National R&I Monitoring Report
2019 - 2020

Prepared by
The Malta Council for
Science & Technology

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The Malta Council for Science & Technology

National R&I Monitoring Report **2019 - 2020**

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Introduction & Methodology

Following support received through the Horizon 2020 Policy Support Facility on 'Monitoring the Maltese National Research and Innovation System' between 2015 to 2016, the Malta Council for Science and Technology set up the first national R&I monitoring system was established to oversee the progress towards achieving the goals and actions of the National R&I Strategy 2014-2020. The first monitoring report was published in 2018, covering data collected during the 2014-2018 implementation period, and the current report is a continuation covering the period 2019-2020. It is also the final monitoring report that will cover the implementation of the National R&I Strategy for 2014-2020.

The monitoring system framework has remained unchanged as presented in the previous report and continues to address the three main Pillars that represent the three overarching goals of the R&I Strategy, including the Smart Specialisation Strategy for Malta. For these Pillars there are 8 corresponding Actions, which are then divided into 26 Action Lines labelled from A to Z.

Whilst the monitoring framework has remained the same, some minor updates have been made to the indicators and data sources in this report in order to ensure more reliable and robust data. The monitoring report 2018 was the first of its kind and hence, it was also a learning experience resulting in some fine tuning of indicators. In some instances, data sources such as the RIO report, from which we had extracted data in the past have now been discontinued and therefore alternative data sources were sought out wherever possible.

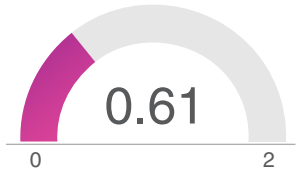
The data for this report was collected using different methodologies due to the diverse nature of the indicators. Data sources included official sources, such as Eurostat, as well as data collated directly from local R&I stakeholders.

The second chapter of this report provides updated information on the headline indicator data and the progress Malta has made towards achieving the 2020 R&I targets. Chapter three will then include data for the Pillar level and Action line level result indicators.

1 Headline Indicators

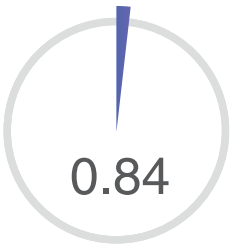
Headline Indicators

The headline indicators were included in the Maltese National R&I Strategy as a way to provide a balanced assessment of both the inputs and the outputs of the national research and innovation system. Targets were also set for these indicators. The complete list of headline indicators together with their 2020 targets and their latest available figures can be found below:



Gross R&D expenditure as a percentage of GDP

2020 Target = 2.0%

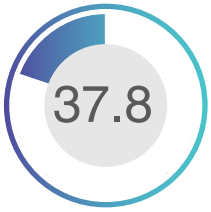


Number of PhD holders as a percentage of active population

2020 target = 0.6%

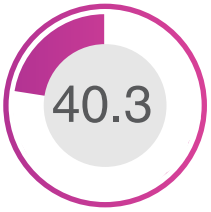
Number of researchers (expressed in full-time equivalents, FTE)

2020 target = 900



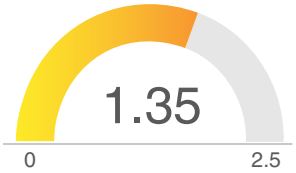
Enterprises with innovation activity (product, process, ongoing or abandoned, organisational and market innovation) as a percentage of total enterprises

2020 target = 50%



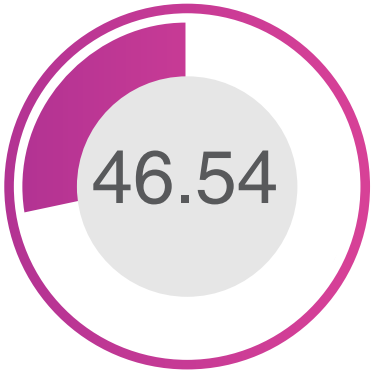
Employment in knowledge-intensive activities as a percentage of total employment

2020 target = 55%



Innovation expenditure as a percentage of GDP

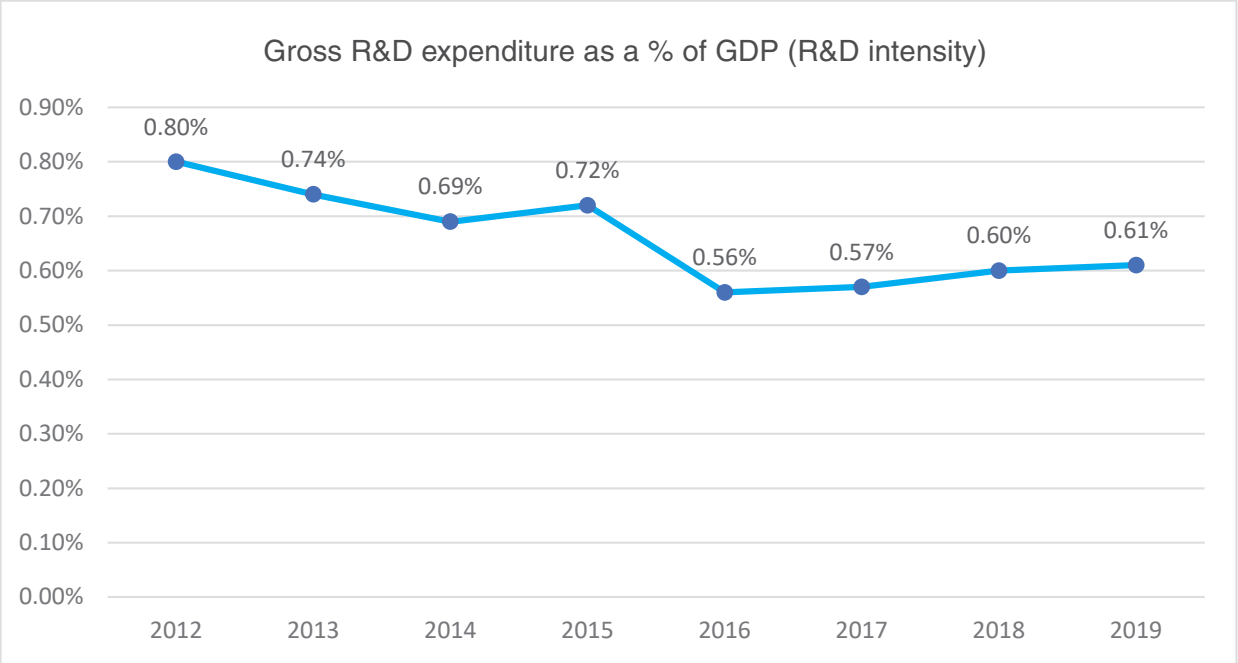
2020 target = 2.50%



Enterprises with innovation activity (product, process, ongoing or abandoned, organisational and marketing innovation) in the Core NACE Codes as a percentage of total enterprises

2020 target = 60%

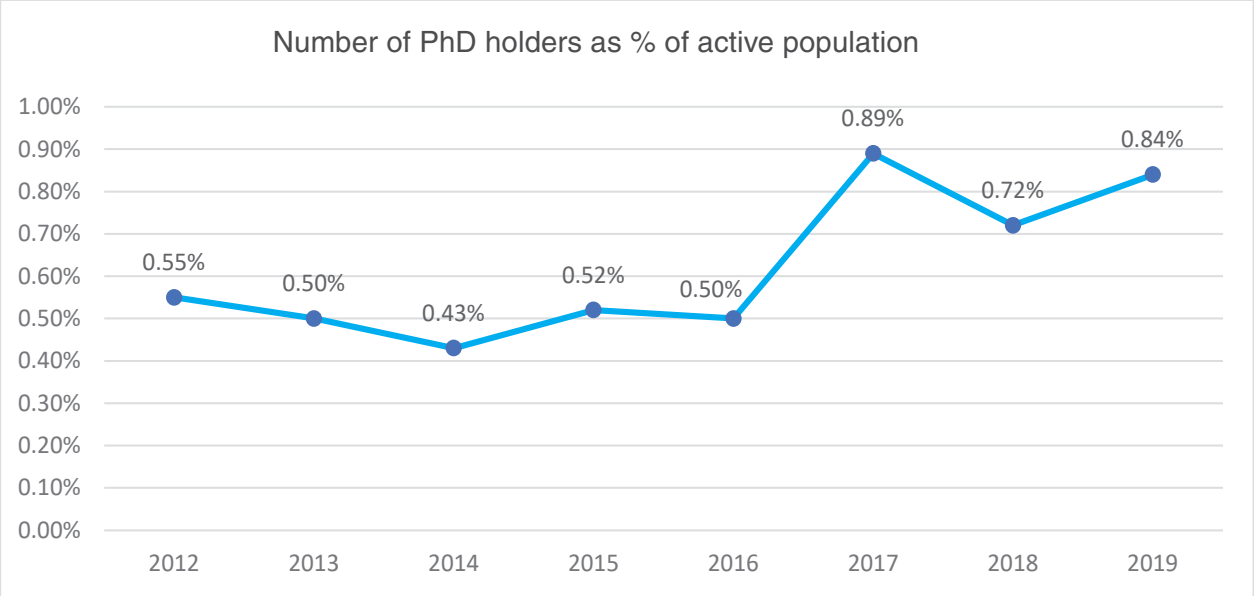
Gross R&D expenditure as a percentage of GDP – 2020 Target = 2.0%



Gross R&D Expenditure (GERD) has remained stable from 2016 to 2019, increasing slightly every year, however the expenditure is still far off from the 2% target proposed in the R&I Strategy. The table below shows that actual figures for this indicator, and whilst both the GDP and GERD are increasing over time, the actual R&D expenditure is not increasing at the same rate as the GDP. From 2012 to 2019, the GDP has been growing at an average rate of 9.7%, whilst GERD has a growth rate of 4.97% for the same time period.

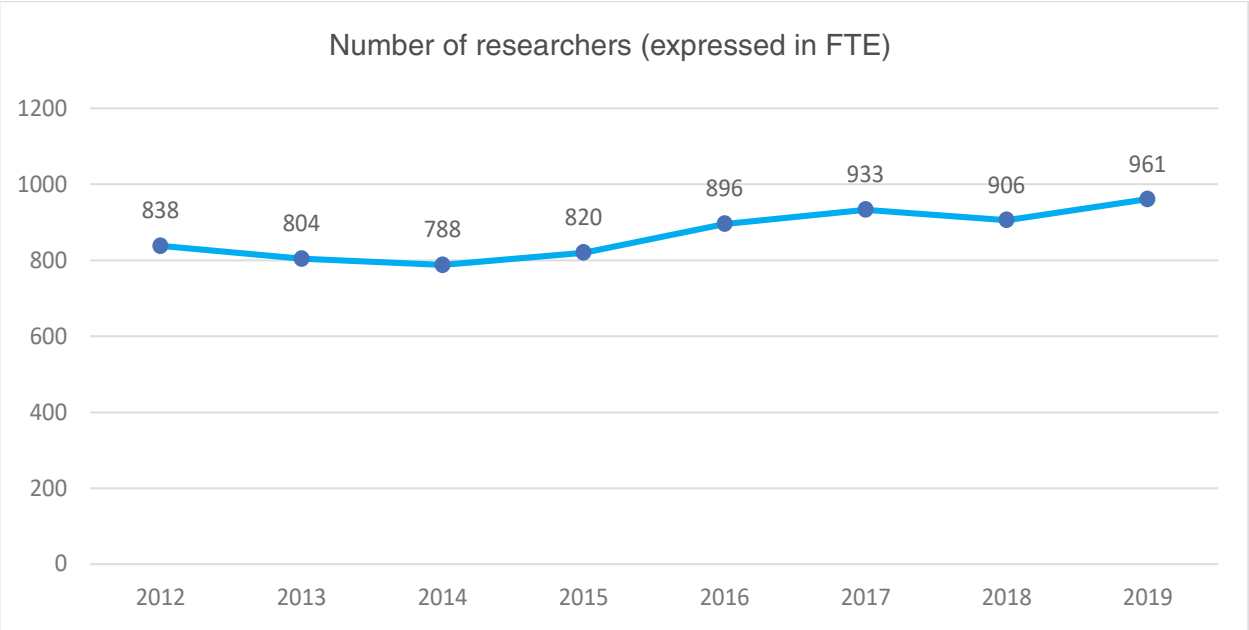
Time	2012	2013	2014	2015	2016	2017	2018	2019
GDP in million €	7,364.5	7,944.3	8,751.1	9,996.7	10,566.5	11,959.4	12,979.6	14,047.6
GERD in million €	59.234	59.055	60.539	71.491	58.702	65.928	74.626	79.77(p)

