

# Media Release

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## The National Expenditure on Civilian R&D 2018

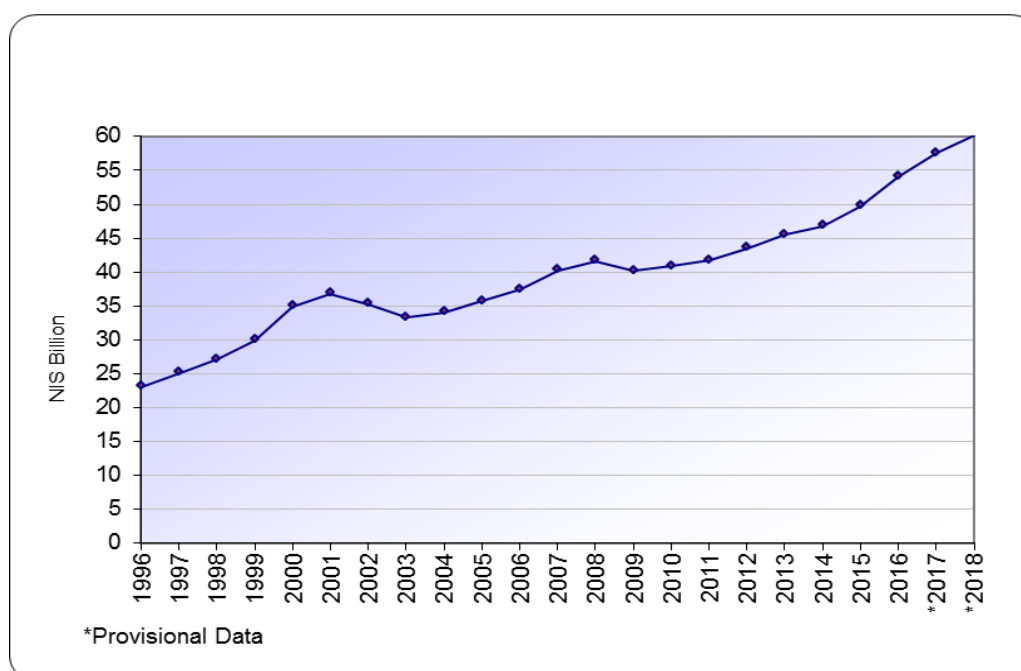
- The National Expenditure on Civilian R&D increased by 4.6% in Constant Prices in 2018.
- National expenditure on civilian R&D in 2018 amounted to NIS 65.7 billion- 4.9% of the GDP, and 4.8% in 2017.
- The national expenditure on civilian R&D per capita in Israel, in 2018, amounted to 1,973 dollars (at current prices, in PPP terms of GDP), mainly due to a high concentration of development centers of multi-national companies in Israel.
- In the Business sector, the R&D expenditure increased by 5.1%, at constant prices, in 2018, following an increase of 7.3% in 2017.
- In 2017, 52.6% of the expenditure on R&D was financed by Funds from Abroad and 35.9% by the Business sector.
- In 2018, the share of grants for the advancement of research (including GUF-Government University Funds) amounted to 55.9% and the share for advancement of industrial technology amounted to 29.8%.

### Definitions and Explanations

Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of knowledge to devise new applications.

National expenditure on civilian R&D, at current prices, amounted to NIS 65.7 billion in 2018, and comprised 4.9% of the GDP. According to provisional estimates, in 2018, the national expenditure on civilian R&D, at constant prices, increased by 4.6%, following an increase of 6.5% in 2017 and of 8.7% in 2016.

