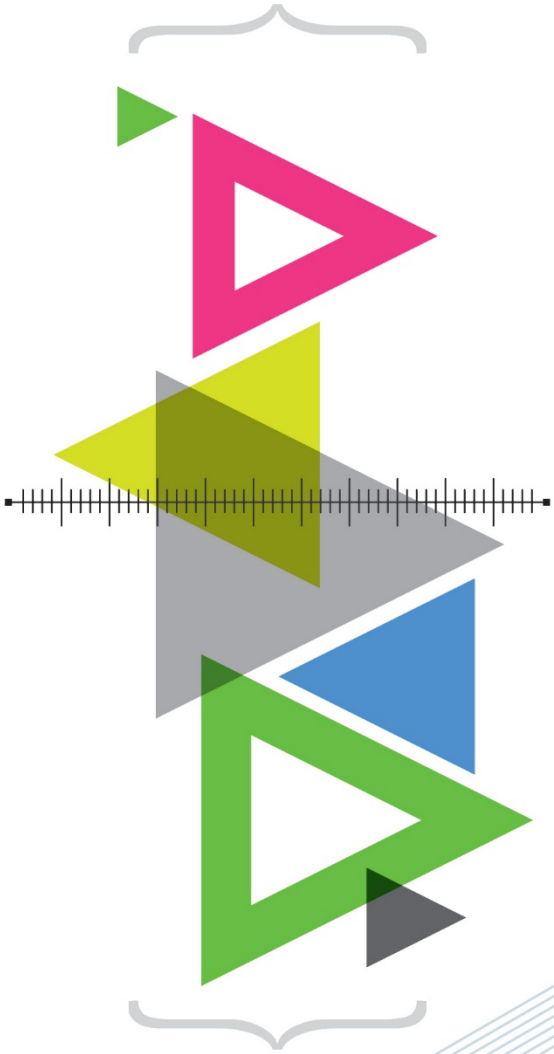

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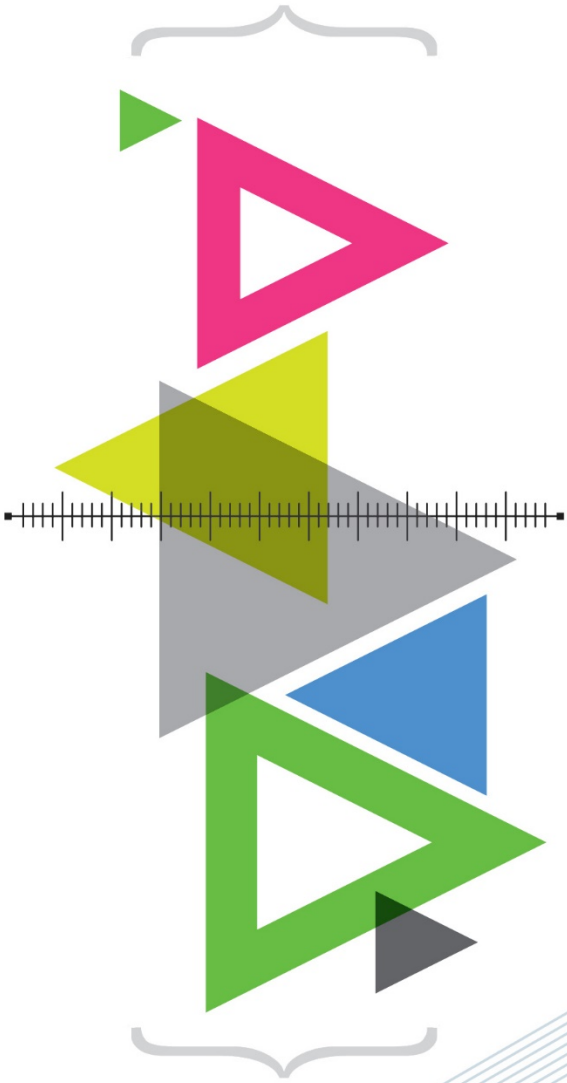
Research and Development Expenditure and Personnel in Greece in 2017 - Main Indicators

Preliminary Data



Research and Development Expenditure and Personnel in Greece in 2017 - Main Indicators

Preliminary Data

R&D statistics are produced by the National Documentation Centre, a member of the Hellenic Statistical System, with the cooperation of the Hellenic Statistical Authority (ELSTAT).

Suggested citation

EKT (2018) «Research and Development Expenditure and Personnel in Greece in 2017 – Main Indicators», National Documentation Centre

NATIONAL DOCUMENTATION CENTRE (EKT) | NHRF

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Online version is available here http://metrics.ekt.gr/en

ISBN: 978-618-5079-84-0 (print) | 978-618-5079-85-7 (pdf)

Cover Design / Infographics : Vasilis Doumanis

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1. Summary

This summary report presents the preliminary figures for the main Research and Development (R&D) Expenditure and Personnel indicators in Greece in 2017.

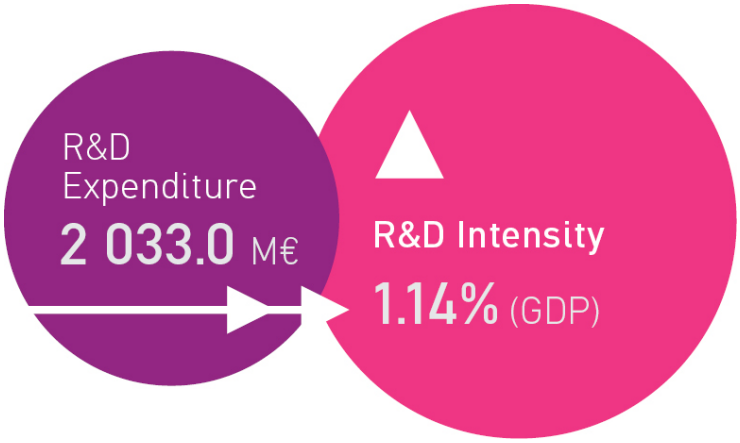
R&D statistics in Greece are produced by the National Documentation Centre, member of the Hellenic Statistical System, with the cooperation of the Hellenic Statistical Authority (ELSTAT).

Data presented in this report are the preliminary data of the main indicators that have already been transmitted to Eurostat.

R&D Expenditure

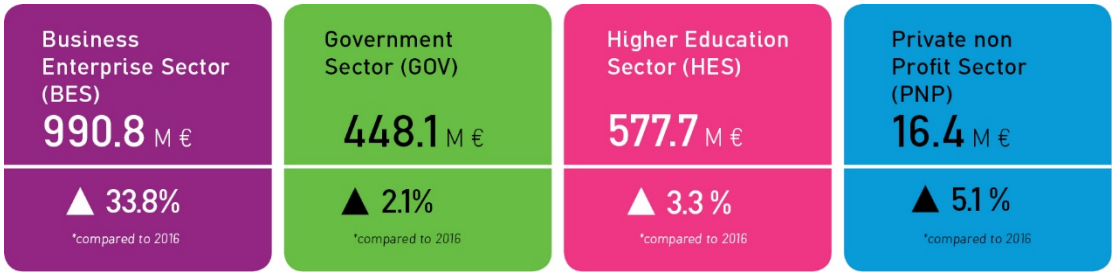
One of the five key indicators of the Europe 2020 strategy is the "R&D intensity" of a country, measuring R&D expenditure as a percentage of GDP. At a European level, the objective is to devote 3 % of gross domestic product (GDP) of EU to R&D activities. The relevant target for Greece has been set at 1.2%.

In 2017 R&D expenditure in Greece reached 2 033.0 million euro, which marked an increase of 278.8 M€ (or 15.9%) when compared to 2016. Similarly, the R&D Intensity indicator, representing R&D expenditure as a percentage of GDP, rose by 0.13 percentage points, reaching 1.14% from 1.01% in 2016.



All four sectors of performance increased their R&D expenditure. More analytically in 2017:

- In the Business Enterprise Sector, the R&D expenditure rose to 990.8 M€, which was 33.8% higher than 2016.
- In the Government Sector, the R&D expenditure rose to 448.1 M€, which was 2.1% higher than 2016.
- In the Higher Education Sector, the R&D expenditure rose to 577.7 M€, which was 3.3% higher than 2016.
- In the Private non Profit Sector, the R&D expenditure rose to 16.4 M€, which was 5.1% higher than 2016.



Source of funds

An analysis of R&D expenditure by source of funds shows that in 2017:

- Business-funded R&D stood at 910.6 M€, 29.1% higher than 2016.
- Government R&D funding accounted for 772.7 M€, presenting an increase of 3.5% when compared to 2016.

