

## The Influence of Government Support for Civilian R&D on Israeli Industry



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Israel is relatively poor in natural resources and must therefore invest in its primary asset, human resources. All indicators point to the fact that both the private and public sectors are working in this direction. The national expenditure for civilian R&D in Israel reached 4.6% of GDP. This is the highest rate for the industrialized world where the OECD countries averaged, in 2002, slightly more than 2% of GDP<sup>1</sup>.

Israel's position is even more remarkable when one considers that the Government's portion in R&D expenditure is 39% as compared to 12% for the OECD countries<sup>2</sup>.

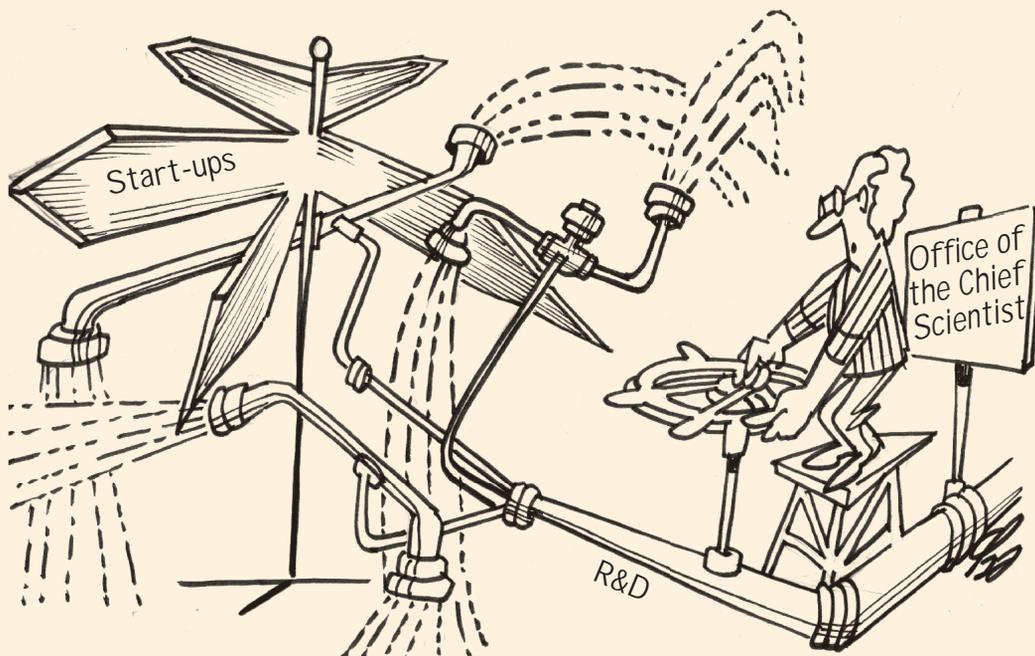
The Office of the Chief Scientist (OCS) of the Ministry of Industry, Trade and Labor is responsible for the execution of government policy for industrial R&D support. The primary objectives of the OCS are to aid in the development of new technologies as a means for strengthening Israel's economy, to encourage technological entrepreneurship, to develop the pool of human resources in Israel and to promote R&D cooperation on a national and international level.

Prof. Morris Teubal of the Hebrew University in Jerusalem claims that in the area of public support for civilian R&D each country must establish a multifaceted program of support that will be appropriate for its different types of companies. He calls it the 3P policy – Program, Portfolio, Profile<sup>3</sup>. The OCS runs

a myriad of programs of aid and support for R&D that is designed to provide support at various stages of the R&D process. The "Tenufa", "Technological Incubators" and "Heznek" programs help the starting entrepreneurs and nascent companies. The "Magnet" program supports generic R&D of various corporate consortia and the "R&D Fund" supports competitive R&D.

In the age of globalization, the OCS places great importance on international R&D cooperation and operates both at bilateral and multilateral levels. At the bilateral level, Israel established five bi-national funds for industrial R&D, with The United States, Great Britain, Singapore, Korea and Canada. In addition, Israel has agreements with more than ten countries for mutual support of joint R&D projects. Recently agreements have been signed with state regions as well as multinational corporations. At the multinational level, Israel is part of the European Eureka and FV-6 programs.

In the past year the OCS has decided to give preference to biotechnology and nanotechnology, in recognition of the fact that these areas will be in the forefront of technology in the near future and with the understanding that relatively large resources will be



needed for developments in these fields. To this end, a dedicated incubator for biotechnology was established in Jerusalem along with the Russell Berrie Institute for Nanotechnology at the Technion.