**Diagram 1- National Expenditure on civilian R&D, at 2015 prices 1996-2018\***



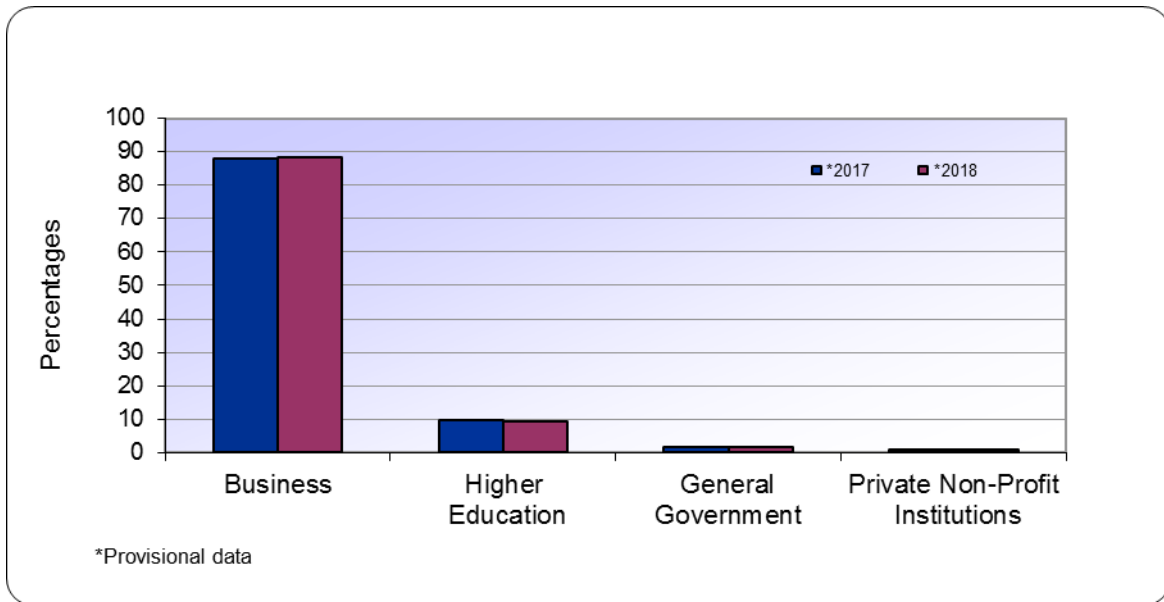
**Table 1.- National Expenditure on Civilian R&D Compared To selected Macroeconomic Indicators (at current prices)**

National expenditure on civilian R&D	2010	2011	2012	2013	2014	2015	2016	2017*	2018*
Yearly change at fixed prices	1.4	2.4	4.3	4.6	2.6	6.4	8.7	6.5	4.6
Percentage of gross domestic product	3.9	4.0	4.2	4.1	4.2	4.3	4.5	4.8	4.9
Percentage of net domestic product	4.6	4.6	4.8	4.7	4.8	4.9	5.2	5.5	5.7
Percentage of gross domestic investment in fixed assets	21.0	19.7	20.0	20.3	21.1	22.4	22.0	23.7	23.1
Percentage of gross investment in economic industries	30.2	28.2	28.9	29.9	31.9	34.0	32.8	35.3	33.1
Business Sector-Yearly change at fixed prices	1.5	2.5	4.8	5.2	2.9	7.2	10.0	7.3	5.1
Business Sector - Percentage of gross investment in capital formation	17.4	16.5	16.9	17.1	17.9	19.1	19.1	20.8	20.4

\*Provisional data

The expenditure on civilian R&D (at current prices), performed by the Business sector amounted to NIS 58.0 billion in 2017, comprising 88.3% of the total national expenditure on R&D. The remainder was expenditure on R&D carried out by Universities (9.3%), in the General government sector – 1.5% and in Private non-profit institutions – 0.9%.

**Diagram 2. National Expenditure on Civilian R&D, by Operating Sector 2017\*, 2018\***



### **Civilian R&D Expenditure in the Business Sector**

The development, at constant prices, reflects a 5.1% increase in expenditure on R&D in the business sector in 2018, following an increase of 7.3% in 2017, and of 10.0% in 2016.