A further analysis of the sub-components of the government funds shows that in 2017:

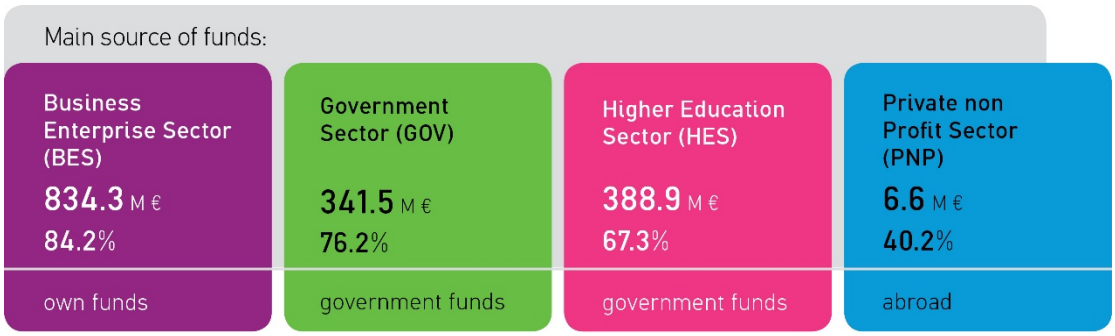
- Funds from the ordinary budget increased to 591.4 M€, a rise of 8.0% compared to 2016.
- Funds from the National Strategic Reference Framework (NSRF) decreased to 80.2 M€,

  -21.1% reduction compared to 2016.
- Funds from other sources (mainly from Public Investment Program) increased to 101.1 M€ a rise of 3.6% compared to 2016.

Regarding funds coming from abroad, the main source is the European Commission (EC) through its Framework Programmes for Research (e.g. H2020). In 2017, EC funding in Greece accounted for 215.1 M€, increasing by 3.2% compared to 2016.

In 2017, the main source of funds for each sector of performance is as follows:

- In the Business Enterprise Sector, 84.2% (834.3 M€) of the R&D expenditure was funded by own funds.
- In the Government Sector, 76.2% (341.5 M€) of the R&D expenditure was funded by government (79.4% coming from ordinary budget, 6.4% from NSRF and 14.2% from other government sources).
- In the Higher Education Sector, 67.3% (388.9 M€) of the R&D expenditure was funded by government (82.3% coming from ordinary budget, 5.8% from NSRF and 11.9% from other government sources).
- In the Private Non-Profit Sector, 40.2% (6.6 M€) of the R&D expenditure was funded by own funds.



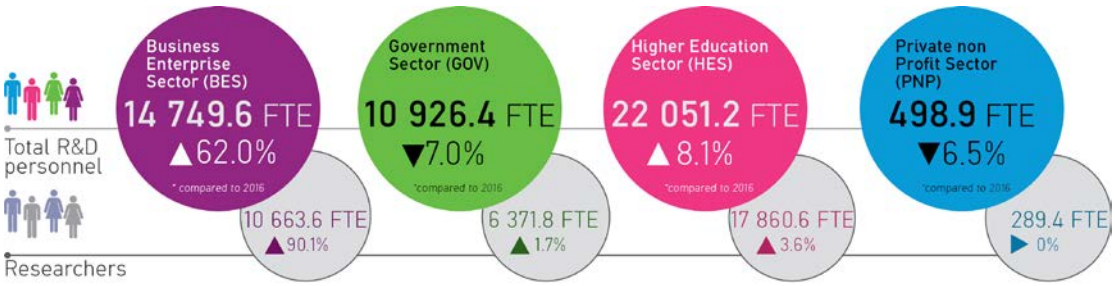
R&D Personnel

In 2017 there was also a significant increase in the R&D personnel and researchers (in full time equivalents, FTE).

More analytically, in 2017 the total R&D personnel in Greece rose to 48 226.1 FTE, which marked an increase of 15.4% when compared to 2016. Researchers was 35 185.4 FTE, increasing by 19.7% when compared to 2016.

In 2017 the R&D Personnel by sector of performance was as follows:

- In the Business Enterprise Sector, the number of total R&D personnel was 14 749.6 FTE, 62.0% higher than 2016. The number of researchers was 10 663.6 FTE, 90.1% higher than 2016.
- In the Government Sector, the number of total R&D personnel was 10 926.4 FTE, -7.0% lower than 2016. The number of researchers was 6 371.8 FTE, 1.7% higher than 2016.
- In the Higher Education Sector, the number of total R&D personnel was 22 051.2 FTE, 8.1% higher than 2016. The number of researchers was 17 860.6 FTE, 3.6% higher than 2016.
- In the Private Non-Profit Sector, the number of total R&D personnel was 498.9 FTE, -6.5% lower than 2016. The number of researchers was almost unchanged when compared to 2016 (289.4 FTE in 2017).



2. R&D Intensity

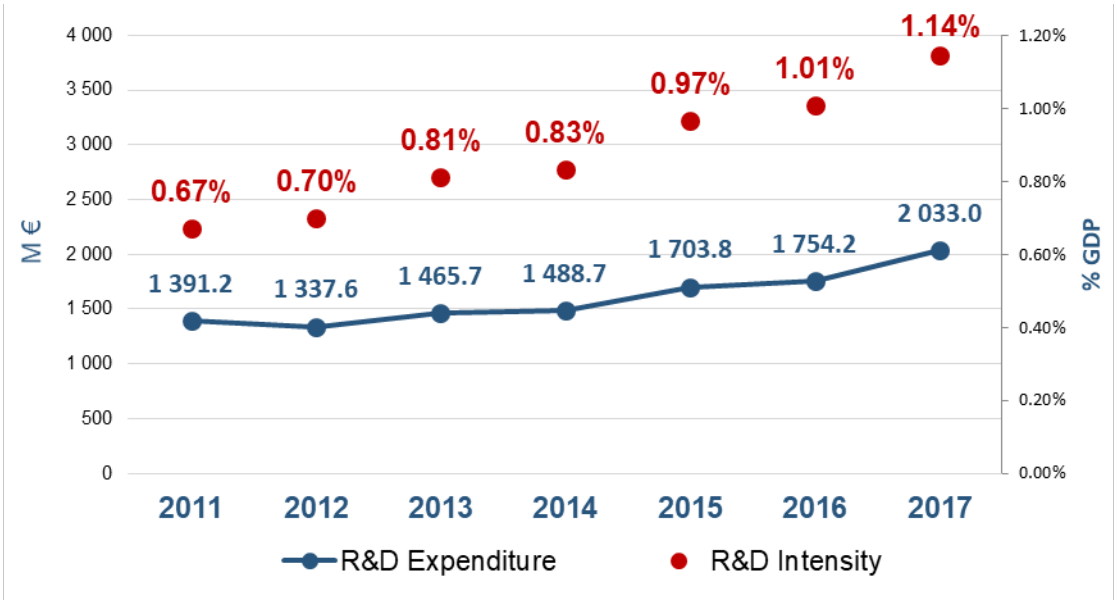
This chapter presents the R&D intensity indicator for Greece, expressed as the R&D expenditure as a percentage of GDP.

TABLE 1.
R&D Expenditure, national GDP (in million EUR) and R&D Intensity (R&D Expenditure as % GDP), 2011 – 2017

	2011	2012	2013	2014	2015	2016	2017
R&D Expenditure (million EUR)	1 391.2	1 337.6	1 465.7	1 488.7	1 703.8	1 754.2	2 033.0
GDP (million EUR)	207 028.9	191 203.9	180 389.0	177 559.4	175 697.4	174 199.3	177 735.3
R&D Intensity (R&D Expenditure as % GDP)	**0.67%**	**0.70%**	**0.81%**	**0.84%**	**0.97%**	**1.01%**	**1.14%**

Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ1, Δ2)

FIGURE 1.
R&D Expenditure and R&D intensity (R&D Expenditure as % GDP), 2011 – 2017



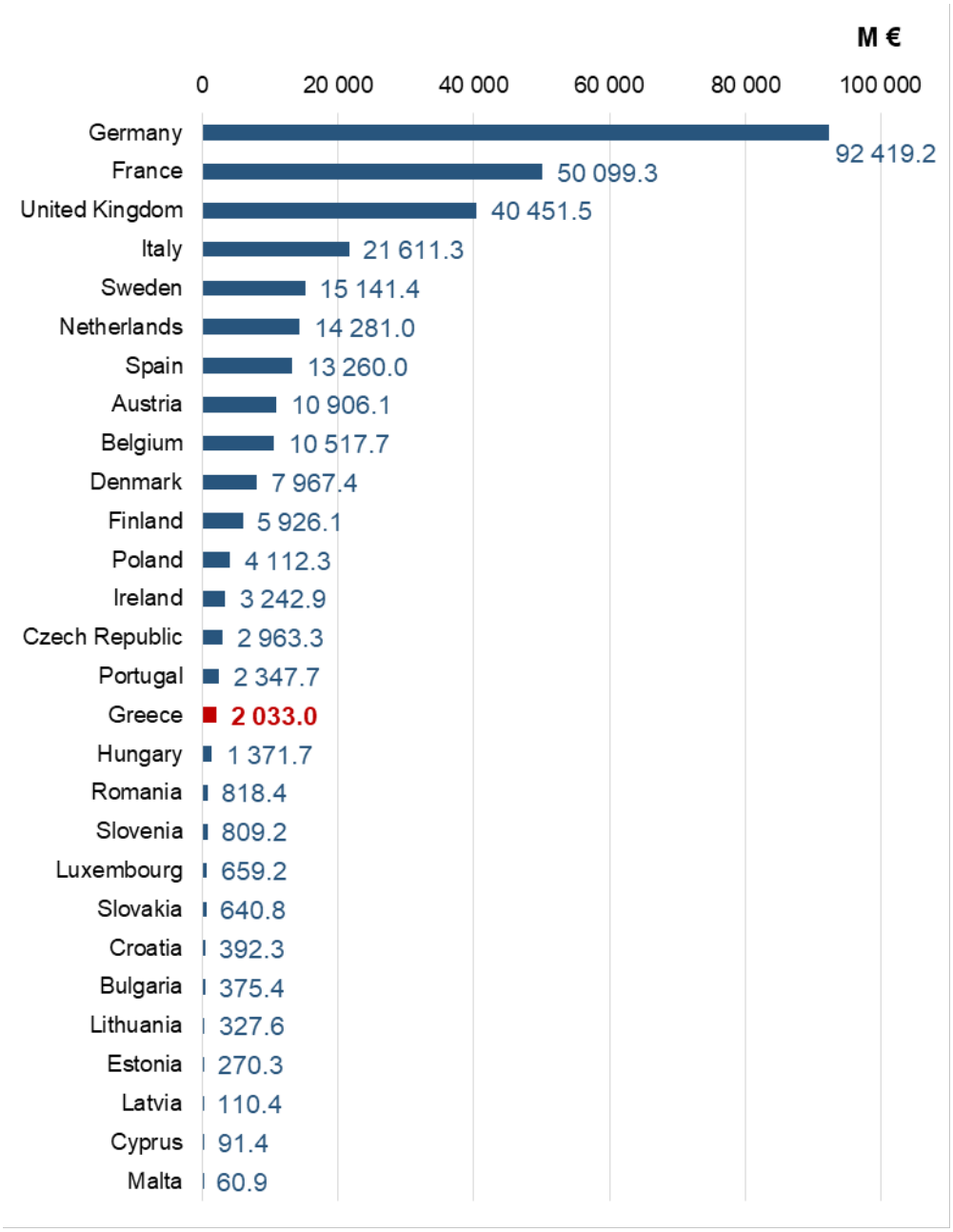
Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ1, Δ2)