Numerous academic studies have shown that government support for civilian R&D is an important growth engine for established and new companies as well as a significant promoter of Israel's unique entrepreneurial spirit. According to a model suggested by Prof. Avi Feigenbaum of the Technion, the Government support for R&D (risk sharing and creating a base for entrepreneurs) along with providing the infrastructure for the establishment of new companies ("Tenufa" program, Technological Incubators" and "Hezrek Fund") are two of the five primary causes for the explosive growth of Israel's high-tech sector in the 90's.

Israel's high-tech sector is a significant contributor to its economy. It represents one third of its industrial production. It represents an even greater portion of Israel's exports, 46% for 2004 (not including diamonds)<sup>4</sup>.

In the past five years, on average, 1500 to 2000 applications per year were submitted for R&D support in one of the OCS programs. The requests were received from 598 companies that represent the backbone of the high-tech industry in Israel. Of these, 58 were start-up companies, 82 were veteran companies that applied for the first time, and the remaining 458 companies<sup>5</sup> were repeat applicants for R&D support.

In the first quarter of 2005, there were 1273 start-up companies in Israel, all in various phases of product or technology development. The OCS is justifiably proud of the grants it provided to these young companies within the framework of its various operating programs. The following represent some of the success stories:

**1.** Sabflex Ltd., with aid via the "Tnufa" program completed the development of a unique system for fish farming in the open sea. The basic idea is the subject of a novel patent and is based on a flexible system where a "submarine" is anchored to protect it from the elements. This is the only system in the world that meets the most stringent ecological criteria as promulgated by the Greenpeace Organization.

**2.** Compugen Ltd. and IRLan Ltd. represent two of the successful graduates of the "Technological Incubator" program of the OCS. The former is active in the area of bio-informatics and is developing drugs and diagnostic products through a multidisciplinary use of mathematics, physics and computer science and their integration with biology, organic chemistry and medicine.

**3.** Ki-Bi Ltd. is developing smart cards that will provide content and services to mobile phones. The initial investment in the company was provided in parallel by the "Hezrek Fund" and Germany's Siemens Corp.

The "Magnet" Program that supports various consortia in generic

R&D has also provided a significant contribution to industry as well as the Israeli economy. For example: The consortium ISIS – the information highway in space – began its operation in 1999 and continued for five years. The leading company in the consortium was Gilat Satellite Networks. The other participants were Orbit, Shiron, Scopus, and Microkim along with research groups from Tel Aviv University, Ben Gurion University and the Technion. Among its significant accomplishments, ISIS developed technologies by which it reduced to 1/3 the cost of a terminal in the satellite tracking stations. ISIS succeeded in defining the tracking terminals of the future by means of their mobility, efficient utilization of band width, coding and operation in the newly allotted wave lengths (Ka).

The OCS utilizes its "Research Fund" for the area of competitive R&D. In 2004, grants totaling 874 million NIS were provided. The applicants for support represent most of the high-tech companies in Israel.

Since the assistance provided by the OCS to the high-tech industry is in itself insufficient to alleviate Israel's unemployment problem, the OCS has embarked upon a program for the traditional industries to adopt the concept of research and development and hereby to enter the era of high-tech. The innovations in processing and technology will improve the competitiveness of Israel's traditional industries in the world market.

For the past three decades the OCS has been one of the cornerstones of Israel's high-tech industry and played a key role in the evolution and transformation to a science and technology based economy. However, the very rapid changes inherent in a globalized economy demand a constant vigilance and rapid response to changing situations. Therefore the OCS will continue to develop appropriate and available tools for the aid and support of the Israeli industry through the maximum exploitation of its human resources that will keep Israel at the forefront of technology in the world.

<sup>1</sup> National expenditure for civilian R&D 1989-2004 – Central Bureau of Statistics – Israel

<sup>2</sup> National expenditure for civilian R&D 1989-2004 – Central Bureau of Statistics – Israel

<sup>3</sup> Teubal, M. (2002) What is the systems perspective to Innovation and Technology and how can we apply it to developing and newly industrialized economies. Journal of Evolutionary Economics.

<sup>4</sup> Foreign Trade 2004 – CBS – Israel

<sup>5</sup> This number does not include applications for support within the "Tnufa" program

<sup>6</sup> IVC Research Center