Number of PhD holders as a percentage of active population – 2020 target = 0.6%



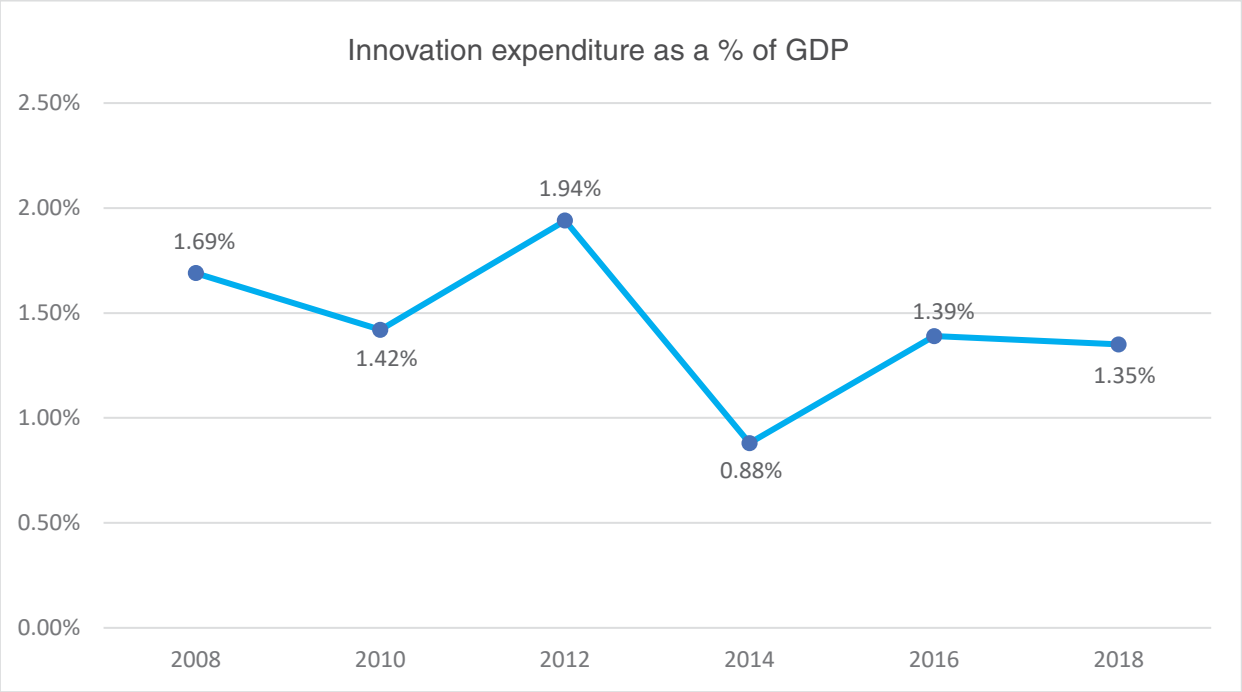
The number of PhD holders as a percentage of active population increased substantially in 2017 and the 0.6% target was achieved. A slight decrease was observed in 2018 however the figure continued to increase in 2019.

Number of researchers (expressed in full-time equivalents, FTE) – 2020 target = 900



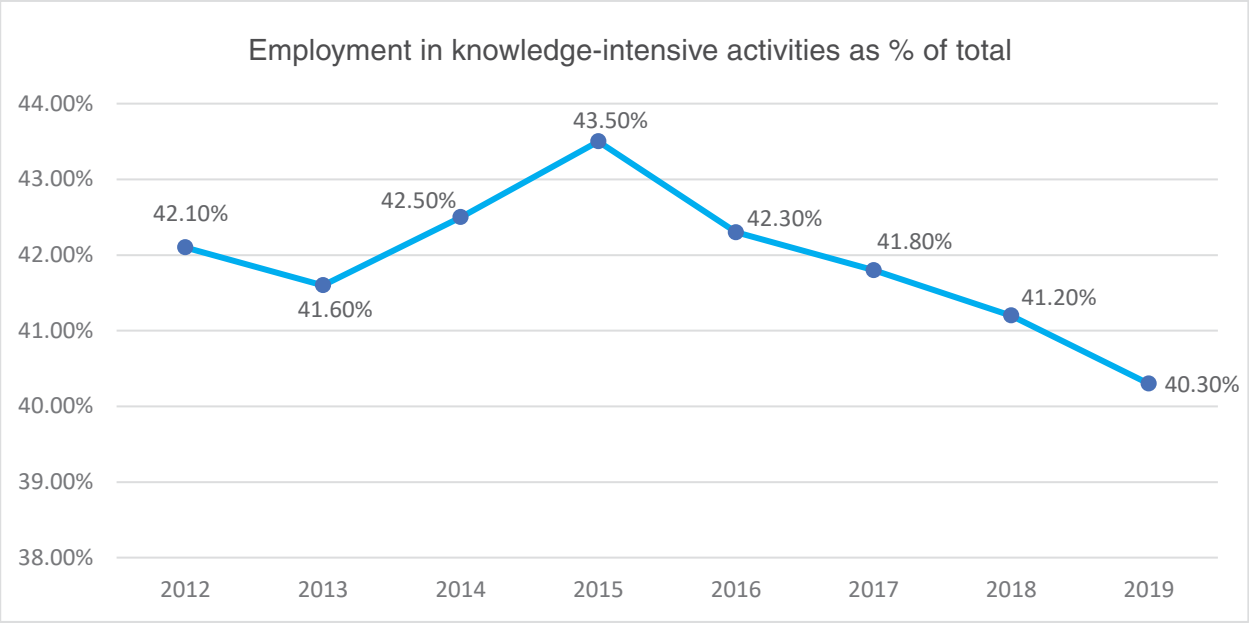
The target for **number of researchers** has also been achieved in 2017 with a gradual increase over time.

Innovation expenditure as a percentage of GDP – 2020 target = 2.50%



The indicator is extracted from the Community Innovation Survey and measures the private sector's expenditure on the implementation of a new or significantly improved product, process, marketing or organisational innovation. The innovation expenditure target has not been reached.

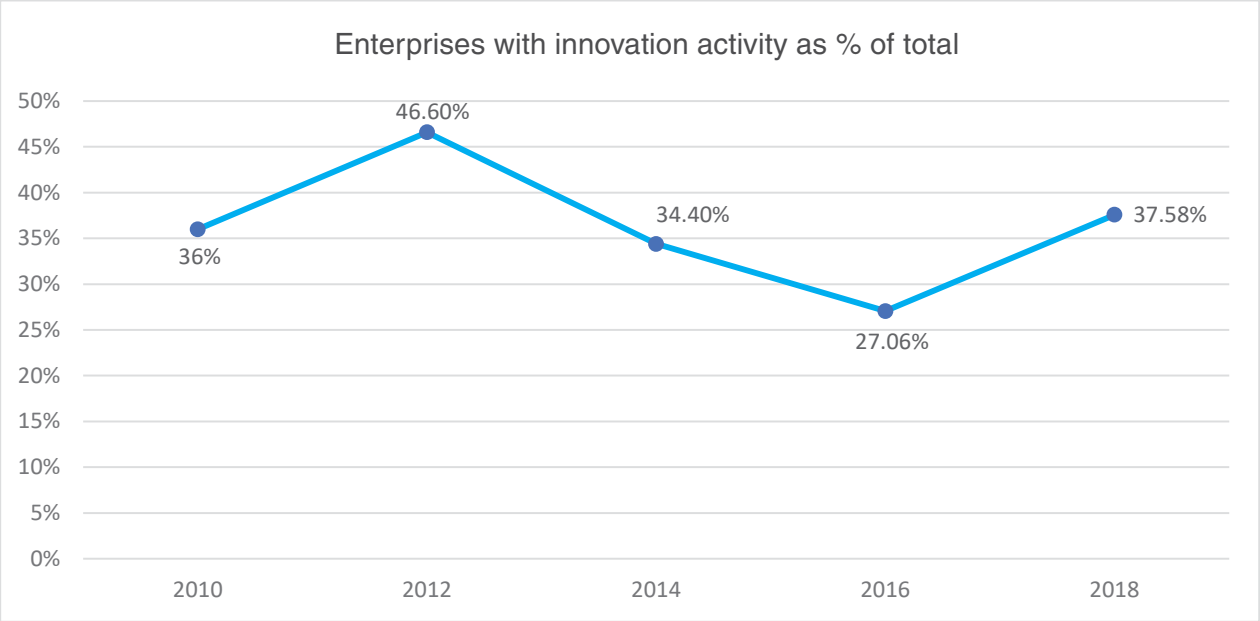
Employment in knowledge-intensive activities as a percentage of total employment – 2020 target = 55%



An activity is classified as knowledge intensive if employed tertiary educated persons represent more than 33% of the total employment in that activity[1]. A gradual decrease has been observed for this indicator since 2015 and the target has not been reached for 2020.

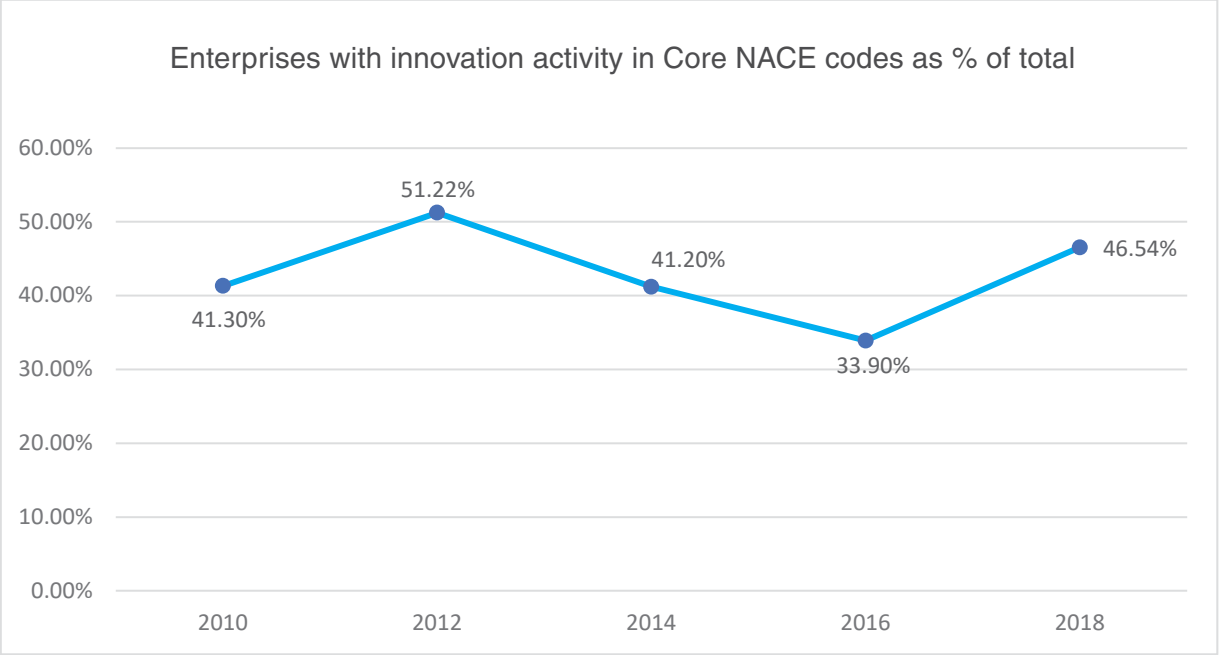
1. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Knowledge_Intensive_Activity_(KIA)

Enterprises with innovation activity (product, process, ongoing or abandoned, organisational and market innovation) as a percentage of total enterprises – 2020 target = 50%



The target for this headline indicator was closest to being reached in 2012, however the figure declined from 2014 to 2016 by almost 19.54%. The latest figure for 2018 shows that **Enterprises with innovation activities** are once again increasing, however, it is still too early to tell if the 2018 figure is an anomaly or an upward trend.