3. R&D Expenditure - Greece among EU28 countries

The following figures show Greece's ranking among the EU28 Member States, according to the R&D expenditure (in million EUR) and to the R&D intensity (% GDP) for 2017.

FIGURE 2.

R&D Expenditure (in million EUR) in Greece (preliminary data 2017) and in other EU28 Member States (final data 2016).

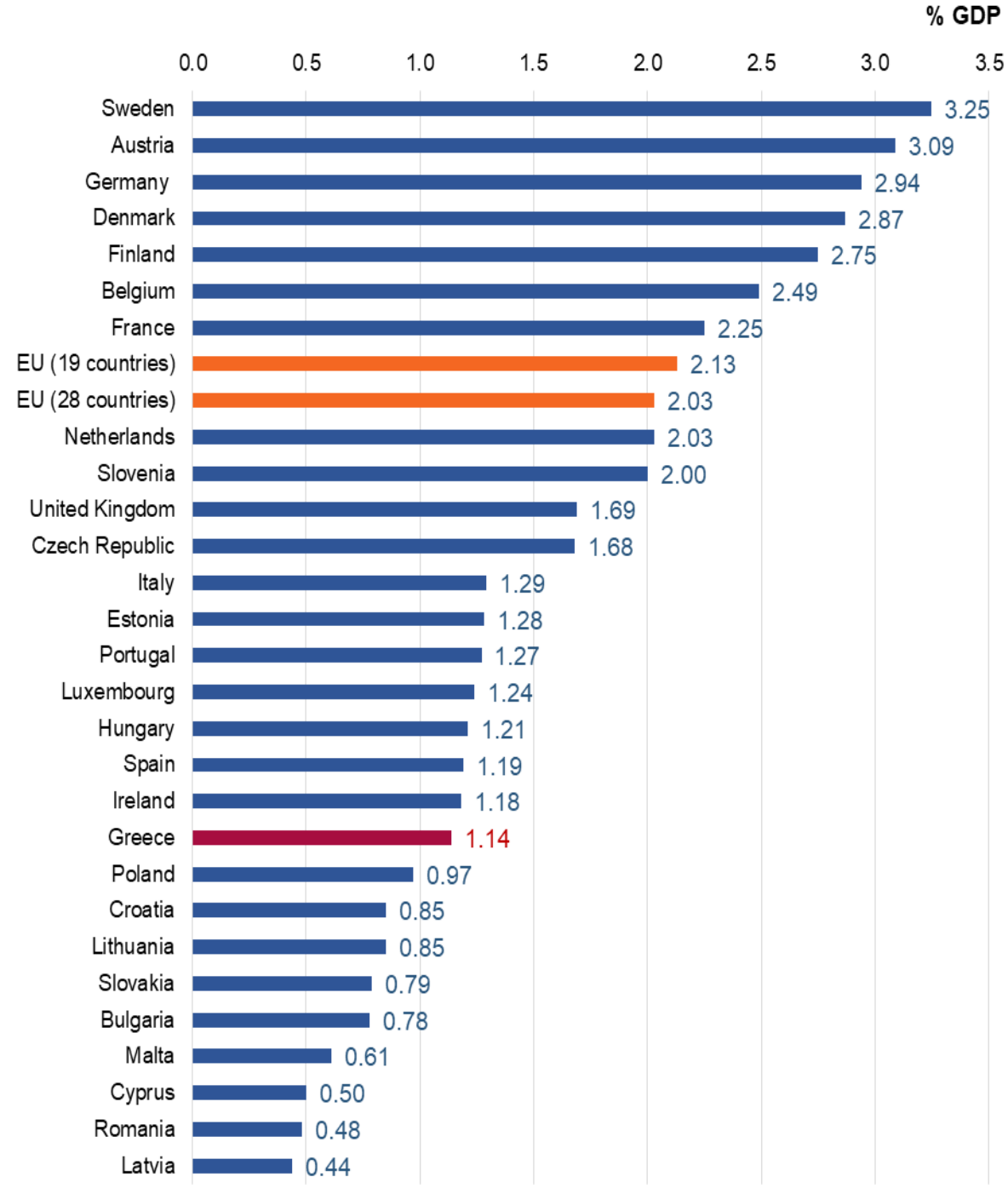


Sources:

EU28 countries Eurostat (http://ec.europa.eu/eurostat/web/science-technology-innovation/data/database, data code: rd_e_gerdtot, extracted 26.09.2018, last update 28.02.2018).

Greece: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ1)

FIGURE 3.
R&D intensity (R&D Expenditure as % GDP) in Greece (preliminary data 2017) and in other EU28 Member States (final data 2016).



Sources:

EU28 countries: Eurostat (http://ec.europa.eu/eurostat/web/science-technology-innovation/data/database, data code: rd_e_gerdtot) extracted 26.09.2018, last update 28.02.2018.

Greece: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ2)

4. R&D Expenditure by sector of performance

This chapter presents R&D expenditure across the four sectors identified by the Frascati Manual[1].

Throughout the tables and diagrams of this report, the four R&D sectors of performance which are used to classify the institutes/entities that perform R&D activities, are referred to in the following order:

- BES - Business Sector
- GOV - Government Sector
- HES - Higher Education Sector
- PNP - Private Non Profit Sector

A further analysis of the classification of the statistical units in the four sectors is made in Chapter 9 - Methodological Notes.

TABLE 2.
R&D Expenditure by sector of performance (in million EUR and annual changes), 2011 – 2015

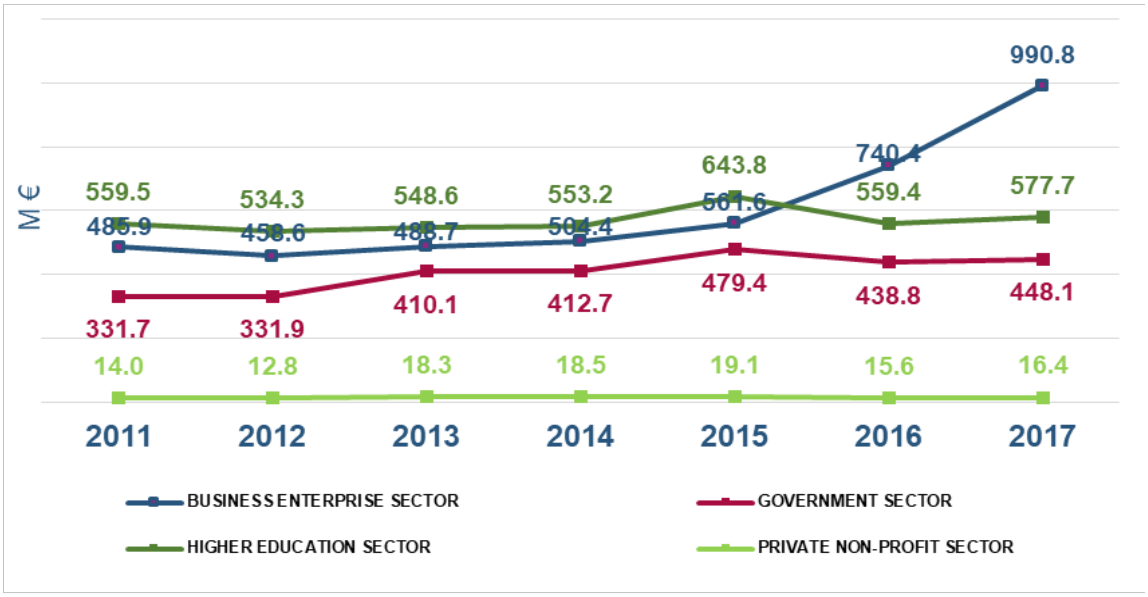
Sector of performance	2011	2012	2013	2014	2015	2016	2017
BES	485.9	458.6	488.7	504.4	561.6	740.4	990.8
GOV	331.7	331.9	410.1	412.7	479.4	438.8	448.1
HES	559.5	534.3	548.6	553.2	643.8	559.4	577.7
PNP	14.0	12.8	18.3	18.5	19.1	15.6	16.4
TOTAL[2]	**1 391.2**	**1 337.6**	**1 465.7**	**1 488.7**	**1 703.8**	**1 754.2**	**2 033.0**

Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ1)

[1]Frascati Manual (2015): Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris.