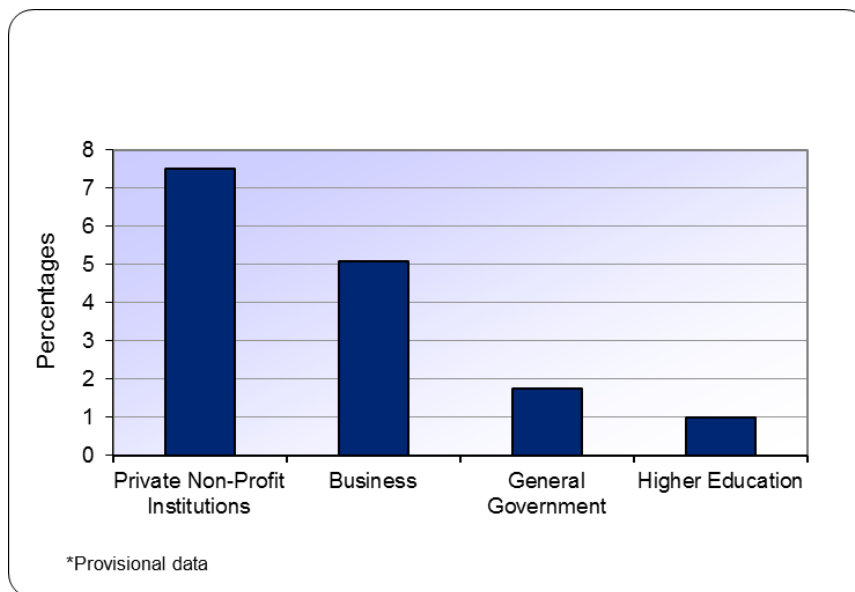
The Business Sector mainly includes: Computer programming, consultancy and related activities (Software), Scientific research and development (R&D) and manufacturing industries.

In 2017, the expenditure on R&D in Computer programming, consultancy and related activities (Software) increased by 6.2%, at constant prices, following an increase of 23.1% in 2016. The expenditure in Scientific research and development (R&D), including start-up companies, international R&D centres, technological incubators and research institutes, increased by 8.1% (at constant prices), following an increase of 4.0% in 2016. In manufacturing industries the expenditure increased by 1.6%, at constant prices, in 2017, following a decrease of 2.8% in 2016.

### **Civilian R&D Expenditure in Other Sectors**

In 2018, the expenditure on R&D in the General government sector increased by 1.8%, at constant prices, following an increase of 3.6% in 2017. In Higher education institutions, the expenditure increased by 1.0%, at constant prices, following a similar increase in 2017. The expenditure in Private non-profit Institutions increased by 7.5%, at constant prices, following an increase of 3.2% in 2017.

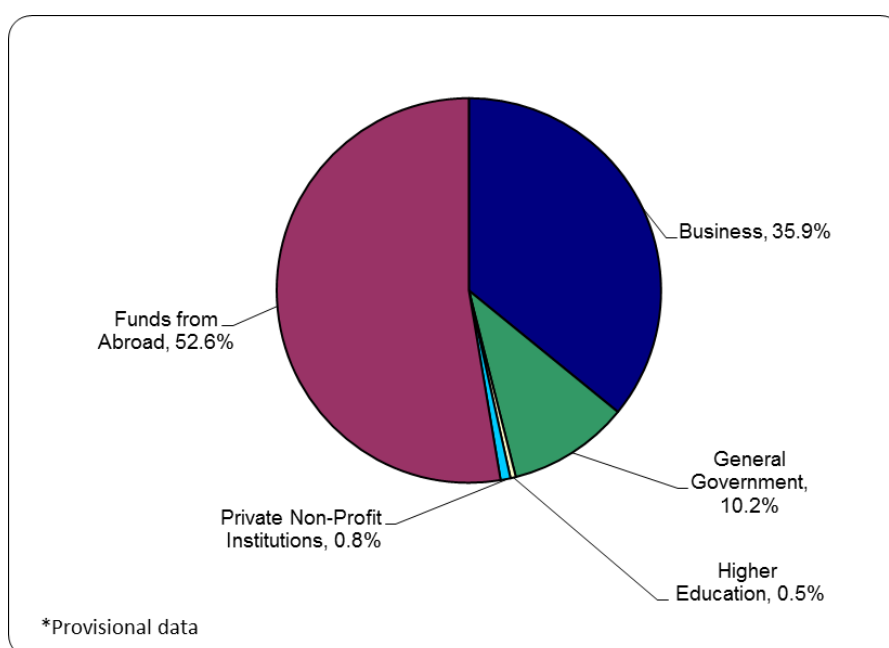
**Diagram 3. National Expenditure on Civilian R&D, by Operating Sector  
Percent Change in 2018\* Compared to 2017\*, at Constant Prices**