Enterprises with innovation activity (product, process, ongoing or abandoned, organisational and marketing innovation) in the Core NACE Codes as a percentage of total enterprises – 2020 target = 60%



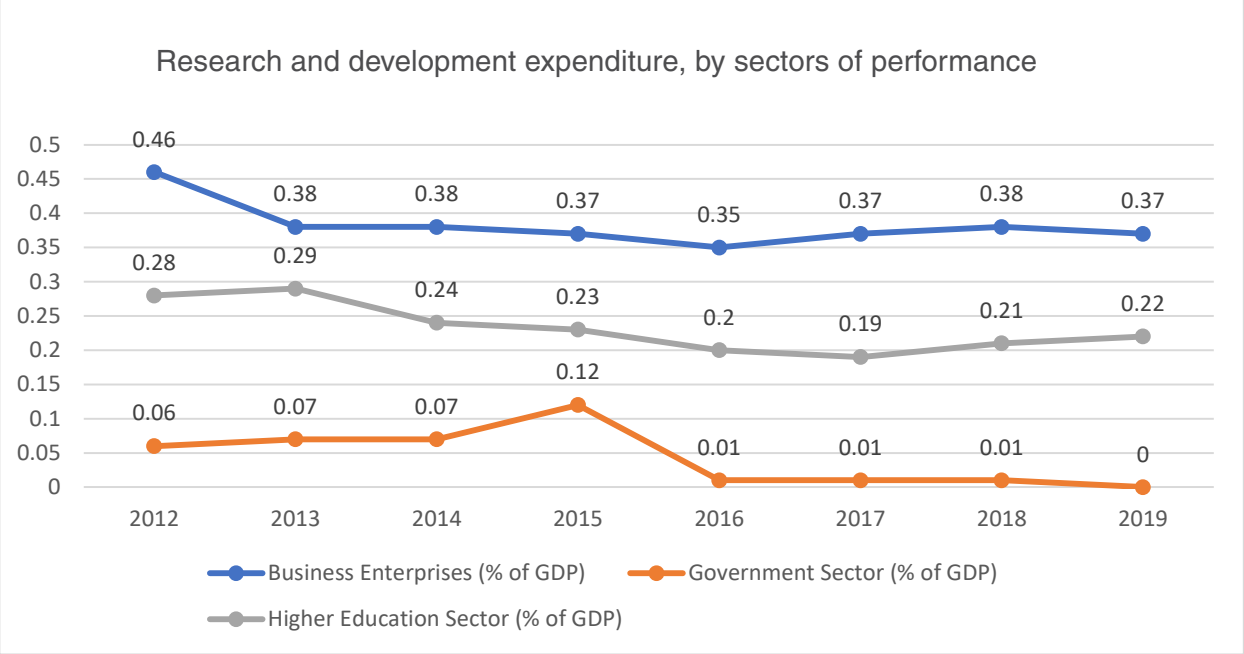
Similarly to the previous indicator, this figure was observed to decline from 51.22% to 33.90% from 2012 to 2016. However, the latest data for 2018 shows a notable increase of 12.54% in **Enterprises with innovation activities in the core NACE codes**.

2 PILLAR 1: Achieving a comprehensive R&I support ecosystem

This pillar in the National R&I Strategy highlighted the importance of developing an ecosystem of innovation driven growth by supporting and leveraging indigenous R&I and embedding a culture for innovation, creativity, risk-taking and entrepreneurship. Access and transfer of knowledge to further strengthen the capacity of local entrepreneurial actors to innovate, as well as a chain of support are also given importance in this pillar. This support is independent of thematic specialisations and provides a baseline level of support for all stakeholders.

Private R&D expenditure

	2012	2013	2014	2015	2016	2017	2018	2019
Business Enterprises (% of GDP)	0.46	0.38	0.38	0.37	0.35	0.37	0.38	0.37(p)



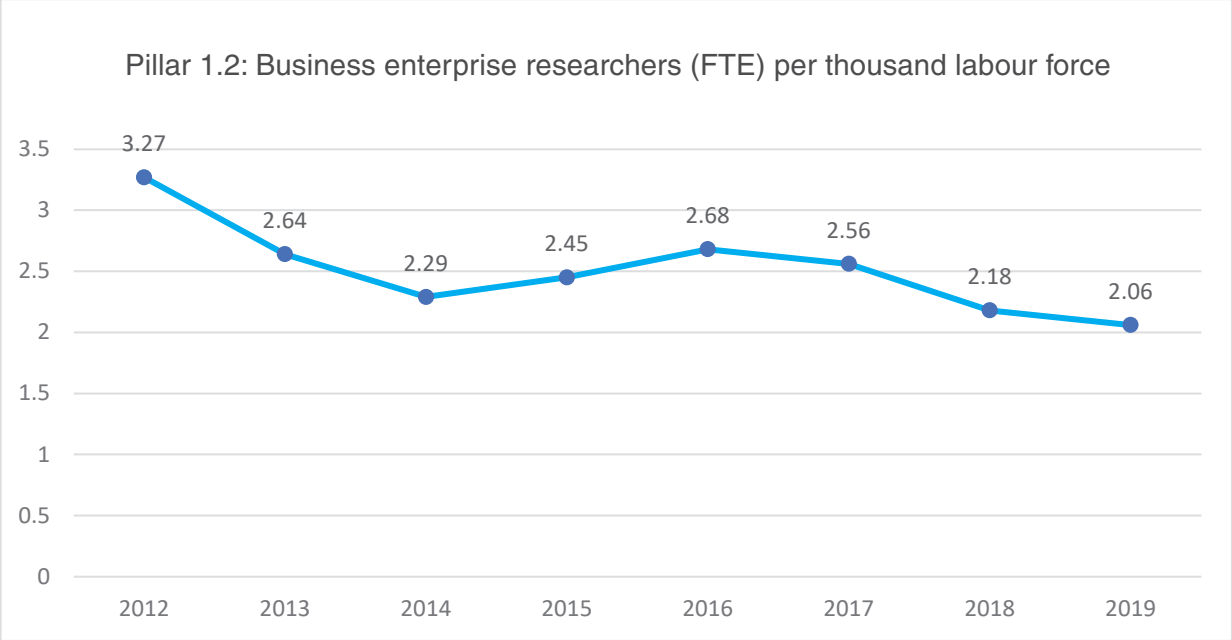
The **Research and Development expenditure in the Business Enterprise, Government and Higher Education** sectors has remained quite stable over the years with minor fluctuations being observed. The lowest performing sector for 2019 is Government, whilst the highest R&D expenditure was recorded in the Business Enterprise sector with a total expenditure of 0.37% (p) of the Gross Domestic Product, or €49.43 million Euro.

Total expenditure in innovation

	2014	2016	2018
€'000	85,737	192,760	175,031

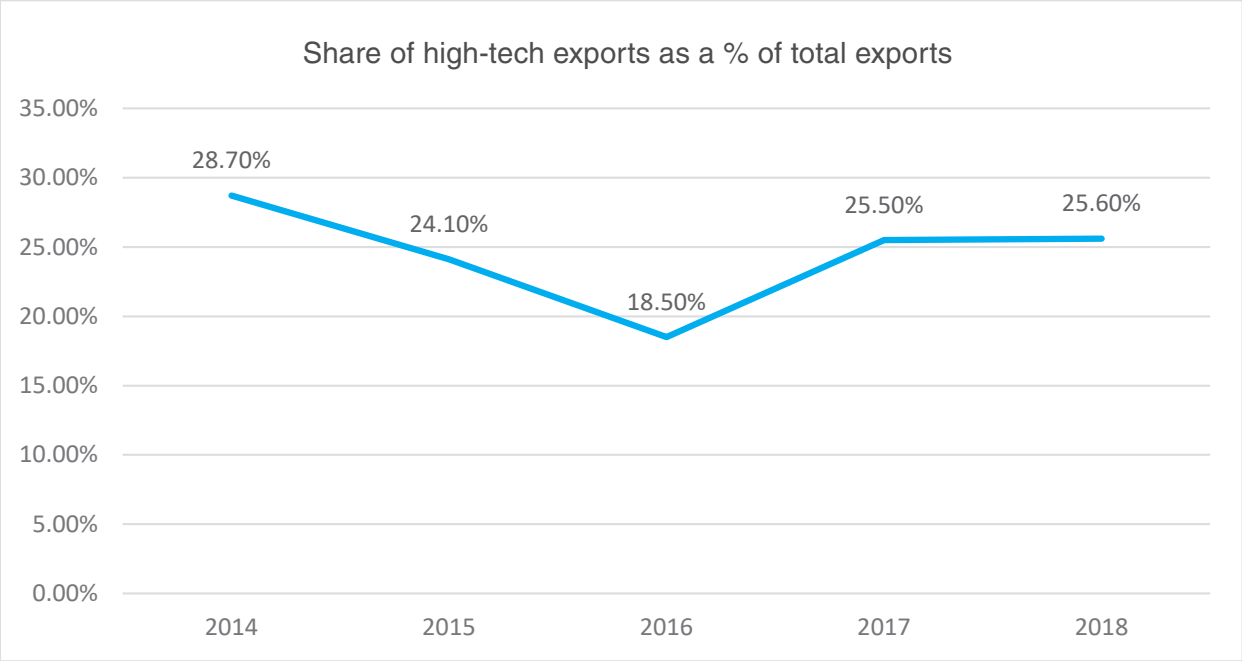
The **total expenditure in Innovation** measures the amount of money spent by the Business Enterprise sectors on product, process, organisational or marketing innovation. This figure, which is extracted from the Community Innovation Survey, increased significantly from €85,737 million in 2014 to €192,760 million in 2016; however a decrease in expenditure was recorded for 2018 (€175,031 million).

Number of researchers (full time equivalents or FTEs) per thousand labour force working within the private sector



From the above graph one can see that the **number of researchers working in the private sector** has been decreasing. In 2016 for every thousand persons in the labour force in Malta, 2.68 full-time equivalent researchers were employed in the private sector, whilst in 2019 there were 2.06. In real terms, the number of researchers has been fluctuating during this time, whilst the labour force has been steadily increasing.

Share of high-tech exports as a percentage of total exports



This indicator looks at the technological intensity of exports from Malta utilising high-technology aggregates which includes the manufacturing of pharmaceuticals and electrical components. The share **of high-tech exports** includes the manufacturing of pharmaceutical and electrical components. The data for this indicator shows an overall decrease of high-tech exports from 2014 to 2018 in comparison to total exports from Malta.

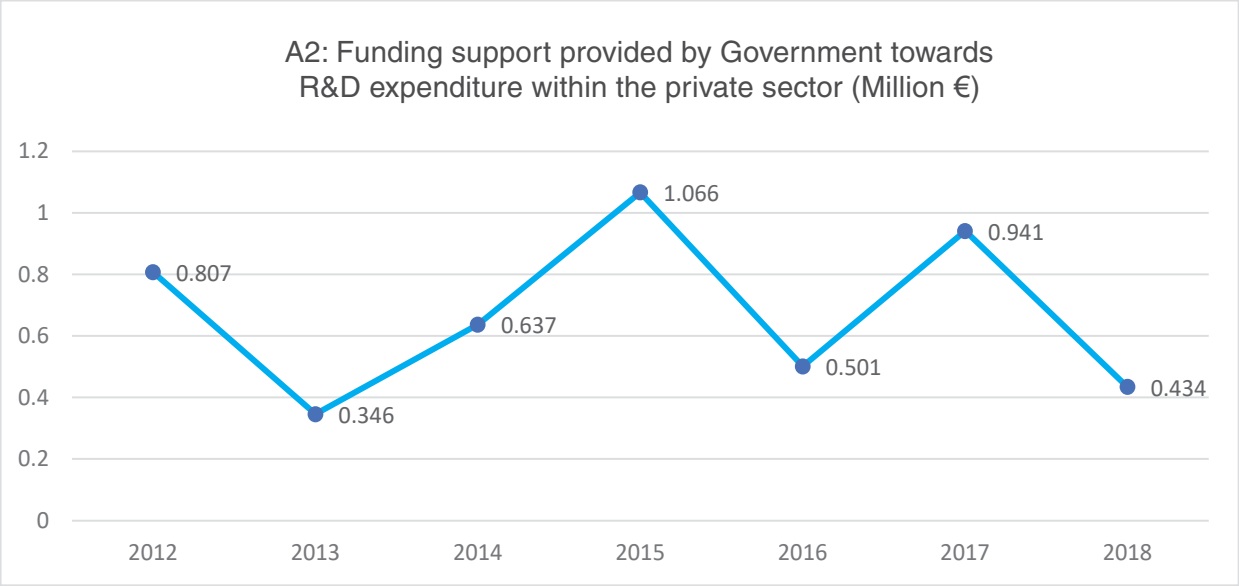
Action Line A

SMEs involved in R&D and innovation projects

	Enterprises with on-going innovation activities during 2016 and 2018 [INN_CIS11_INACT]	Enterprises with In-house or Contracted out R&D activities during 2016 and 2018 [INN_CIS11_INRD]
10 to 49 employees	125	70
50 to 249 employees	41	44

Data for **Small-to-Medium Enterprises involved in R&D and Innovation projects** was extracted from the Community Innovation Survey[2] (CIS) which is carried out every 2 years. The 2018 edition of the survey underwent structural changes with regards to the design of the survey and in defining the parameters of 'innovation'. In previous editions, 'innovation' was classified as 'product', 'process', 'marketing' and 'organisational' whereas now only two classifications are considered: 'product' and 'business process' innovations. Due to these changes in the CIS there is no past data available for this indicator.

Funding support provided by Government towards R&D expenditure within the private sector



Funding support provided by Government towards R&D expenditure within the private sector has been fluctuating since 2012 with a significant increase between 2013 and 2015 of €0.72 million. However, the average funding support from 2016 to 2018 was of €0.625 million.