[2]Differences between aggregates and components can be due to rounding.

FIGURE 4.
R&D Expenditure by sector of performance (in million EUR), 2011 – 2017



Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ1)

TABLE 3.
R&D Intensity (R&D Expenditure as %GDP) by sector of performance, 2011 - 2017

Sector of performance	2011	2012	2013	2014	2015	2016	2017
BES	0.23%	0.24%	0.27%	0.28%	0.32%	0.43%	0.56%
GOV	0.16%	0.17%	0.23%	0.22%	0.27%	0.25%	0.25%
HES	0.27%	0.28%	0.30%	0.32%	0.37%	0.32%	0.32%
PNP	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
TOTAL	**0.67%**	**0.70%**	**0.81%**	**0.83%**	**0.97%**	**1.01%**	**1.14%**

Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ2)

5. Source of funds for R&D activities

This chapter presents R&D expenditure by source of funds.

Table 4 analyses the sources of funds for R&D activities for the whole country.

Tables 5 - 8 analyse the sources of funds for R&D activities carried out in each of the R&D sectors of performance.

In accordance with the Frascati Manual, sources of funds fall into the 5 following categories:

- Business Enterprise Sector – This includes funding from private Greek businesses and businesses from the wider public sector (eg State-owned Enterprises - SOEs) that is used for own R&D funding within the enterprises or for R&D funding of other sectors.
- Government - This includes funding from the state (central and regional government) as well as the own-funding of R&D bodies which belong to the GOV sector. In the table, the government sector is further analysed in the following sub components:
  - Ordinary budget: R&D expenditure funded from the ordinary budget. It mainly covers public organisations, Universities, Technological Educational Institutes, etc.
  - NSRF (National Strategic Reference Framework): R&D expenditure funded through the NSRF projects
  - Other sources: R&D expenditure funded by the Public Investment Budget except for NSRF, Budget annexed to the General Budget, Regions, Municipalities etc. It also includes R&D carried out by organisations belonging to the GOV sector with their own resources (using their own capital, donations, legacies, bequests, rents, etc.).
- Higher Education – This includes funds from institutes in the sector of higher education to other sectors. It also includes own funding of HES institutes, both public (own capital, donations, legacies, bequests, rents, etc).
- Private non-profit organisations – This includes funding from PNP institutions to other sectors and own-funding of the PNP sector.
- Abroad – This includes funding from:
  - European Commission (e.g. European Union Framework Programmes)
  - Other sources from abroad: R&D which is conducted by Greek institutions and is funded by businesses from abroad, from international organisations or other bodies from abroad.

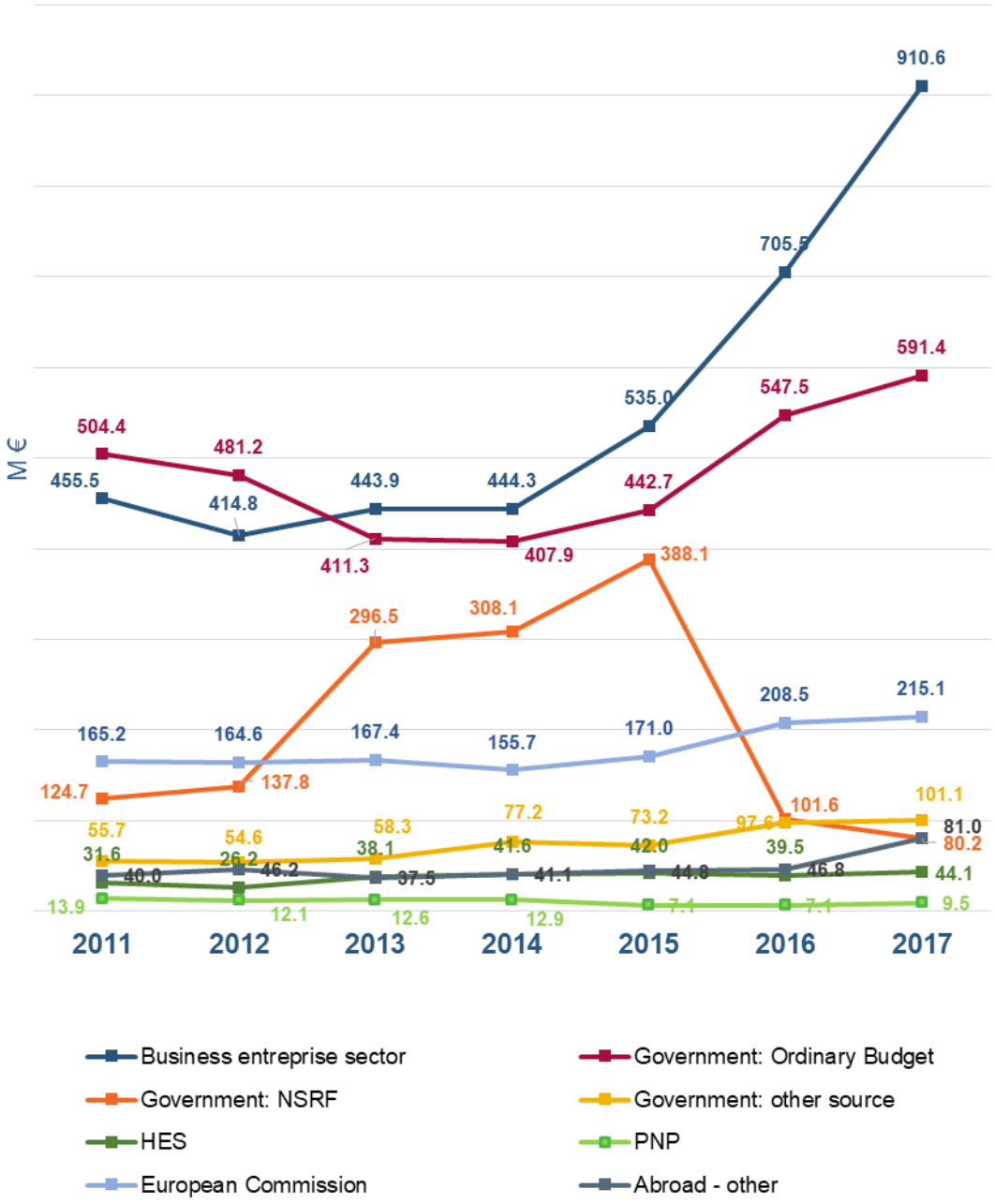
TABLE 4.
R&D Expenditure by source of funds (in million EUR, 2011 – 2017

Source of funds	2011	2012	2013	2014	2015	2016	2017
Business Enterprise sector	455.5	414.8	443.9	444.3	535.0	705.5	910.6
Government	684.9	673.6	766.1	793.2	904.0	746.8	772.7
Governmnet: Ordinary Budget	504.4	481.2	411.3	407.9	442.7	547.5	591.4
Government: NSRF	124.7	137.8	296.5	308.1	388.1	101.6	80.2
Government: other source	55.7	54.6	58.3	77.2	73.2	97.6	101.1
HES	31.6	26.2	38.1	41.6	42.0	39.5	44.1
PNP	13.9	12.1	12.6	12.9	7.1	7.1	9.5
Abroad	205.2	210.9	204.9	196.8	215.7	255.3	296.1
European Commission	165.2	164.6	167.4	155.7	171.0	208.5	215.1
Abroad -other	40	46.2	37.5	41.1	44.8	46.8	81.0
TOTAL[3]	**1 391.2**	**1 337.6**	**1 465.7**	**1 488.7**	**1 703.8**	**1 745.2**	**2 033.0**

Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ3)

[3]Differences between aggregates and components can be due to rounding.