**The Major R&D Financing Sources – Funds from Abroad and the Business Sector**

The recent data on the distribution of financing, for 2017, show that the Business sector financed 35.9% of all civilian R&D expenditure in Israel, less than in 2016 (38.3%). Funds from abroad financed 52.6% of the civilian R&D expenditure in 2017 and 49.2% of it in 2016. The financing from abroad was allocated mainly to the business sector. The General government sector financed, mainly through transfers to higher education institutions and by self-financing, 10.2% of the expenditure compared to 11.1% in 2016. Higher education institutions financed 0.5% of the total national expenditure, compared to 0.6% in 2016. Private non- Profit Institutions financed 0.8% of the total expenditure and similar to 2016.

**Diagram 4. National Expenditure on Civilian R&D, by Financing Sector 2017**



## **R&D Personnel in the Business Sector**

In 2017, 99,712 employees have worked in research and development in the business sector, an increase of 13.0% compared to 2016 (including employees in R&D in general hospitals).

94,899 of them in full time equivalent jobs, an increase of 13.4% compared to 2016.

The distribution of employees by level of education shows that in 2017, 4.9% had a Ph.D. degree, 78.4% had first degree or master's degree, 9.9% were practical engineers and technicians and 6.8% had other education.

## **R&D Finance by Government Ministries, including GUF (General University Funds)**

Government ministries' expenditure on civilian R&D amounted to NIS 8.2 billion in 2018. The expenditure included performing of research, commissioning of research from other institutions and transfers for financing of R&D in all sectors, including General University Fund.

The distribution of the expenditure on R&D of government ministries shows that 15.0% out of total expenditure was for intramural expenditure and was mainly operated by the Ministry of Agriculture and Rural Development (74.2%). 10.3% of the expenditure on research was for purchasing of R&D and 52.6% were transfers to finance R&D performed in all sectors (including operations abroad).

Most R&D funding of the ministries, excluding General University Fund, came from the Ministry of Economy (63.8%). 25.2% of the total funding of the Ministry of Economy was allocated to the business sector.

The breakdown of expenditures on civilian R&D of government ministries, including General University Fund, by objectives shows that in 2018 the share of grants for the advancement of general research, which mainly includes the finance of the General University Funds and is oriented to the universities, amounted to 55.9%. Expenditures for advancement of industrial technology amounted to 29.8%. The main expenditure of this category were grants awarded by the Ministry of Economy to industrial companies; 5.9% of R&D expenditure, in 2018, were allocated to development of agriculture; 2.5% for research in social services - education, labor, social welfare, immigrant absorption, etc., and 2.5% of the expenditure were allocated to development of infrastructure (including research on transportation and on urban and rural planning).

**Table 2. Government Ministries' Expenditure, By Objectives, at current prices (Including General University Funds-Guf)**