2. The Community Innovation Survey (CIS) does not collect data on micro-enterprises.

Action Line B
Evaluation & Monitoring

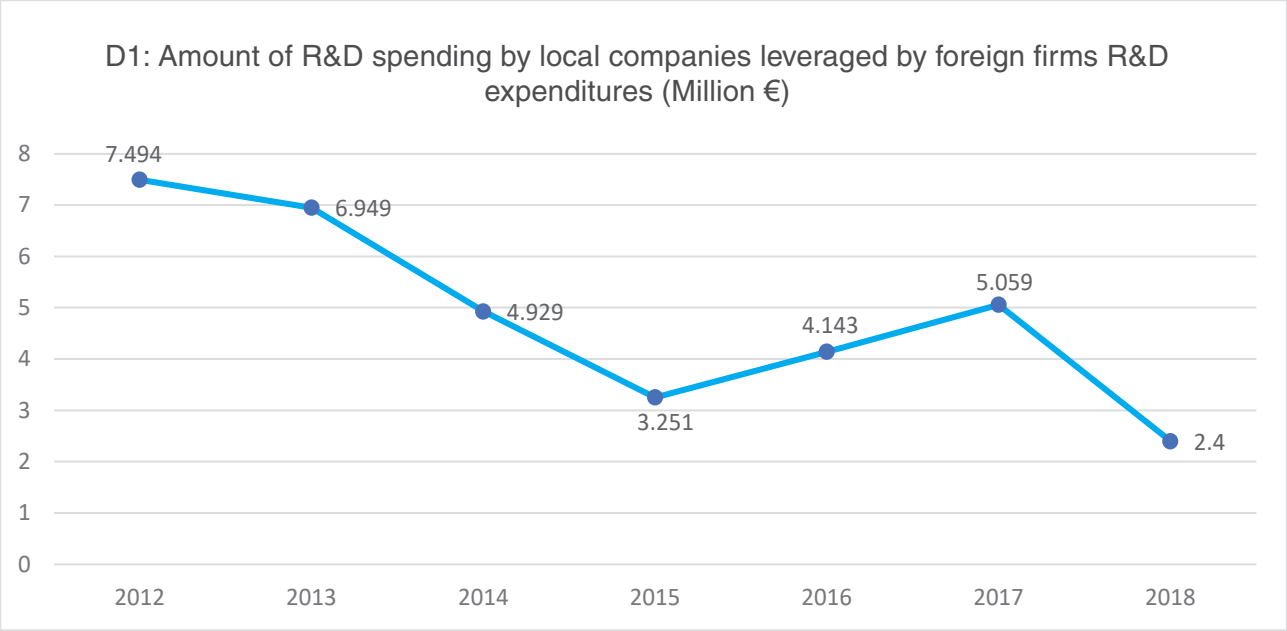
This Monitoring Report fulfils the objectives of this indicator and the content of the report feeds into the R&I policy-making process.

Action Line C
Global Competitiveness Index (GCI) Ranking

	2015-2016	2017	2018	2019
Ranking	40	36	36	38

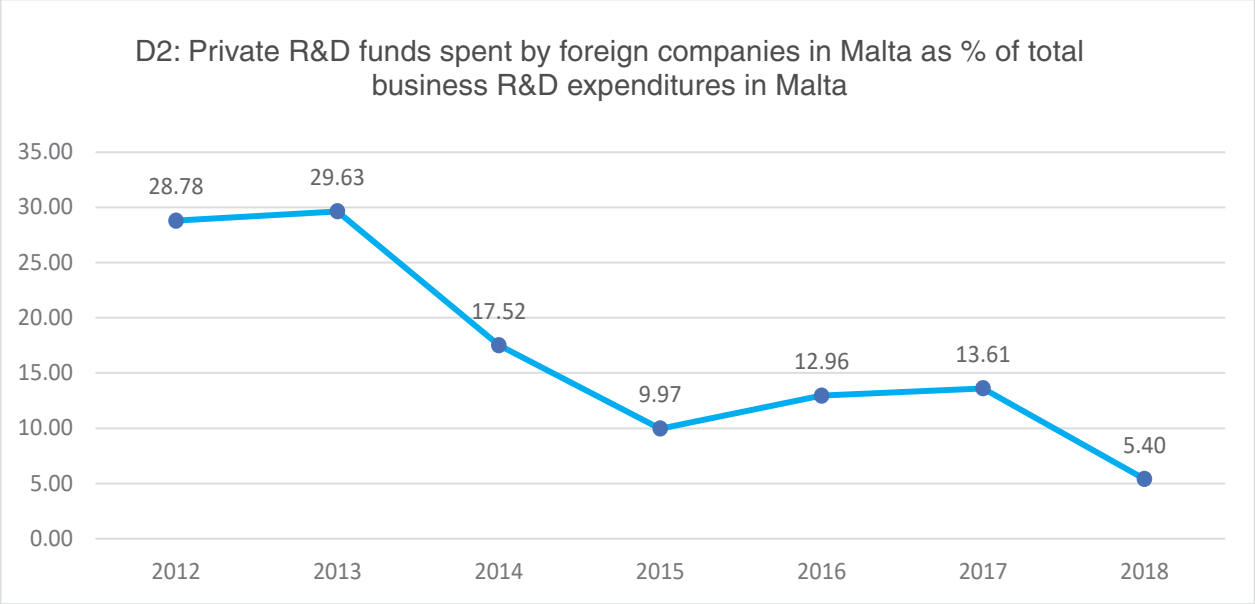
In the 2019 edition of The Global Competitiveness Report , Malta was ranked 38th out of 141 countries. In the performance overview, Malta ranked highest at 1st place in Macro-economic Stability and lowest at the 120th place in Market size. Malta also performed quite well in ICT Adoption and Health, ranking at 25th and 26th place respectively. The 2020 of the GCI report was a special edition, published during the outbreak of the Covid-19 pandemic. Countries were not ranked in this report however it was noted that Malta is one of the countries with relatively widespread access to healthcare which offers extensive medical support.

Action Line D
Amount of R&D spent by local companies due to leveraging funds from foreign firms



3. https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf

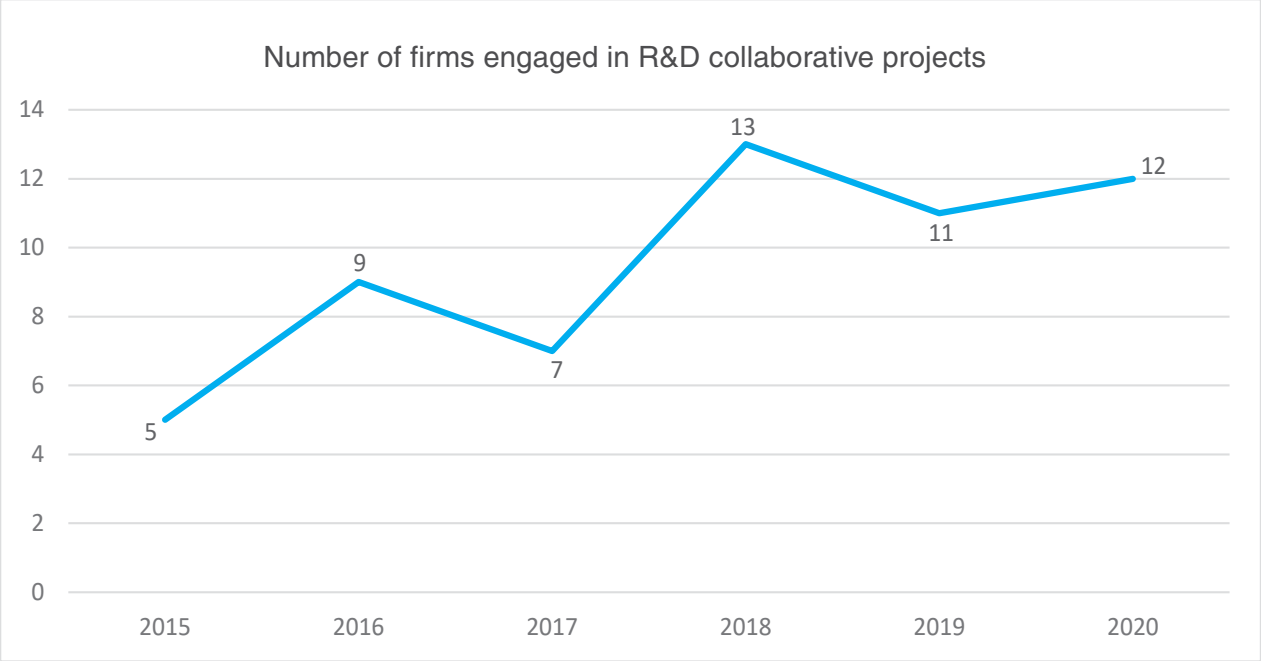
Private R&D funds spent by foreign companies in Malta as a percentage of the total business R&D expenditure in Malta



Both of above figures show a significant drop in expenditure in 2018. The **amount of R&D spent by local companies due to leveraging funds from foreign firms** showed a notable decrease from 2013 to 2015, increased till 2017 and subsequently decreased again in 2018. **Private R&D funds spent by foreign companies in Malta as a percentage of the total business R&D expenditure in Malta** also exhibited a similar trend.

Action Line E

Number of firms that engage in R&D collaborative projects



Data for the **number of firms that engaged in R&D collaborative projects** was collected directly from R&D funding programmes that are government subsidised and require a form of collaboration with other entities. The number of firms remained stable from 2015 to 2017, increased in 2018 and remained stable till 2020.

Action Line F

Number of formalised commitments taking place between public research organisations and business firms

2014	2015	2016	2017	2018	2019	2020
18	9	31	6	34	27	23

Data on the **number of formalised commitments taking place between public research organisations and business firms**[4] was collected from the University of Malta (UM) and the Malta Aquaculture Research Centre (MARC) and includes formal partnership agreements such as contracts, cooperative agreements, Memoranda of Understandings (MOUs) or Memoranda of Agreements (MOAs).

Number of spin-off companies

2015	2016	2017	2018	2019	2020
1	1	2	1	3	1

The **number of spin-off companies** has remained consistently low over the past 6 years.

Number of applications for co-patents by firms

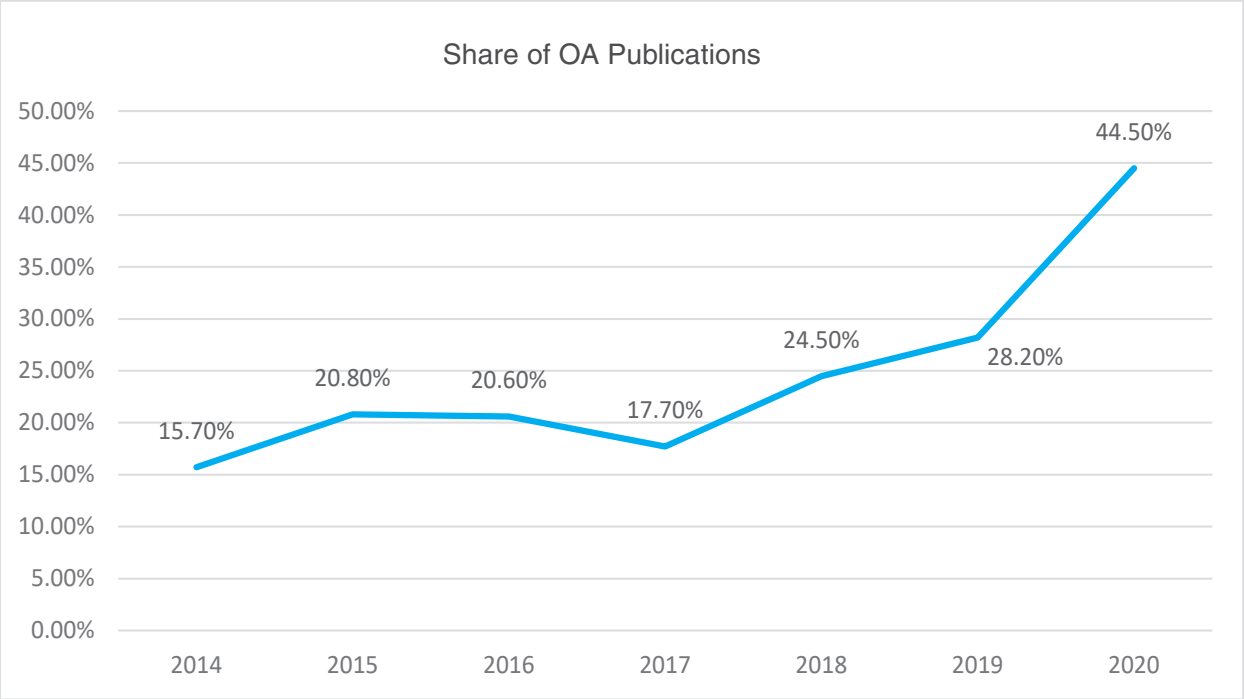
2014	2015	2016	2017	2018	2019	2020
2	3	0	0	0	0	1

The title of this indicator was changed from *number of patent applications to the European Patent Office (EPO) with foreign co-inventors by priority year* to **number of applications for co-patents by firms** since EPO data was only available till 2013. The updated figures in the table above were obtained from the Commerce Department within the Ministry for Economy and Industry. The number of co-patents remains low overall; there were no applications for co-patents were received from 2016 to 2019.

4. A data request for this indicator was sent to the Malta College of Arts, Science and Technology but no data was received.