FIGURE 5.
R&D Expenditure by source of funds (in million EUR), 2011 – 2017



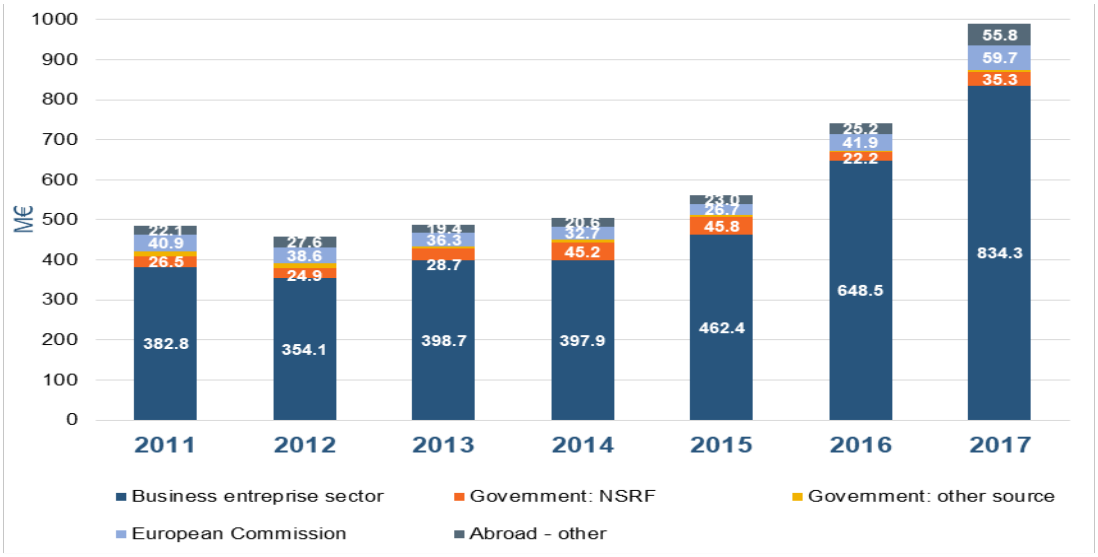
Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ3)

TABLE 5.
R&D Expenditure in the Business Enterprise Sector by source of funds (in million EUR), 2011–2017

Source of funds	2011	2012	2013	2014	2015	2016	2017
Business Enterprise sector	382.8	354.1	398.7	397.9	462.4	648.5	834.3
Government	39.1	37.6	34	52.9	49.5	24.6	40.5
Government: NSRF	26.5	24.9	28.7	45.2	45.8	22.2	35.3
Government: other source	12.5	12.7	5.3	7.7	3.7	2.4	5.2
HES	0.6	0.5	0.3	0.2	0.0	0.2	0.2
PNP	0.3	0.2	0	0.0	0.0	0.0	0.3
Abroad	63	66.2	55.7	53.4	49.7	67.1	115.5
European Commission	40.9	38.6	36.3	32.7	26.7	41.9	59.7
Abroad -other	22.1	27.6	19.4	20.6	23.0	25.2	55.8
TOTAL	**485.9**	**458.6**	**488.7**	**504.4**	**561.6**	**740.4**	**990.8**

Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ3)

FIGURE 6.
R&D Expenditure in the Business Enterprise Sector by source of funds (in million EUR), 2011 - 2017



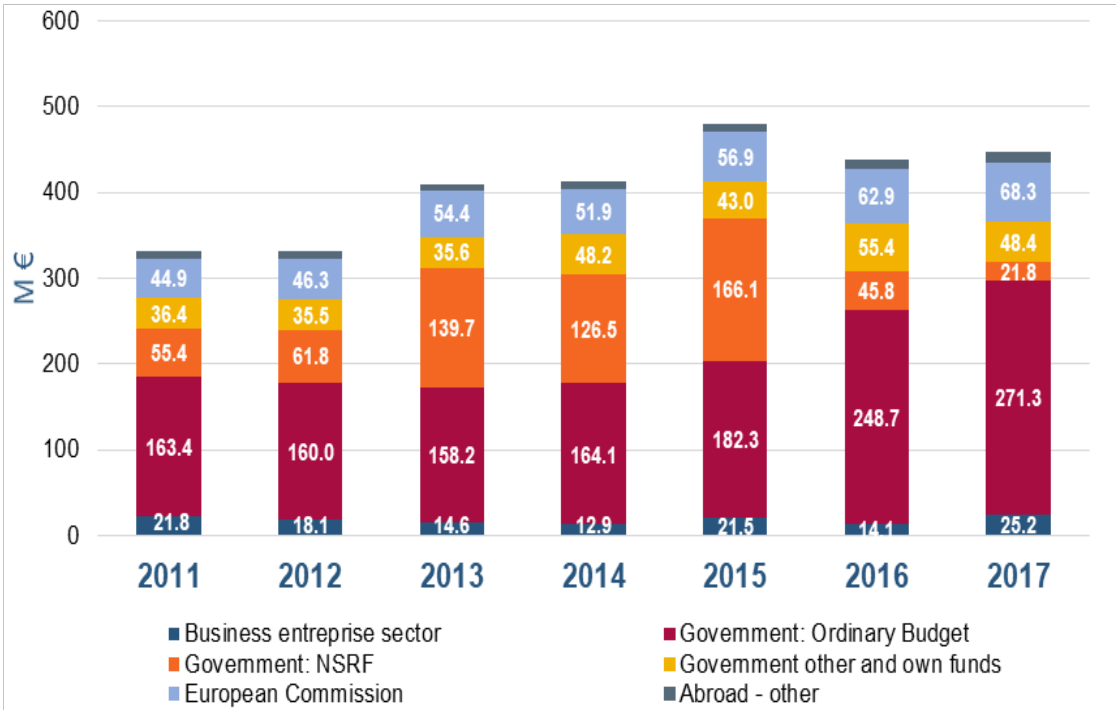
Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ3)

TABLE 6.
R&D Expenditure in the Government Sector by source of funds (in million EUR), 2011 – 2017

Source of funds	2011	2012	2013	2014	2015	2016	2017
Business Enterprise sector	21.8	18.1	14.6	12.9	21.5	14.1	25.2
Government	255.2	257.3	333.5	338.9	391.4	349.9	341.5
Governmnet: Ordinary Budget	163.4	160	158.2	164.1	182.3	248.7	271.3
Government: NSRF	55.4	61.8	139.7	126.5	166.1	45.8	21.8
Government: other source (including own funding)	36.4	35.5	35.6	48.2	43.0	55.4	48.4
HES	-	-	0.2	0.3	0.2	0.1	0.0
PNP	0.3	0.3	-	-	-	0.2	1.3
Abroad	54.4	56.2	61.8	60.6	66.2	74.5	80.1
European Commission	44.9	46.3	54.4	51.9	56.9	62.9	68.3
Abroad -other	9.5	9.8	7.4	8.7	9.2	11.7	11.8
TOTAL	**331.7**	**331.9**	**410.1**	**412.7**	**479.4**	**438.8**	**448.1**

Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ3)

FIGURE 7.
R&D Expenditure in the Government Sector by source of funds (in million EUR), 2011 – 2017



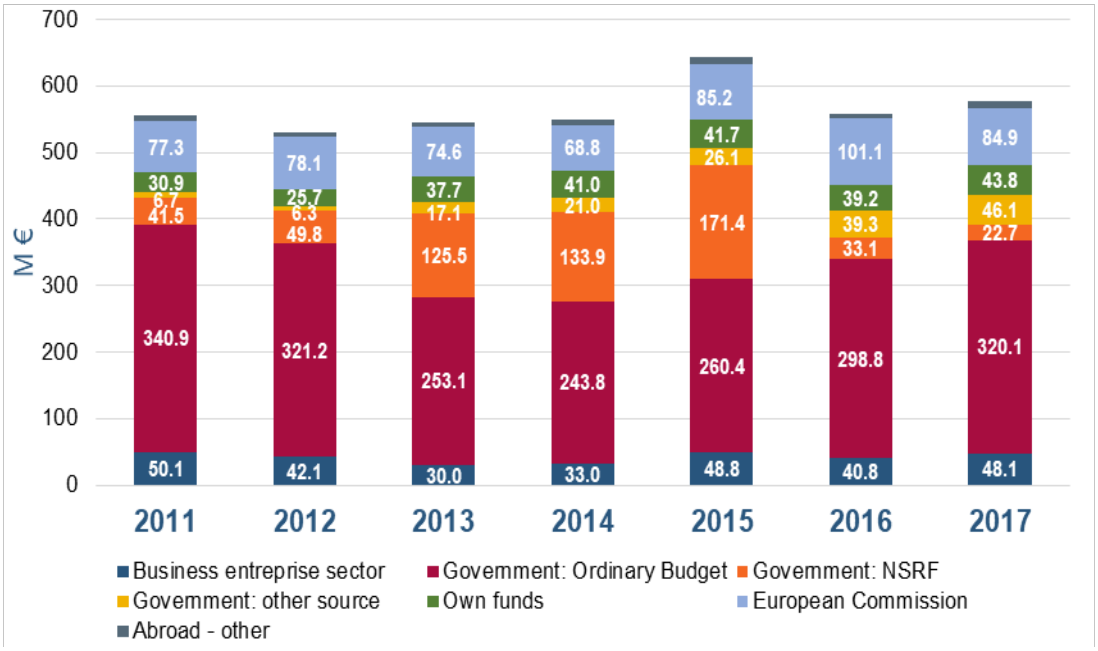
Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ3)

TABLE 7.
R&D Expenditure in the Higher Education Sector by source of funds (in million EUR), 2011 –2017

Source of funds	2011	2012	2013	2014	2015	2016	2017
Business Enterprise sector	50.1	42.1	30.0	33.0	48.8	40.8	48.1
Government	389.2	377.3	395.7	398.6	458.0	371.1	388.9
Governmnet: Ordinary Budget	340.9	321.2	253.1	243.8	260.4	298.8	320.1
Government: NSRF	41.5	49.8	125.5	133.9	171.4	33.1	22.7
Government: other source	6.7	6.3	17.1	21.0	26.1	39.3	46.1
HES (including own funding)	30.9	25.7	37.7	41.0	41.7	39.2	43.8
PNP	4.1	3.2	3.8	3.9	1.4	1.5	1.3
Abroad	85.2	86	81.5	76.7	94.0	106.8	95.6
European Commission	77.3	78.1	74.6	68.8	85.2	101.1	84.9
Abroad -other	7.9	7.9	6.9	7.9	8.8	5.7	10.7
TOTAL	**559.5**	**534.3**	**548.6**	**553.2**	**643.8**	**559.4**	**577.7**

Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ3)

FIGURE 8.
R&D Expenditure in the Higher Education Sector by source of funds (in million EUR), 2011 - 2017



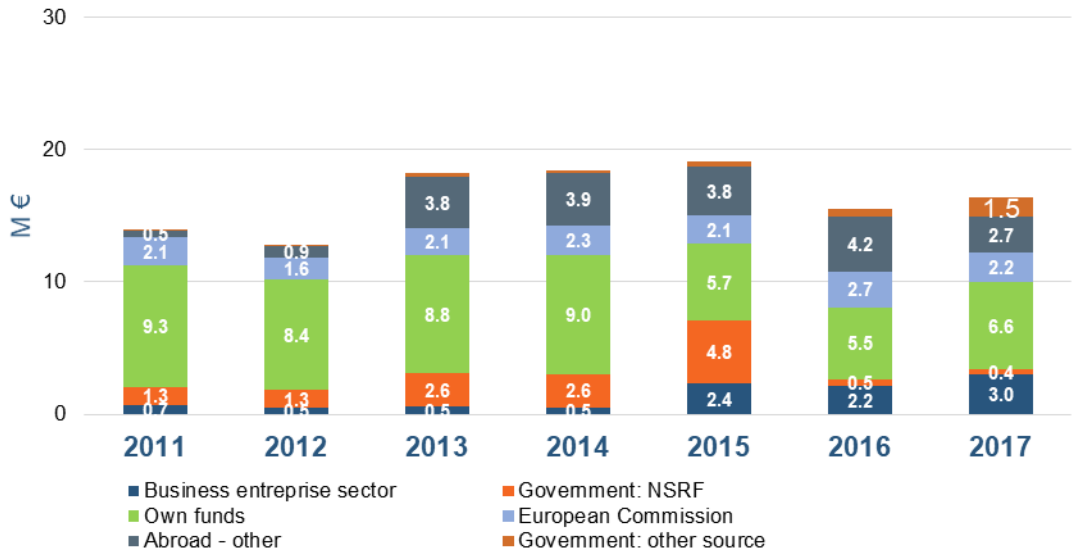
Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ3)

TABLE 8.
R&D Expenditure in the Private Non-Profit Sector by source of funds (in million EUR), 2011 – 2017

Source of funds	2011	2012	2013	2014	2015	2016	2017
Business Enterprise sector	0.7	0.5	0.5	0.5	2.4	2.2	3.0
Government	1.5	1.4	2.9	2.8	5.1	1.2	1.9
Governmnet: Ordinary Budget	0.1	-	-	-	0.0	0.1	0.0
Government: NSRF	1.3	1.3	2.6	2.6	4.8	0.5	0.4
Government: other source	0.1	0.1	0.3	0.3	0.3	0.6	1.5
HES (including own funding)	-	-	-	-	0.0	0.0	0.0
PNP	9.3	8.4	8.8	9.0	5.7	5.5	6.6
Abroad	2.6	2.5	5.9	6.2	5.9	6.8	4.9
European Commission	2.1	1.6	2.1	2.3	2.1	2.7	2.2
Abroad -other	0.5	0.9	3.8	3.9	3.8	4.2	2.7
TOTAL	**14.0**	**12.8**	**18.3**	**18.5**	**19.1**	**15.6**	**16.4**

Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ3)

FIGURE 9.
R&D Expenditure in the Private Non-Profit Sector by source of funds (in million EUR), 2011 – 2017



Source: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Δ3)

6. R&D Expenditure in the Research Institutes administered by GSRT

This chapter presents the evolution of R&D Expenditure of the research institutes that are supervised by the General Secretariat for Research and Technology[4] by source of funds, during the years 2011 – 2017.

TABLE 9.
R&D Expenditure in the GSRT Research Institutes by source of funds (in million EUR), 2011 – 2017

Source of funds	2011	2012	2013	2014	2015	2016	2017
Business Enterprise sector	11.3	11.1	6.7	7.6	11.0	6.3	7.3
Government	98.9	92.5	111.0	124.6	117.6	90.9	95.8
Governmnet: Ordinary Budget	56.1	52.3	49.2	44.9	41.5	56.4	62.4
Government: NSRF	20.5	18.3	41.6	46.3	56.6	5.2	4.1
Government: other source (including own funding)	22.4	21.9	20.2	33.4	19.6	29.3	29.2
HES	0.0	0.0	0.1	0.3	0.1	0.0	0.0
PNP	0.1	0.1	0.0	0.0	0.0	0.1	1.3
Abroad	42.3	41.6	50.6	48.5	55.3	62.0	63.0
European Commission	36.1	35.5	44.8	41.6	48.5	53.4	56.4
Abroad -other	6.2	6.2	5.8	6.8	6.7	8.6	6.6
TOTAL	**152.6**	**145.3**	**168.4**	**181.0**	**184.0**	**159.4**	**167.4**

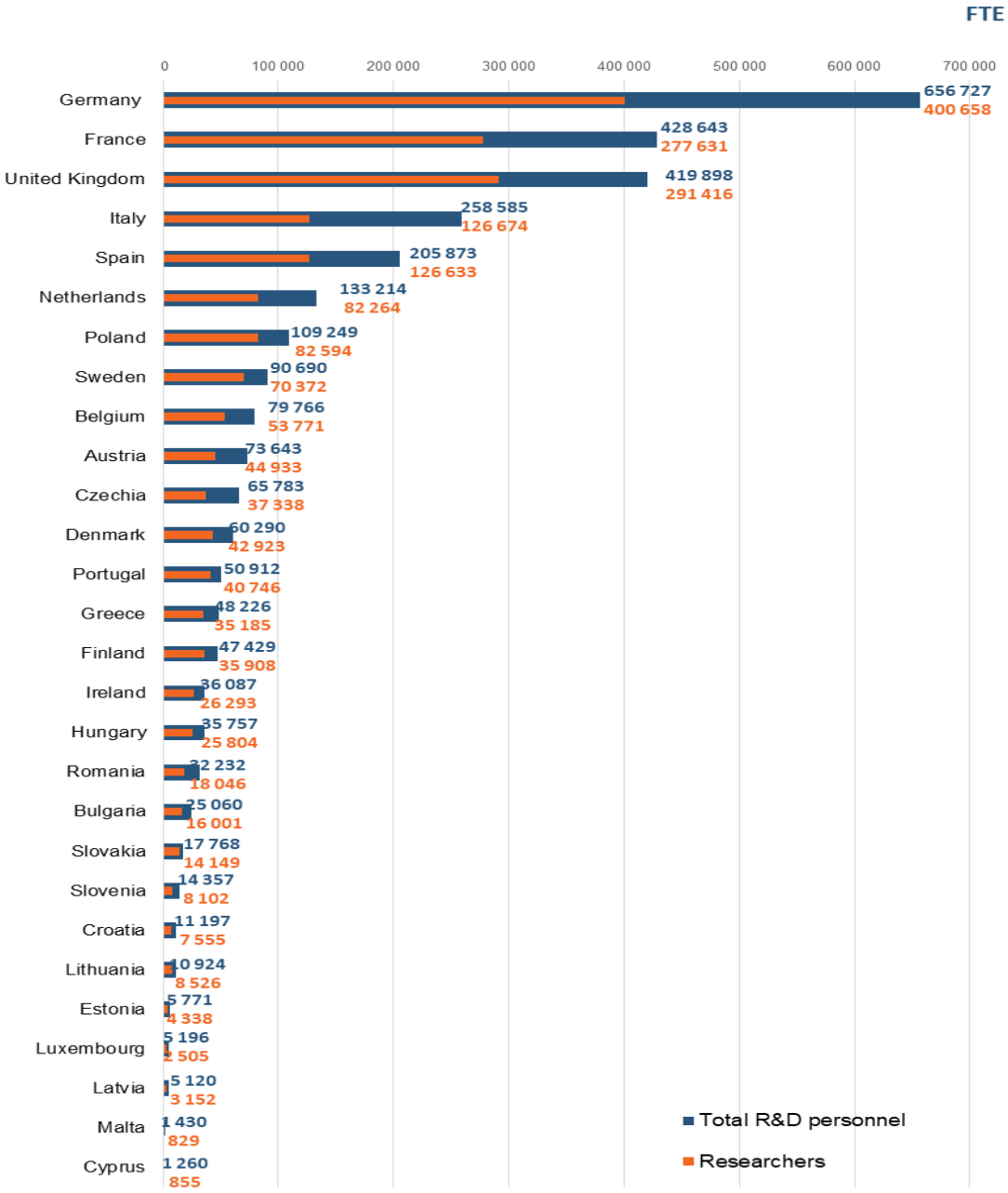
[4] Research Institutes (in alphabetic order in Greek): National Observatory of Athens, National Hellenic Research Foundation, The Centre for Research and Technology (including Center for Research and Technology – Thessaly), National Center for Scientific Research 'DEMOKRITOS', Hellenic Centre for Marine Research, National Centre for Social Research, Greek Atomic Energy Commission, Hellenic Pasteur Institute, "Alexander Fleming" Biomedical Sciences Research Center, Athena-Research and Innovation Center in Information, Communication and Knowledge Technologies, Foundation for Research & Technology – Hellas, Thessaloniki Science Center & Technology Museum - NOESIS.

