirms the continuing disparity of nationally-based data sets, and the difficulties of building a reliable series of defence innovation indicators covering a number of countries. The OECD itself is today the only stable source of comparable national data on defence R&D; and it is obviously limited in its geographical reach to member countries. Even more important as this paper will show, the definitions of defence R&D on which the OECD bases its statistical work may lead to inaccurate estimates.

This study focuses on the shortcomings of present measuring tools and the difficulties inherent in improving data collection. Many of the problems have been known for decades. Yet despite recurring discussion within academia, defence agencies and international organisations, improvements in data collection, where they have occurred, have usually been implemented only at national level. Present changes in the structure of military production make it more difficult for reliable estimates to be