Action Line G

Share of publications available in Open Access media as a percentage of total publications



The number of total publications has been steadily increasing from 2014 onwards, whilst the share of publications available in Open Access media as a percentage of total publications increased drastically by 16.28% from 2019 to 2020. In real terms, the number of Open Access publications more than doubled from 2019 to 2020.

Implementation of institutional repositories for Open Access publications

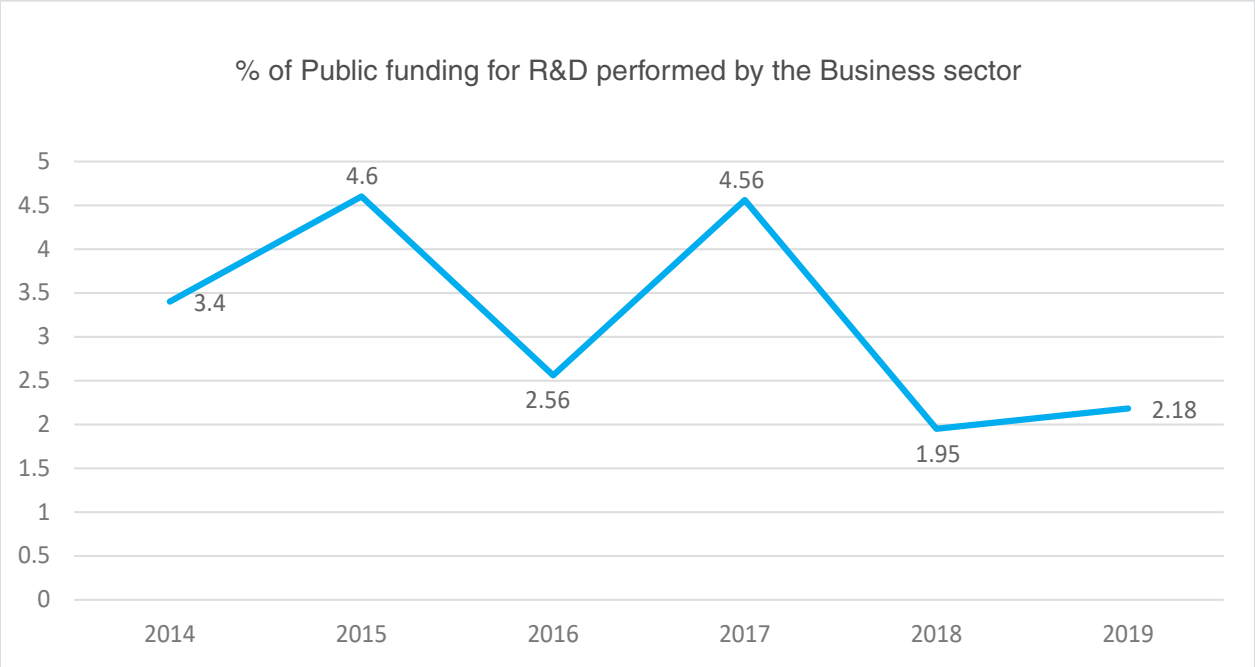
As of 2020, the University of Malta is the only academic entity that has **implemented an institutional repository for Open Access Publications** – OAR@UM. In 2017 UM implemented an Open Access Policy with the aim to support the research outputs of research at the university.

With regards to non-academic repositories, the Malta Library harvest, evaluate, verify and upload a number of documents from public content generating sources, such as ministries and entities, on their online public access catalogue. The documents on this site are freely accessible and on open access.

In the first quarter of 2022, the National Open Access Policy will be launched with the aim to improve the transfer of knowledge and research dissemination. The implementation of policy actions will also focus on upgrading and improving existing infrastructure and competences.

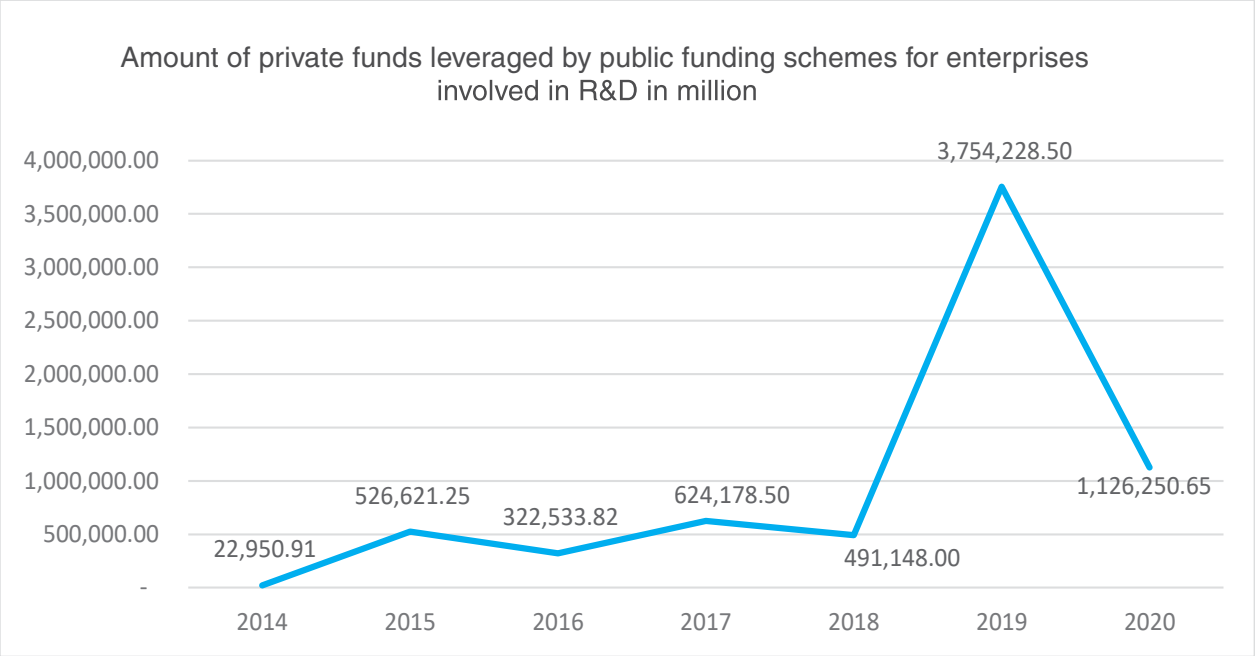
Action Line H

Percentage of public funding for R&D performed by the business sector



The **percentage of public funding for R&D performed by the business sector** can be observed to fluctuate from 2014 to 2019 with a notable decrease in 2018. The latest data shows a slight increase.

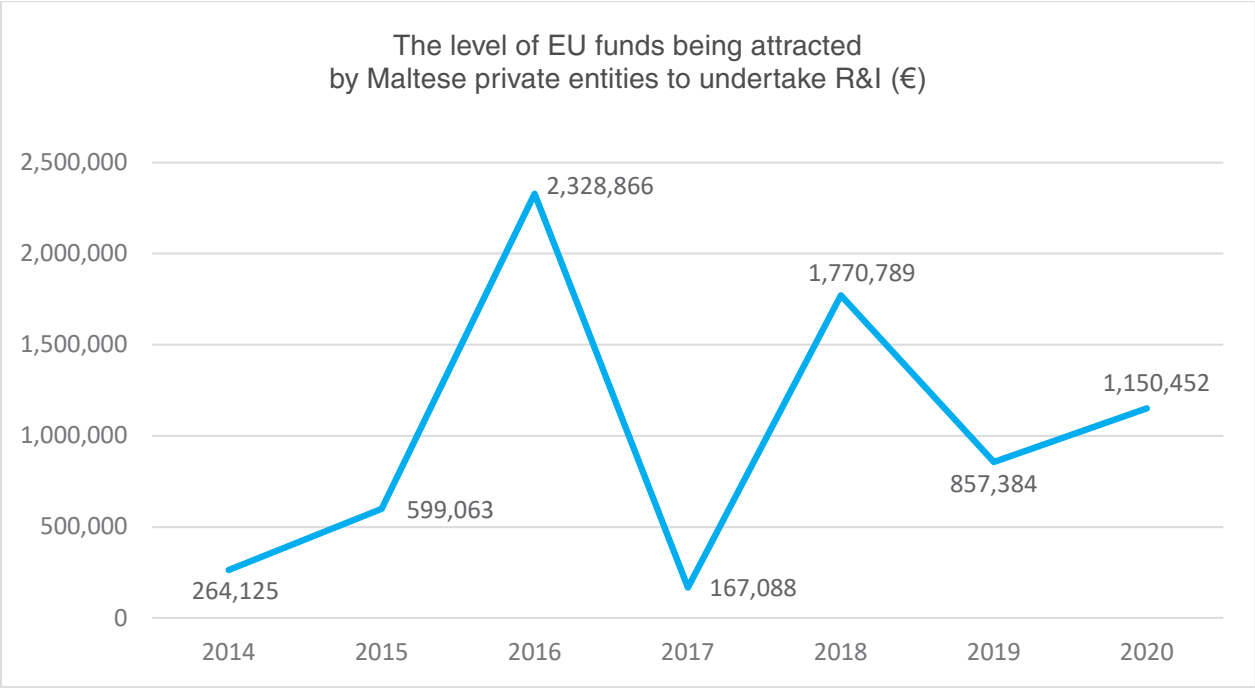
The amount of private funds leveraged by public funding schemes for enterprises involved in R&D in million €



This indicator measures the **amount of private funds leveraged by public funding schemes for enterprises involved in R&D** i.e. the 25% contribution from private enterprises participating in R&I funding programmes. The data for this indicator is observed to fluctuate from one year to the other; the rationale for fluctuations can include the fact that some funding schemes are run on a biennial basis.

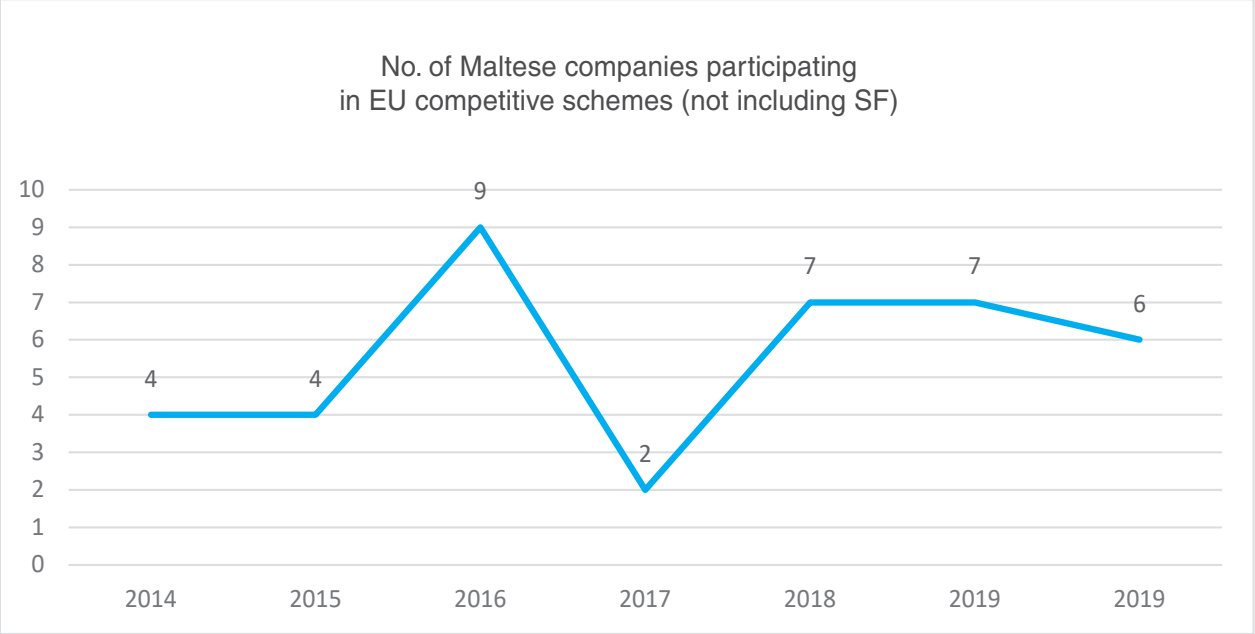
Action Line I

Level of EU funds being attracted by Maltese private entities to undertake R&I (apart from Structural Funds)



The **level of EU funds being attracted by Maltese private entities to undertake R&I** (apart from Structural Funds) includes funds awarded from the Horizon 2020 Framework Programme. The figures can be observed to fluctuate from 2014 to 2020 with a notable increase in 2016 followed by a significant decrease in 2017. The latest data shows less drastic fluctuations in the amount of Horizon 2020 funds awarded.

No. of Maltese companies participating in EU competitive schemes (not including SF)



Data on the **number of Maltese companies participating in EU competitive schemes** (not including Structural Funds) remained rather consistent from 2014 to 2020.