7. R&D Personnel – Greece among EU28 countries

In 2017, the total R&D personnel in Greece was 48 226.1 (in full-time equivalents / FTE), of which the researchers were 35 185.4 FTE. The following figures show Greece's ranking among the EU28 Member States, according to the R&D personnel (in FTE and as a percentage in total employment).

FIGURE 11.

R&D personnel and Researchers (in full-time equivalents / FTE) in Greece (preliminary data 2017) and in other EU28 Member States, (final data 2016).



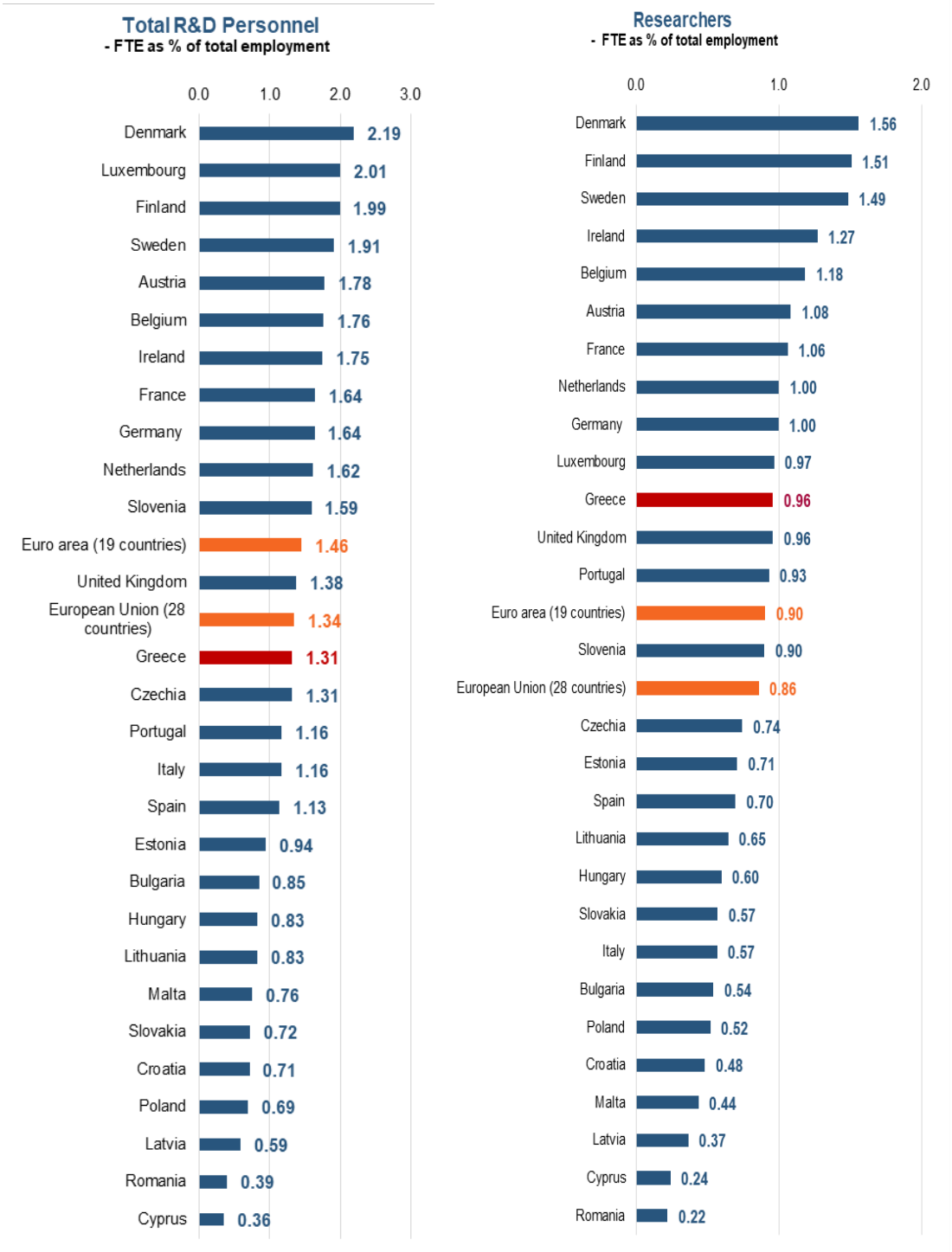
Sources:

EU28 countries: Eurostat (http://ec.europa.eu/eurostat/web/science-technology-innovation/data/database, data code: rd_p_persocc,, extracted 30.10.2018, last udpate 27.02.2018). For France and Poland, data refer to 2015.

Greece: EKT (http://metrics.ekt.gr/statistika-etak/datatables, data code: Π2)

FIGURE 12.

R&D personnel and Researchers (FTEs as % of total employment in Greece (preliminary data 2017) and in other EU28 Member States, (final data 2016).



Sources:

EU28 countries: Eurostat (http://ec.europa.eu/eurostat/web/science-technology-innovation/data/database, data code: rd_p_perslf], extracted 30.10.2018, last udpate 27.02.2018) For France and Poland, data refer to 2015.

Greece: EKT

8. R&D Personnel per Sector of Performance

R&D personnel includes all persons employed directly in R&D, as well as those providing direct services such as R&D managers, administrators, technicians and clerical staff. R&D personnel is classified according to its R&D function: researchers and other R&D personnel.

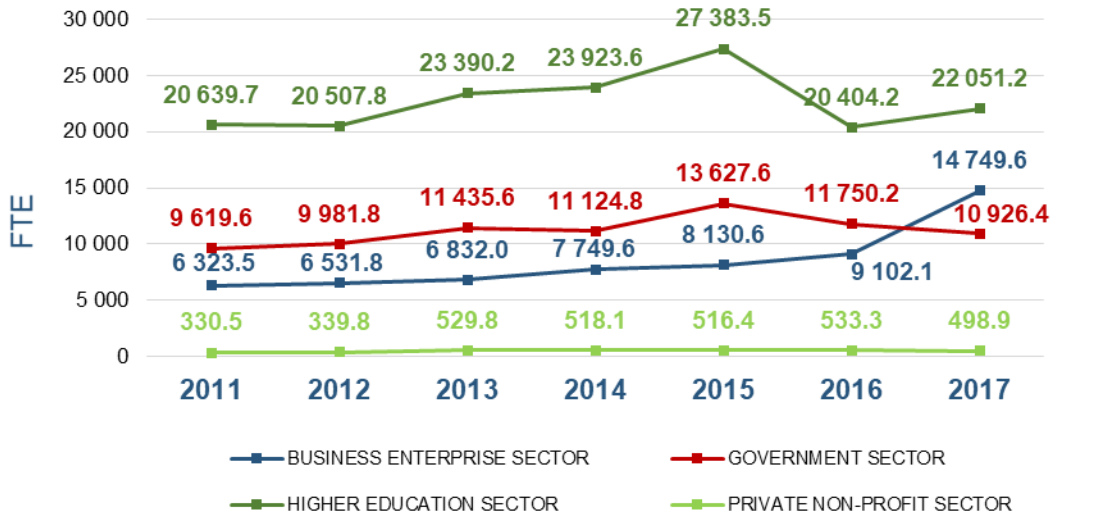
The figures below present the evolution of the R&D Personnel, expressed in full-time equivalents (FTE) during the 7-year period 2011 – 2017, for both total R&D Personnel and Researchers.

TABLE 10.
R&D Personnel by sector of performance (FTE), 2011 – 2017

Sector of performance	2011	2012	2013	2014	2015	2016	2017
BES	6 323.5	6 531.8	6 832.0	7 749.6	8 130.6	9 102.1	14 749.6
GOV	9 617.4	9 981.8	11 435.5	11 124.8	13 627.6	11 750.2	10 926.4
HES	20 639.7	20 507.8	23 390.2	23 923.6	27 383.5	20 404.2	22 051.2
PNP	330.5	339.8	529.8	518.1	516.4	533.3	498.9
TOTAL[5]	**36 913.3**	**37 361.0**	**42 187.6**	**43 316.1**	**49 658.0**	**41 789.8**	**48 226.1**

Source: EKT (http://metrics ekt gr/statistika-etak/datatables, data code: Π2)

FIGURE 13
R&D Pe



rsonnel by sector of performance (FTE), 2011 – 2017

Source: EKT (http://metrics ekt gr/statistika-etak/datatables, data code: Π2)

[5]Differences between aggregates and components can be due to rounding.