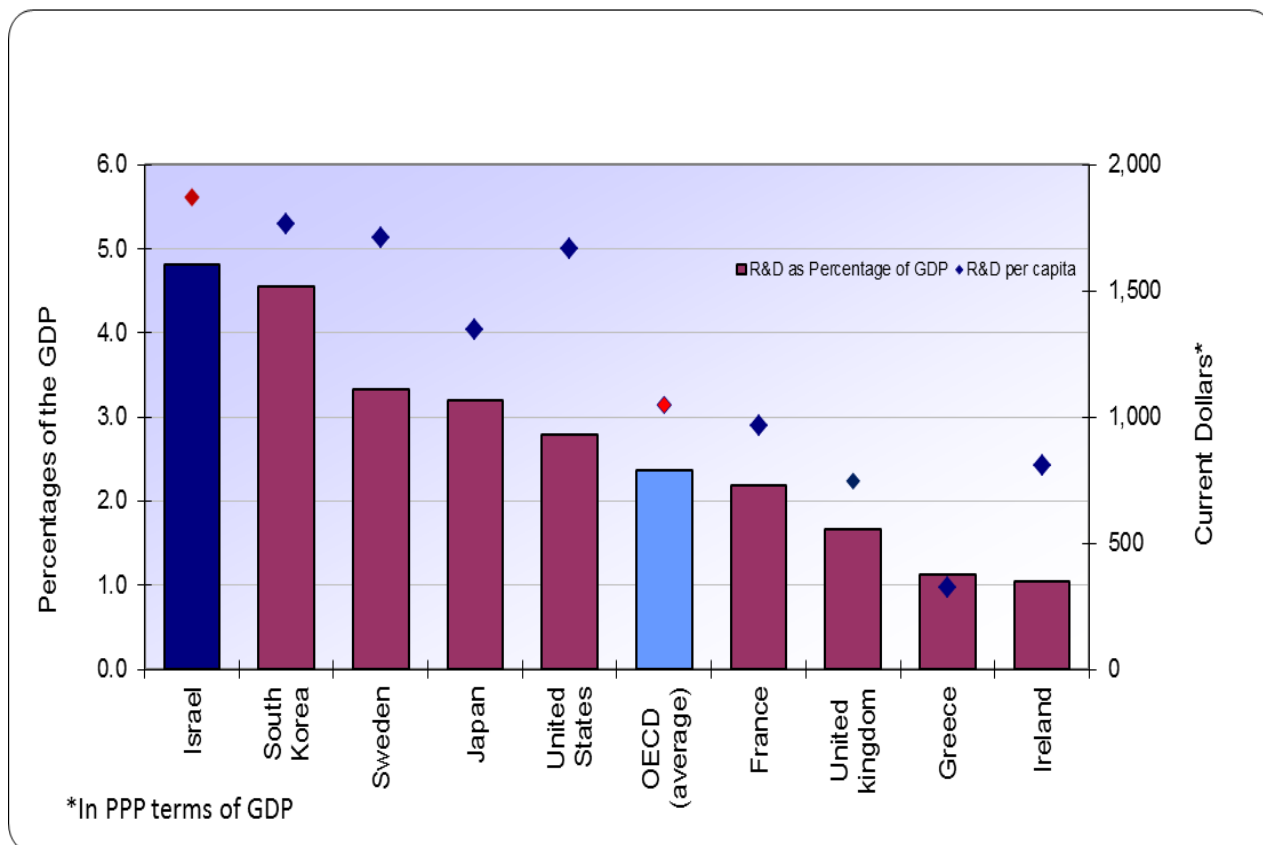
Objective	2010	2011	2012	2013	2014	2015	2016	2017	2018*
TOTAL (NIS Million)	5,391	5,802	6,257	6,474	6,894	7,211	7,567	7,709	8,232
TOTAL	100	100	100	100	100	100	100	100	100
General advancement of Knowledge (including GUF)	54	55	53	57	55	57	53	56	56
Industrial production and technology	32	31	33	30	30	29	32	30	30
Agriculture	6	6	6	6	6	6	6	6	6
Social services	4	4	5	4	3	3	3	3	3
Transport, telecommunication and other infrastructures	1	1	1	1	3	2	2	3	2
All the rest	3	3	2	2	2	3	4	2	3

\*Provisional data

## National Expenditure on Civilian R&D in Israel – Comparison to OECD Member Countries

In 2017, the national expenditure on civilian R&D in Israel, as a percentage of the GDP, was 4.8% - the highest among all OECD member countries. The national expenditure on civilian R&D per capita, in Israel, which amounted to 1,872.7 dollars in 2017 (at current prices, in PPP<sup>1</sup> terms of GDP), was one of the highest in OECD member countries.

**Diagram 5. National Expenditure on Civilian R&D -International Comparison 2017**



For additional information see:

"National Expenditure on Civilian Research and Development, 1990-2017"

<sup>1</sup> **Purchasing Power Parity (PPP):** Is a special currency conversion rate which provides a basis for conversion to a common currency and equalizing the purchasing power of different countries.

## DEFINITIONS AND EXPLANATIONS

Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of knowledge to devise new applications.

The definitions and classifications in this publication are based on the recommendations in the Frascati Manual<sup>2</sup> of the OECD for measuring expenditure on R&D, so the data on Israel are comparable to those of the OECD countries.

In the estimate of the national expenditure on R&D presented here, defence R&D was excluded. Defence R&D includes all R&D activities for military purposes, irrespective of their contents or secondary civilian applications.