3 PILLAR 2: A Stronger Knowledge Base

Pilar 2 highlights the investment is a stronger knowledge base as a long-term investment. Some of the actions given priority in the pillar include; capacity building of human resources as well as research infrastructures as well as collaboration, internationally and across sectors of performance.

Global Talent Competitiveness Index (GTCI)

	2013	2014	2015/2016	2017	2018	2019	2020
GTCI Score	54.1	Malta was not included	54.53	57.43	58.77	59.1	62.02
Country Ranking	29		28	26	26	26	23

Malta has performed consistently well in the Global Talent Competitiveness Index (GTCI)[5] and placed 23rd overall in the 2020 edition of this publication. The GTCI ranks countries based on their ability and effort to Enable, Attract, Grow and Retain talent by analysing macroeconomic and country-level variables.

Malta was scored highest in the 'Retain' pillar which included indicators on sustainability and lifestyle; and was scored lowest in the 'Grow' pillar which included indicator on formal education, lifelong learning and access to growth opportunities.

5. https://www.insead.edu/sites/default/files/assets/dept/globalindices/docs/GTCI-2020-report.pdf

Adjusted Research Excellence Index

Extracted from JRC technical report The Adjusted Research Excellence Index 2020

2010	2011	2013	2016	2018
16.2	15.3	15.3	24.8	21.6

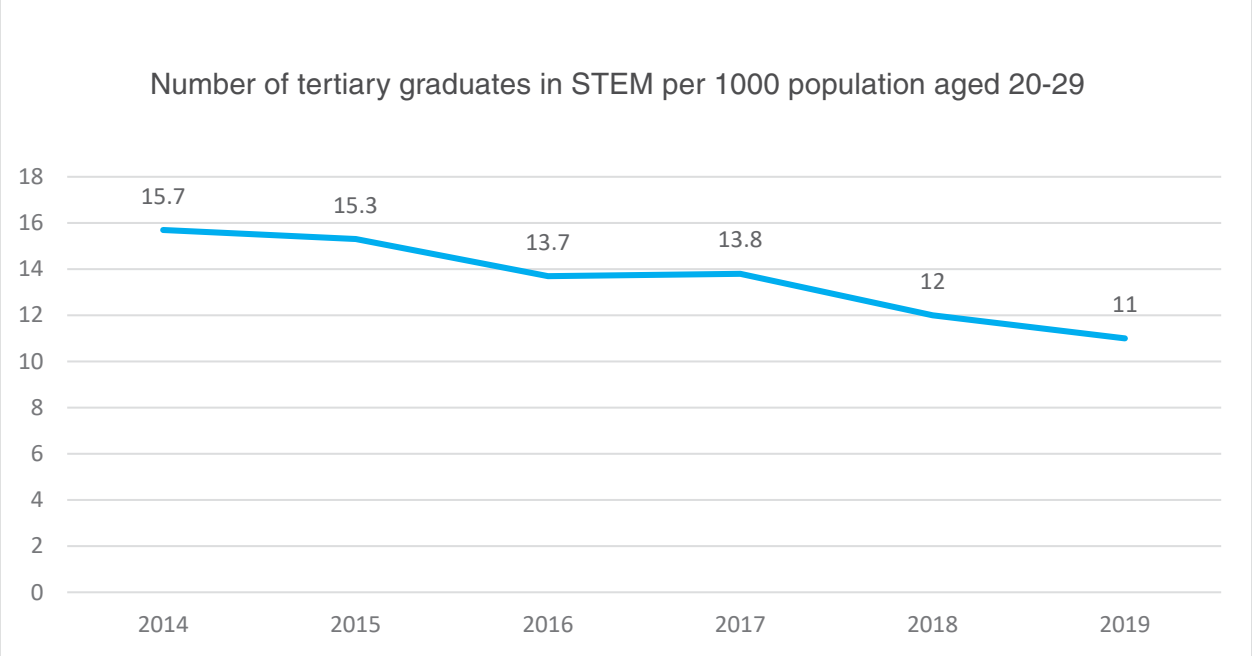
The Research Excellence index[6] is a composite of four components: share of top 10% most highly cited publications per total publications (data source: CWTS); Patent Cooperation Treaty (PCT) patent applications per population (OECD, World Bank); Participation in Marie Skłodowska-Curie Actions (DG-EAC); and European Research Council (ERC) grants per public R&D (DG-RTD, Eurostat, OECD).

A number of countries showed a decline in scores in the latest edition of the Research Excellence Index. This was noted in the methodology of the Index since in past editions growth was often driven by the overall increase in the value of ERC grants, which are now smaller. PCT patent applications data was also considered unreliable for Malta and Malta's final rank in the Index should not be taken at face value. An uncertainty analysis was carried out to test the methodology of the composite indicator development and a number of countries, including Malta, showed relatively volatile ranking.

6. https://publications.jrc.ec.europa.eu/repository/handle/JRC122029

Action Line J

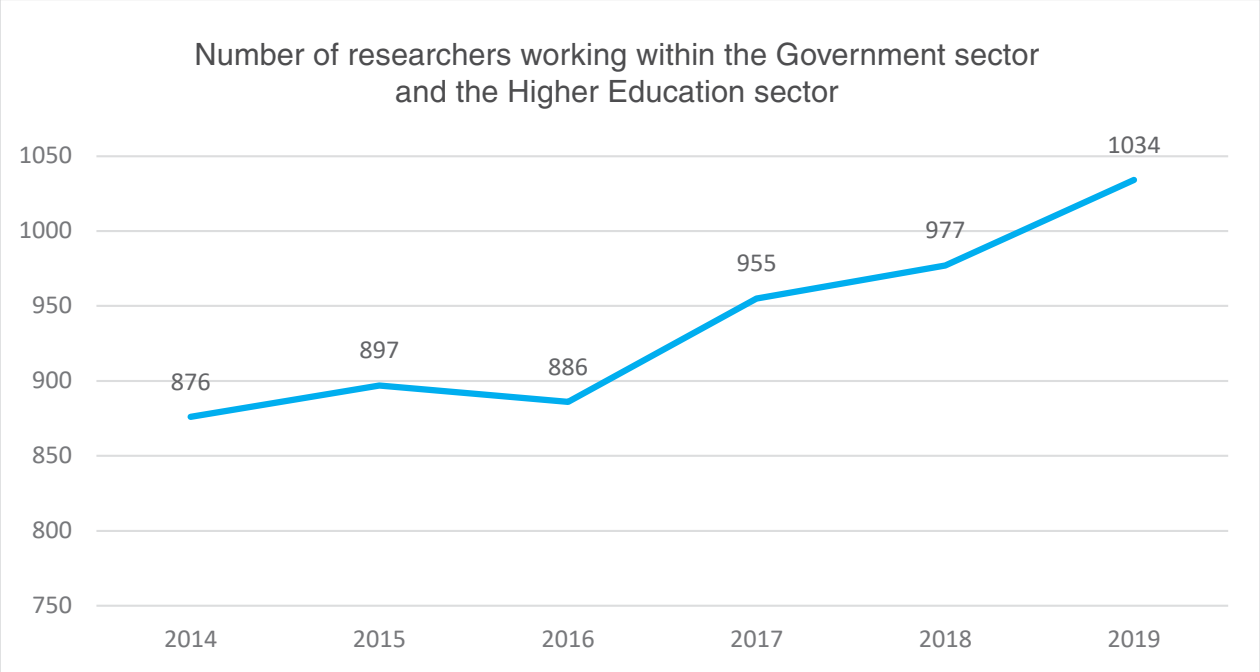
Number of tertiary graduates in STEM per 1000 population aged 20-29



The **number of tertiary graduates in STEM per 1000 population aged 20-29** decreased by 4.7 per thousand graduates from 2014 to 2019.

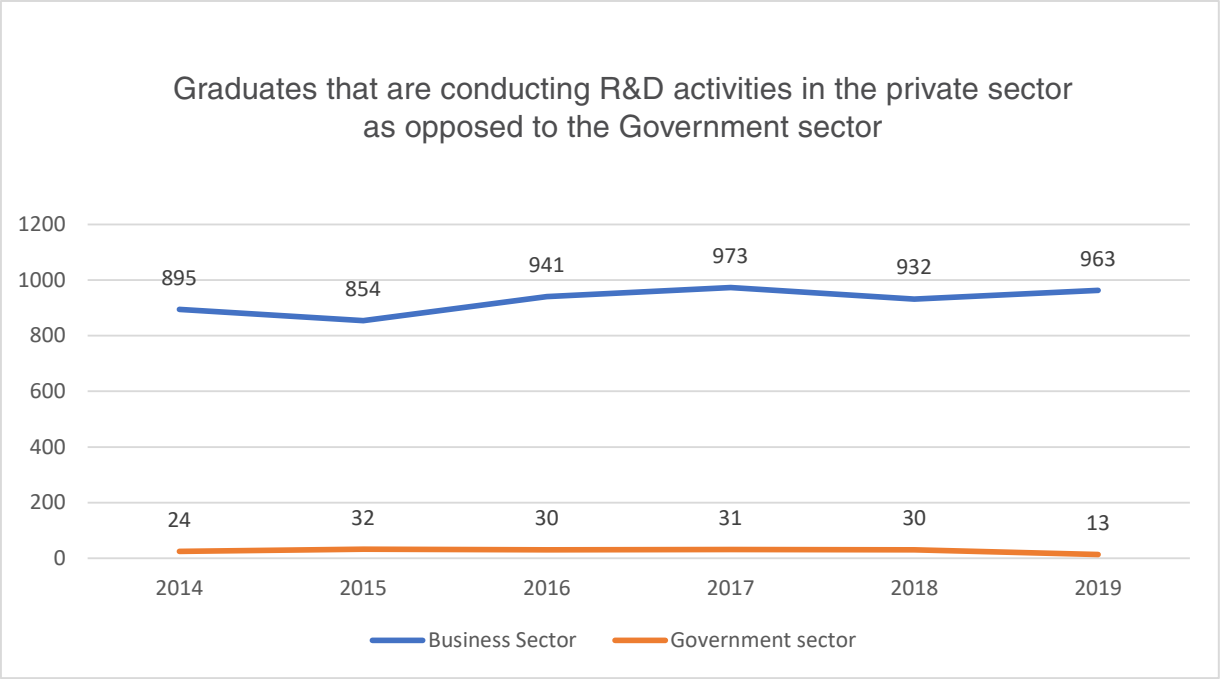
Action Line K

Number of researchers working within the Government sector and the Higher Education sector (mainly public sector)



The **number of researchers working within the Government sector and the Higher Education sector** gradually increased from 876 researchers in 2014 to 1034 in 2019. In real terms, the number of research within the Government sector is decreasing whilst the number of researchers in the Higher Education sector is increasing.

Graduates that are conducting R&D activities in the private sector as opposed to the Government sector



The number of **graduates that are conducting R&D activities in the private sector** increased from 2014 to 2017 and remained stable till 2019. **Graduates that are conducting R&D activities in the government sector** showed a slight increase in 2015 and remained stable till 2018, however the figures decreased notable in 2019.

Action Line L

Amount of public R&D financed by the private sector in million €

	2014	2015	2016	2017	2018	2019
Gov	0.25	0.16	0.16	0	0	0

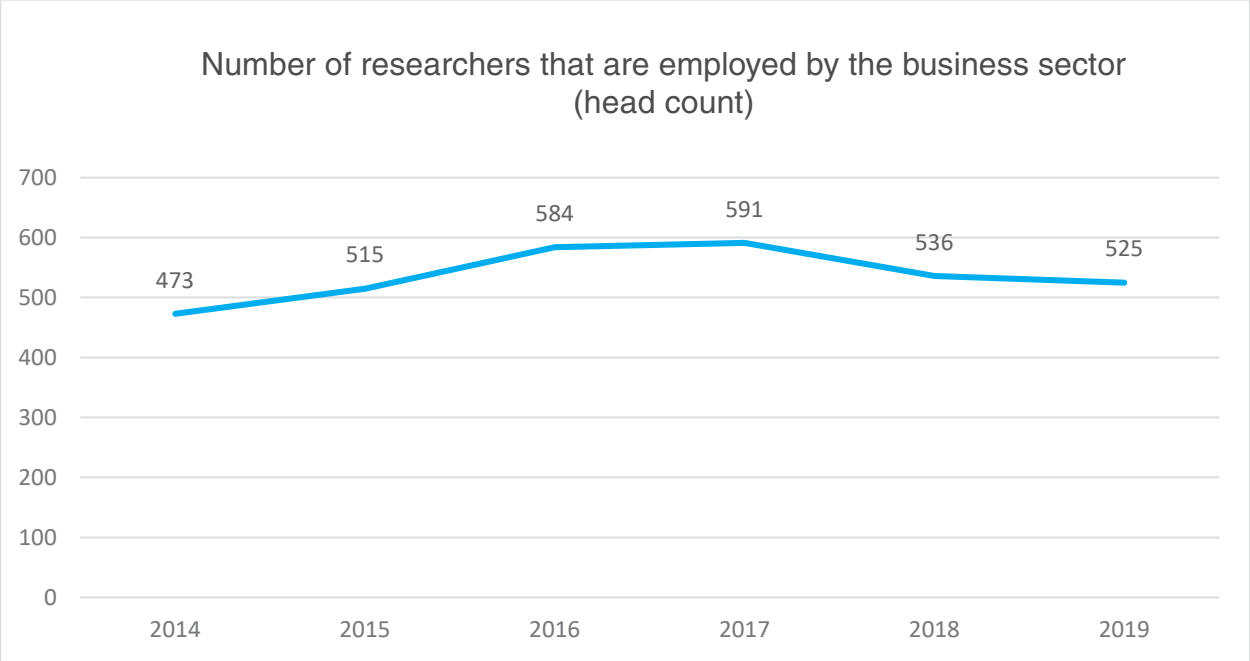
The **amount of public R&D financed by the private sector in million €** decreased from 2014 to 2019.