TABLE 11

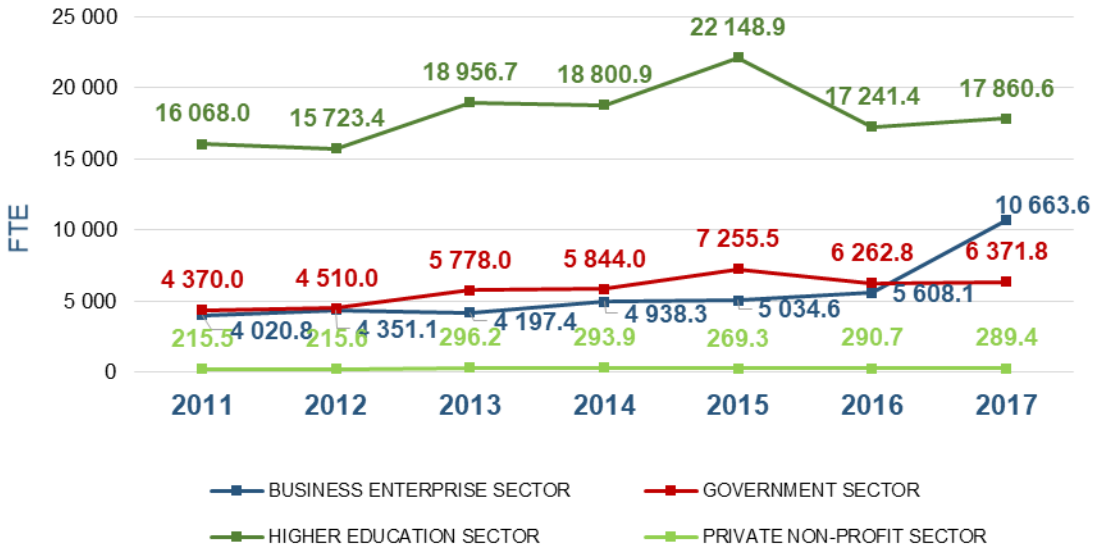
Researchers by sector of performance (FTE), 2011 – 2017

Sector of performance	2011	2012	2013	2014	2015	2016	2017
BES	4 020.8	4 351.1	4 197.4	4 938.3	5 034.6	5 608.1	10 663.6
GOV	4 369.1	4 510.0	5 777.9	5 844.0	7 255.5	6 262.8	6 371.8
HES	16 068.0	15 723.4	18 956.7	18 800.9	22 148.9	17 241.4	17 860.6
PNP	215.5	215.6	296.2	293.9	269.3	290.7	289.4
TOTAL[6]	**24 674.3**	**24 800.0**	**29 228.2**	**29 877.1**	**34 708.3**	**29 403.0**	**35 185.4**

Source: EKT (http://metrics ekt gr/statistika-etak/datatables, data code: Π2)

FIGURE 14

Researchers by sector of performance (FTE), 2011 - 2017



Source: EKT (http://metrics ekt gr/statistika-etak/datatables, data code: Π2)

[6] Differences between aggregates and components can be due to rounding.

9. Methodological Notes

Brief data description	The aim of the R&D (Research and Development) survey is to produce statistics about (intramural) R&D Expenditure and R&D personnel covering R&D performing entities in the private and public sectors as follows: Business Enterprise Sector (BES), Government Sector (GOV), Higher Education Sector (HES), Private non-Profit Sector (PNP) as well as for the country as a whole. R&D Expenditure as a percentage of GDP is used to calculate the R&D Intensity of a country. This publication presents preliminary data for R&D expenditure and R&D Personnel (in FTE) for 2017 in Greece, in accordance with the European Regulation (995/2012). Further and more detailed analyses of final data will be send to Eurostat by 30th June 2019 and will be published here: http://metrics.ekt.gr/statistika-etak.
Institutional Coverage	The main analysis of R&D statistics is by four institutional sectors of performance. Statistical units, from which data are collected, are therefore classified into the following four categories: ▪ Business enterprise sector (BES), which includes all firms, organisations and institutions whose primary activity is the market production of goods or services (other than higher education). In addition, this sector includes public enterprises as well as non-profit institutions mainly serving the enterprises. Economic activity (NACE rev.2) and size class coverage is defined in Commission Regulation 995/2012. ▪ Government (GOV) sector, which includes all departments, offices and other bodies administered or/and financed by Ministries, such as the Public Research Centers that are supervised by the General Secretariat for Research and Technology (GSRT), other Public Research Institutions supervised by different Ministries, archaeological and cultural institutions, public hospitals, public independent authorities, etc. ▪ Higher education sector (HES), which includes all Universities and Technological Educational Institutes (TEI), University research institutes (EPI) and similar establishments in the Technological Educational Institutes (Technological Research Centres / KTE), University Hospitals, as well as other HE schools/academies (e.g. Higher Ecclesiastical Schools, Military Academies). After the implementation of the new Frascati Manual (2015) the Private Institutes of Vocational Training (IEK) accredited by the Ministry of Education and Religious Affairs are not included in Higher Education Sector (HES). These institutions are included in BES or PNP according to their legal form. ▪ Private non-profit (PNP) sector, which includes non-market, private non-profit institutions serving the general public, such as non-market units, professional and learned societies, charities, relief or aid agencies, trade unions, consumers' associations, etc
Concepts and definitions	Basic statistical concepts and definitions, standard classifications and guidelines for the production of R&D statistics are outlined in the Frascati Manual (OECD, 2015). Research & Development – R&D: According to the Frascati Manual, 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 this stock of knowledge to devise new applications. The term R&D covers three activities: basic research, applied research and experimental development. **Basic research** is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view. **Applied research** is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

Experimental development is systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed.

R&D covers both formal R&D in R&D units and informal or occasional R&D in other units.

Intramural R&D Expenditure (GERD)

R&D Expenditure data are compiled on the basis of performers' reports of intramural expenditure. Intramural expenditure are all expenditure for R&D performed within a statistical unit or sector of the economy during a specific period, whatever the source of funds.

Both current (i.e. labour cost and other current cost such as non-capital purchases of materials, supplies and equipment to support R&D) and capital expenditure (i.e. expenditure on land and buildings, instruments and equipment) are included.

Extramural expenditure incurred for the acquisition of R&D performed by other units and grants given to others for performing R&D are excluded.

R&D personnel

The R&D personnel includes all those employed in R & D scientists and engineers (researchers), highly trained technical staff and personnel who directly support the implementation of R&D activities (eg, workers, manufacturers, administrators, etc.). Also included those involved in planning and managing the work of other researchers.

R&D personnel includes the following categories.

Researchers: Professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned. Postgraduate students at the PhD level also fall into this category.

Other R&D Personnel: Personnel involved in R&D activities by performing scientific and technical tasks, usually under the supervision of researchers (e.g. developers, programmers, manufacturers, personnel collecting bibliometric material or implementing surveys and interviews, etc.), as well as personnel performing various tasks directly related to R&D activities necessary for the completion of these tasks (e.g. workers, secretaries or other administrators).

R&D personnel data is available in head count (HC) and in full-time equivalent (FTE).

Full-Time Equivalent (FTE)

Full time equivalent (FTE) is the unit used to measure employed persons or students in a way that makes them comparable although they may work or study a different number of hours per week. It is therefore based on the time a person devotes to R&D activities.

FTE is calculated by comparing the time one devotes to R&D activities with full-time work. One FTE may therefore be thought of as one person-year, while for a part-time R&D worker FTE is calculated as the percentage of the time that he/she spends on R&D over his/her total working time.

More concepts and definitions are available in the online 'Glossary' (http://metrics.ekt.gr/el/lexicon/2) in Greek only.

Legal framework

R&D data collection is based on Commission Regulation 995/2012 (from reference year 2012 onwards) on statistics on Science and Technology.

The National Documentation Center (www.ekt.gr), as a National Authority of the Greek Statistical System is responsible for the production of the official statistics on Research, Development and Innovation (Government Gazette 3482 / 05.10.2017) in Greece.

The collection of the data presented in this publication was made in collaboration with the Hellenic Statistical Authority (Memoranda of Understanding of 05.06.2016).

Data collection

The data are collected through an extensive survey including all known or potential R&D performers in the BE, HE, GOV and PNP sectors. For the needs of the

	survey, EKT has developed a dedicated register of all known R&D performers, based on information from administrative sources. The R&D register is updated on a systematic basis. Data are collected through census survey in HE, GOV and PNP sectors and through a combination of census and sample surveys in the business enterprise sector. In addition, administrative data is used as provided by the following official administrative sources: ▪ HE sector: General University Funds (GUF) and data on permanent personnel, provided by the Ministry of Education, Research and Religious Affairs and the Ministry of Health. ▪ GOV sector: Government funding through Ordinary Budget and data on permanent personnel provided by the Ministry of Culture and the Ministry of Health. Data validation and editing is performed in collaboration with respondents, whenever necessary. Consistency checks are also conducted between the collected data and relevant data provided by the following administrative sources: ▪ Monitoring Information System (M.I.S.) the central information system about projects financed under the National Strategic Reference Framework (NSRF) – Source: Special Service for the Monitoring Information System (M.I.S.). ▪ eCORDA database with information about signed grants and beneficiaries with regards to EU Framework Programme for Research (FP7, H2020) – Source: European Commission ▪ GBARD data – Source: Official GBAORD data that have been collected and compiled by EKT and made available through Eurostat dissemination database Data processing and data analysis have been conducted using standard methodological techniques and Eurostat guidelines on the harmonized production of R&D statistics across Member States.

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Research and Development Expenditure and Personnel in Greece in 2017 - Main Indicators

Preliminary Data

ISBN: 978-618-5355-18-0 (print)
ISBN: 978-618-5355-19-7 (pdf)

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Co-funded by Greece and the European Union