The operating and financing R&D units in Israel were classified into the following sectors:

**(a) Business** – The Business Sector includes the following industries: Agriculture; Afforestation and Fishing; Manufacturing; Electricity and Water Supply; Construction; Commerce; Accommodation Services and Restaurants; Transport, Storage and Communications; Financing and Business Services; Personal and Other Services, including the general hospitals.

The Business Sector includes all establishments, both privately and publicly owned, as well as business companies which are not defined as companies, such as the Public Printer. Not included are general government services, local authorities, non-profit institutions and households.

**(b) General Government** – broadly defined, includes government ministries, local authorities, national institutions, the National Insurance Institute and non-profit institutions financed mainly by government.

Higher education institutions are considered as a separate sector because of their intensive R&D activity and the general hospitals were classified as part of the Business sector.

**(c) Higher Education Institutions** – include the following institutions and research establishments associated with them: The Hebrew University, Tel Aviv University, Bar-Ilan University, Haifa University, Ben Gurion University of the Negev, Technion – Israel Institute of Technology, Ariel University and the Weizmann Institute of Science.

**(d) Private Non-Profit Institutions** – include institutions which operate on a non-profit basis, and whose main source of financing is not governmental. R&D financing by households, such as donations, is presented together with financing of the Business Sector. The hospitals are classified as part of the Business sector and Sources of R&D funding from abroad are classified as part of Abroad Sector.

**(e) Abroad** – comprises all non-resident institutional units that enter into transactions with resident units, or have other economic links with resident units (such as claims by residents on non-residents).

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<sup>2</sup> OECD (2015). The Measurement of Scientific and Technological Activities: Proposed Standard Practice for Surveys on Research and Experimental Development. The Frascati Manual 2015. Paris: Author.

OECD (1989). The Measurement of Scientific and Technological Activities, R&D Statistics and Output Measurement in the Higher Education Sector: The Frascati Manual, Supplement. Paris: Author.



Abroad also includes certain institutional units that may be physically located within the geographic boundary of a country, for example: embassies, consulates or military bases, as well as international organizations. Expenditure of Government ministries on R&D, classified by objective, in line with the recommendations of the Frascati manual

- (a) Exploration and exploitation of the earth – R&D related to the exploration of the Earth's crust and mantle, seas, oceans and atmosphere.
- (b) Environment – R&D aimed at improving the control of pollution, including the identification and analysis of the sources of pollution and their causes and all pollutant, their dispersal in the environment and the effects on human, species and the biosphere.
- (c) Exploration and exploitation of space – All civil space R&D relating to the scientific exploration of space, space laboratories, space travel and launch systems.
- (d) Transport and communications and other infrastructures – all R&D relating to the general planning of land use. Infrastructure and land development and R&D related to transport systems, telecommunication systems, the construction and planning of buildings and water supply.
- (e) Energy – R&D aimed at improving the production, storage, transportation, distribution and rational use of all forms of energy.
- (f) Industrial production and technology – R&D aimed at improvement of industrial production and technology, including R&D on Industrial products and their manufacturing processes, except where they form an integral part of the pursuit of other objectives (e.g. defense, space, energy, agriculture).
- (g) Health – R&D aimed at protecting, promoting and restoring human health, including all aspects of nutrition and food hygiene, medical and surgical treatment.
- (h) Agriculture – R&D aimed at the promotion of agriculture, forestry, fisheries and foodstuff production. Furthering knowledge on the impact of agriculture and forestry activities on the environment.
- (i) Education – R&D aimed at supporting general or special education, including training, pedagogy and didactics.
- (j) Culture, recreation, religion and mass media – R&D aimed at improving the understanding of social phenomena related to cultural activities, religion and leisure activities and define their impact on life in society.
- (k) Political and social systems, structures and processes – R&D aimed at Improving the understanding of and supporting the political structure of society; public administration issues and economic policy; regional studies and multi-level governance; social change, social processes and social conflicts.
- (l) General advancement of knowledge
  - (1) R&D financed from general university funds – All R&D financed from general purpose grant from the Ministry of Education, through GUF.
  - (2) R&D financed from sources other than GUF – Budgets allocations that are earmarked for R&D but cannot be attributed to an objective and are financed by sources other than GUF.