Number of Public- Private scientific co-publications per million population

2015	2018
4.7	23.1

A notable increase in the **number of Public- Private scientific co-publications per million population** was observed from 2015 to 2018. Data for this indicator is limited therefore no conclusions can be drawn.

Number of researchers that are employed by the business sector (head count)



The **number of researchers employed by the business sectors** increased from 2014 to 2017 and was observed to decrease in 2018 and 2019.

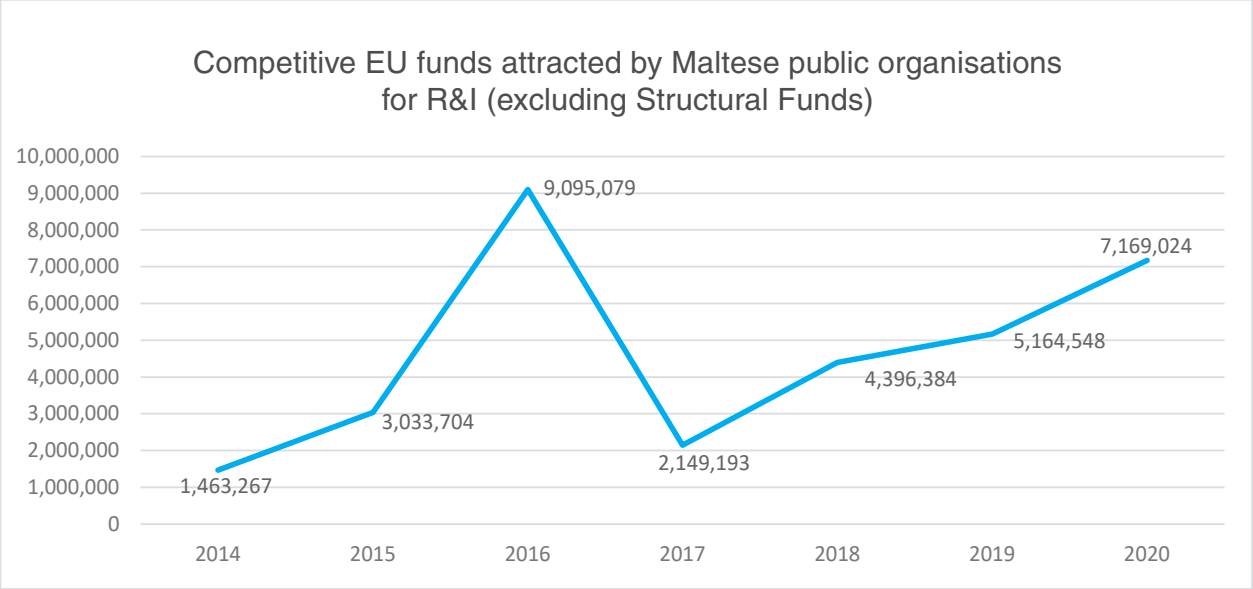
Number of innovative firms cooperating with research organisations

2006	2008	2010	2012	2014	2016	2018
3	3	4	Indicator not available	7	24	10

Data for this indicator was extracted from the Community Innovation Survey and shows a gradual increase over time. This may be indicative of a gradual increase overtime, however data needs to interpreted with extreme caution due to unavailability of data for 2012 and the possibility of 2016 being an outlier.

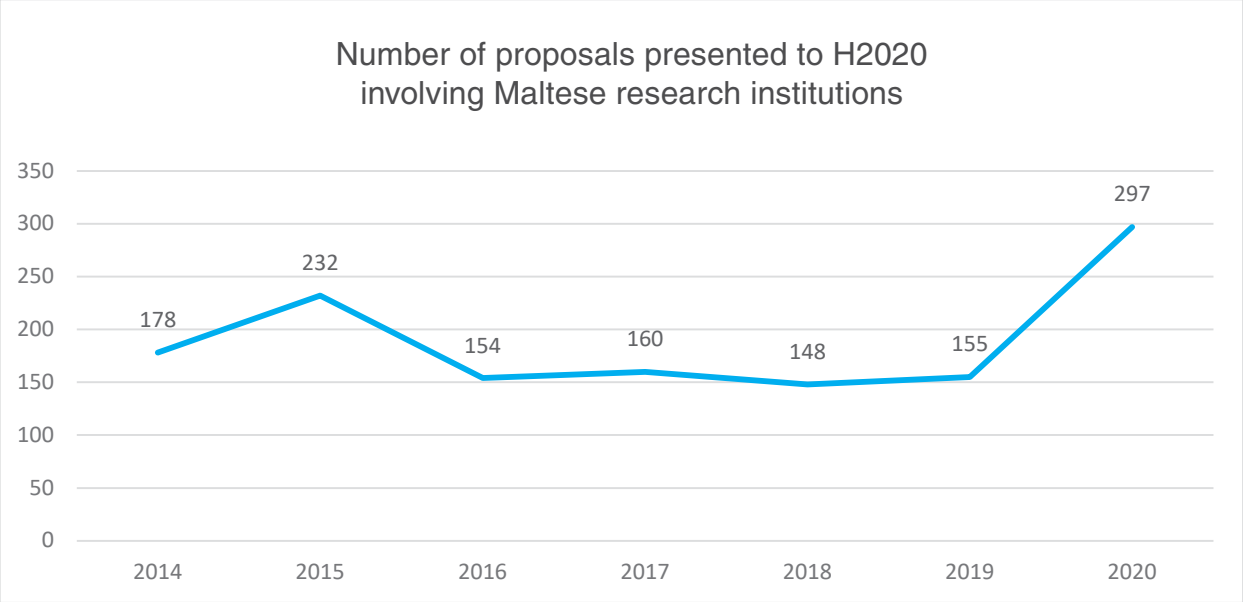
Action Line M

Competitive EU funds attracted by Maltese public organisations for R&I (excluding Structural Funds)



The amount of **competitive EU funds attracted by Maltese public organisations for R&I** (excluding Structural Funds) was observed to fluctuate between 2014 and 2017, however the amount of funds awarded continued to increase from 2017 onwards. The possible rationale for these fluctuations could be that since Horizon 2020 was launched in 2014, the first grant agreements were signed in 2016.

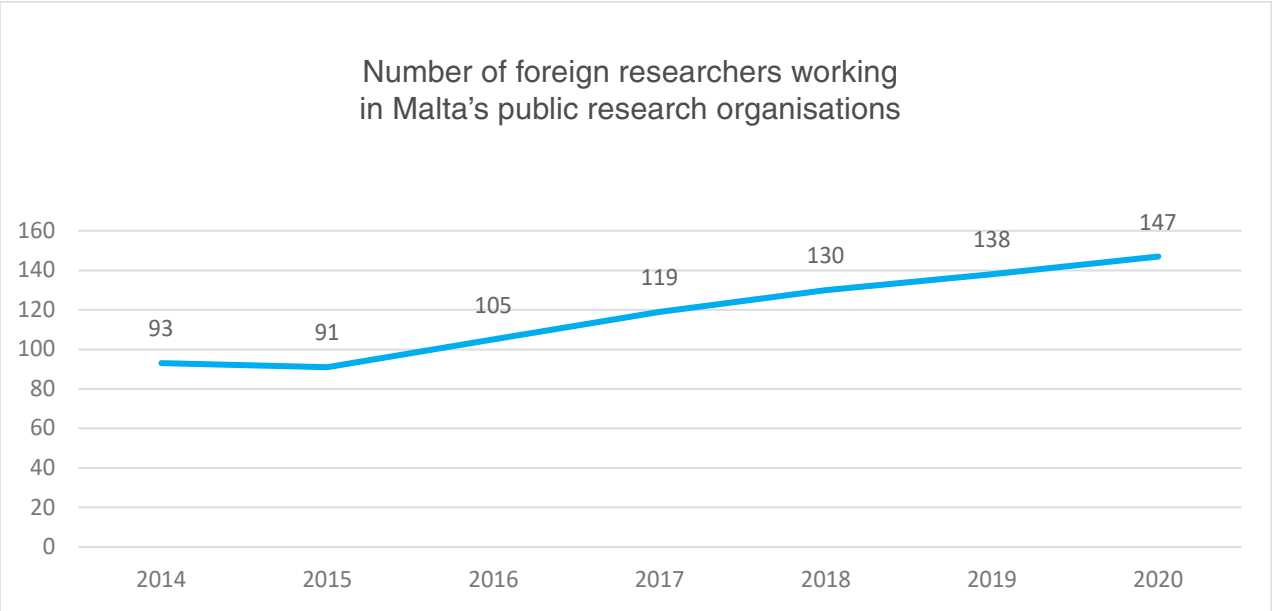
Number of proposals presented to H2020 involving Maltese research institutions



The **number of proposals presented to H2020 involving Maltese research institutions** increased form 2014 to 2015. This spike could be due to a number of reasons, however it should be noted that during this time Framework Programme 7 projects were being finalised which would have in theory freed researchers and entities to look into Horizon 2020 opportunities.

The number of proposals that decreased and remained stable from 2016 to 2019, and increased notably in 2020. This could be attributed to the fact that the Horizon 2020 budget for 2020 was around €13.5 billion; the largest annual budget that was available for calls.

Number of foreign researchers working in Malta's public research organisations



The **number of foreign[7] researchers working in Malta's public research organisations** has been continuously increasing from 2014 to 2020.

7. Includes EU and non-EU nationals

Action Line N

Survey to assess public understanding of science

A survey on the 'Perception and Attitudes towards Science' was commissioned by Esplora in 2014; a second survey was then conducted in 2019. The objectives of this survey were to:

- Gauge the general public level of awareness regarding science
- Provide an insight into science communication at local and national levels
- Understand the perception and attitudes of the general public with regards to science and science-related activities and/or initiatives (science awareness)
- Gauge the impact of science initiatives across different levels and parts of the community

The survey undertaken in 2019 also compared the results from 2014. It was noted that there was an improvement in perceptions of science and respondents expressed a higher level in interest in science; in 2019 64.1% of respondents stated that they are either very interested or rather interested in science. Respondents were also asked which area of science interested them the most and 47.3% mentioned health and 39.3% expressed interest in medical and pharmaceutical issues. Participation in science and technology related activities also increased, however certain demographics are still not convinced of the importance of science in everyday life.

Respondents also believe that government funding for scientific research should increase and that experts in their respective fields of science and technology should be given more exposure.

Action Line O

Percentage of scientific publications within the 10% most cited scientific publications worldwide when compared with the total scientific publications of the country

The RIO Report[8] was not longer published after 2016 and an alternate indicator is used in this report since data on the percentage of scientific publications within the 10% most cited scientific publications worldwide when compared with the total scientific publications of the country was available only till 2014. Latest data for number of scientific publications among the top 10% most cited is for 2016; figures show that publications amongst 10% most cited increased from 2010 to 2015, however data for 2016 shows a notable decrease.

Number of scientific publications among the top 10% most cited, in fractional counting.	2010	2011	2012	2013	2014	2015	2016
	5.90%	5.60%	5.40%	6.50%	7.60%	8.5%	4.00%

Action Line P

Rate of access of Maltese researchers to infrastructures part of ESFRI

This indicator seeks to capture the participation of Maltese researchers in ESFRI research infrastructures however due to limited data regarding participation in research infrastructures data is limited.

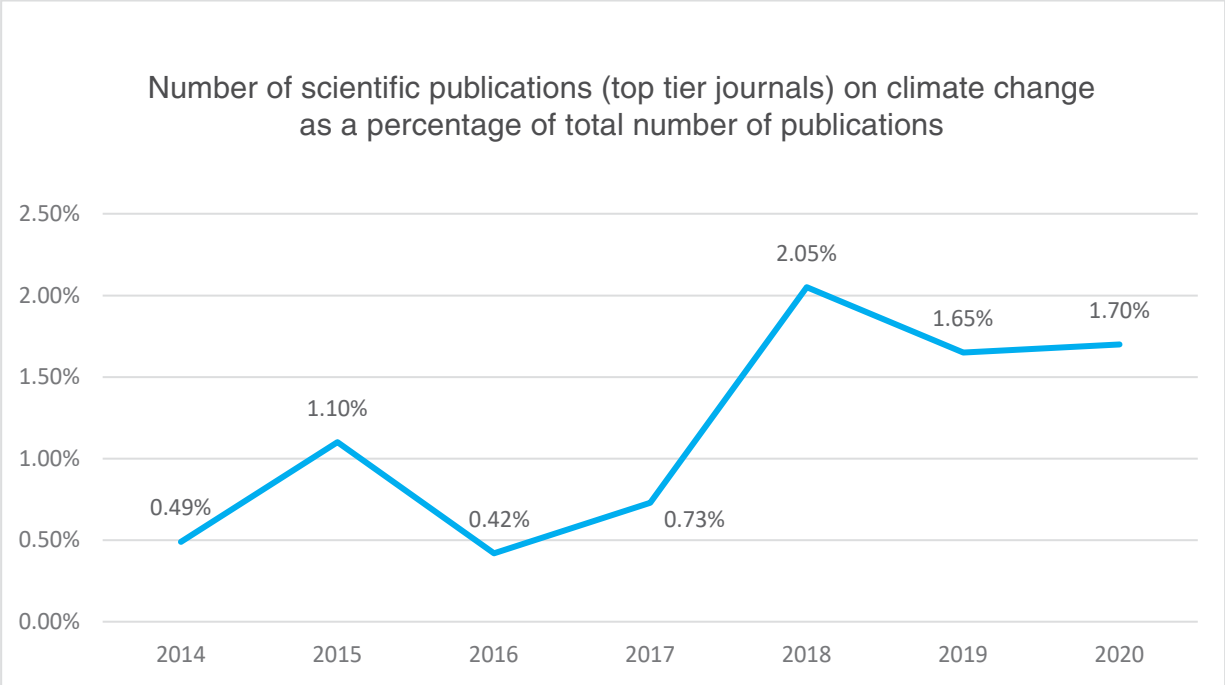
Malta joined the Biobanking and BioMolecular resources Research infrastructure (BBMRI) in 2013 and was established the Faculty of Medicine and Surgery within the University of Malta. The Malta National Node is the smallest within the BBMRI-ERIC but takes an active part in activities regarding quality measures and rare disease matters[9].

As of 2020 the Malta Node has supported 5 projects, and the top 3 areas of expertise were Rare Diseases, Globin research and Mitochondria. It also intends to pursue the development of a clinical biobank and a social co-operative for partners that lend samples and data for research and biobanking.

8. https://rio.jrc.ec.europa.eu/stats/country-based-indicators [RIO report is no longer available online]
9. https://www.bbmri-eric.eu/wp-content/uploads/Annual-Report-BBMRI-v05-20200707-for-website.pdf

Action Line Q

Number of scientific publications (top tier journals) on climate change as a percentage of total number of publications



The **number of scientific publications (top tier journals) on climate change as a percentage of total number of publications**[10] fluctuated from 2014 to 2017 and increased notably in 2018. The figure decreased in 2019 however latest data shows a further increase.

10. A data request for this indicator was sent to the Malta College of Arts, Science and Technology but no data was received.

4 PILLAR 3: Smart and Flexible Specialisation A Stronger Knowledge Base

Pillar 3 is dedicated to Smart Specialisation which is a business-driven process whereby efforts are concentrated towards sectors which have already achieved a level of potential within the local economy but require a more targeted approach to boost innovation activity. The identified Smart Specialisation areas for Malta for the 2014-2020 period were: Tourism product development, Maritime services, Aviation and aerospace, Health and Resource -efficient buildings. ICT was also identified as a crucial, cross-cutting area.

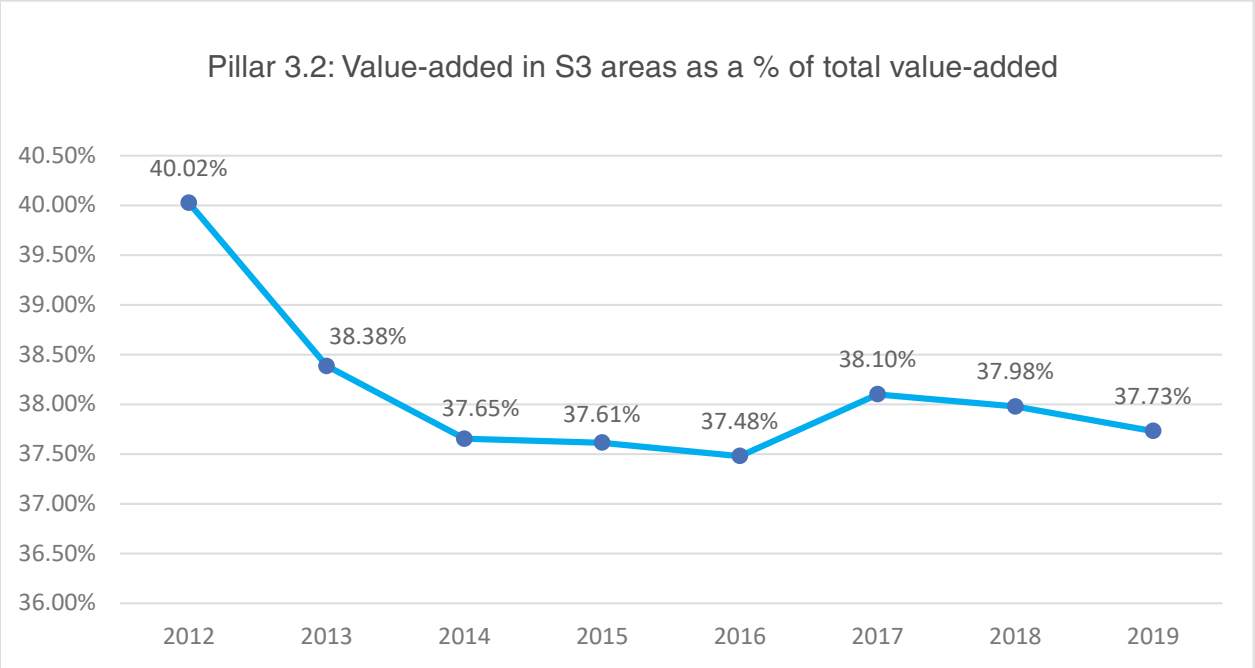
Value-added in knowledge-intensive activities as a share of total value-added

Data for total Knowledge Intensive Activities was only available for 2013, 2015 and 2018, therefore the value-added in knowledge-intensive activities as a share of total value-added could only be calculated for those 3 years. A substantial analysis could not be carried out due to the limited availability of data.

Time	2013	2014	2015	2016	2017	2018	2019
Total Knowledge Intensive Activities (Value added at factor cost - million €)	1,616.10	:	1,573.8	:	:	1,573.8	:
Total business economy repair of computers, personal and household goods; except financial and insurance activities (Value added at factor cost - million €)	3,861.90	4168.7	5,108.9	5512	6,645.3	6,636.6	7,197.8
%share	30.07	:	30.81	:	:	34.61	:

Data for total Knowledge Intensive Activities was only available for 2013, 2015 and 2018, therefore the **value-added in knowledge-intensive activities as a share of total value-added** could only be calculated for those 3 years. A substantial analysis could not be carried out due to the limited availability of data.

Value-added in S3 areas as a share of the total value-added



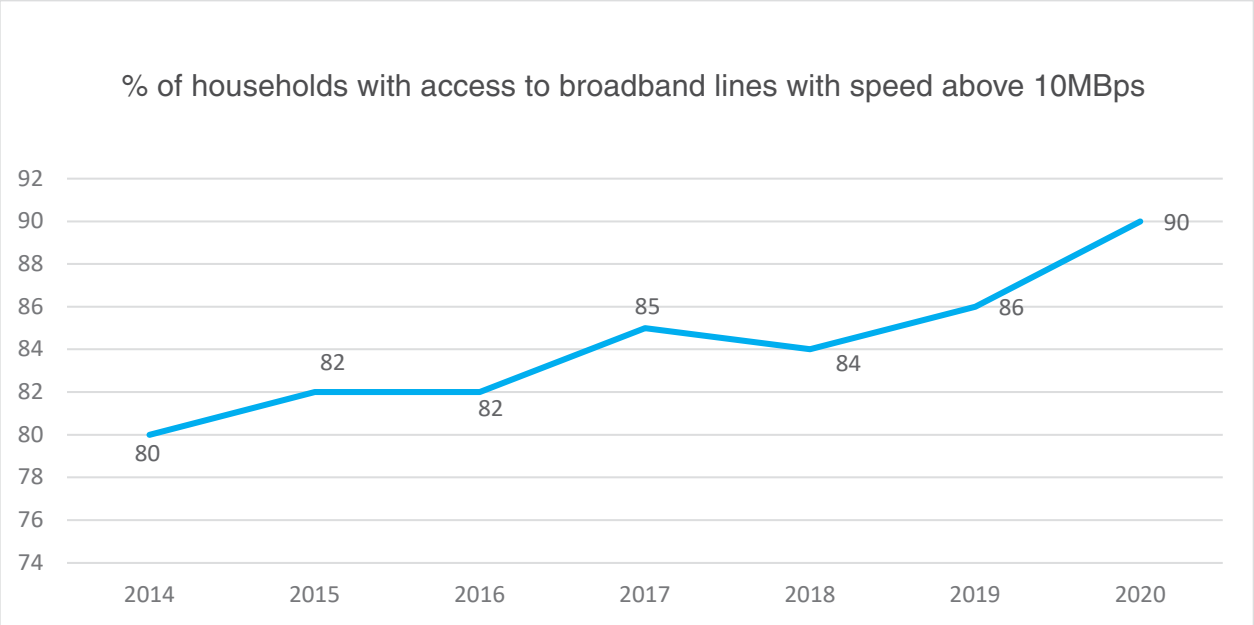
The **value-added in S3 areas as a share of the total value-added** showed a steep decline from 2012 to 2014 and remained stable till 2019.

Action Line R
percentage of SMEs using e-commerce

Time	2014	2015	2016	2017	2018
% of SMEs using e-commerce	19	19	20	18	22

As of 2018, 22% of **Small-to-Medium Enterprises used e-commerce solutions**. This represents a continuation of the status quo over previous years

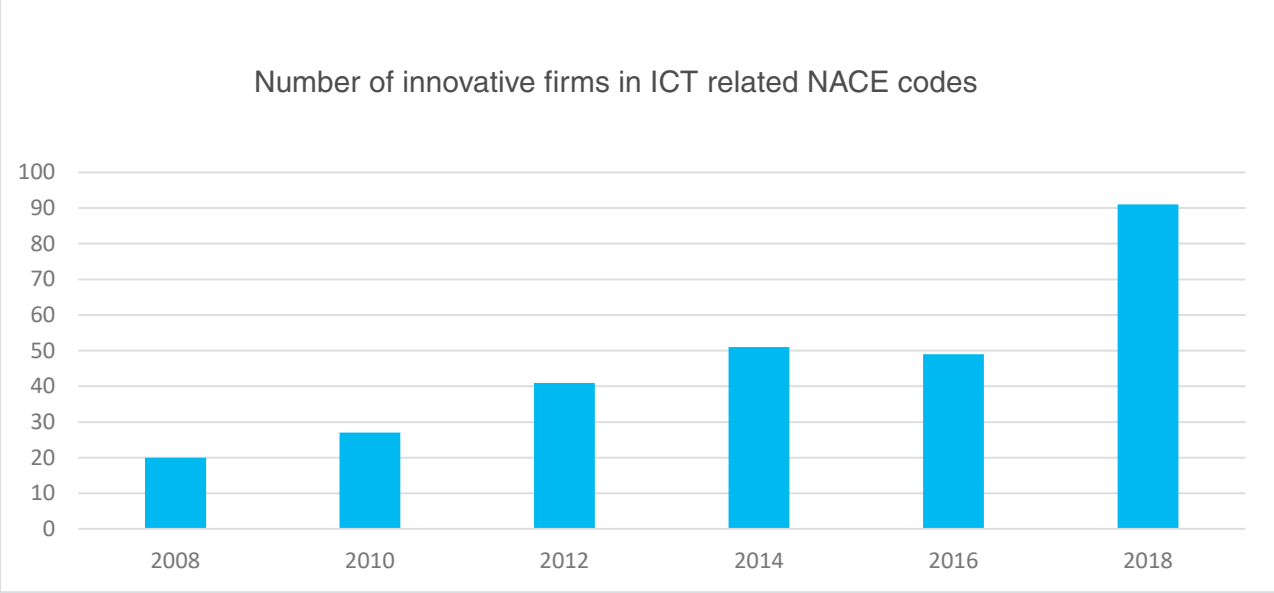
Percentage of households with access to broadband lines with speed above 10MBps



The percentage of households with access to broadband lines with speed above 10MBps shows a continuous positive trend and in 2020 90% of households in Malta had access to broadband.

Action Line S

Number of innovative firms in ICT related NACE codes



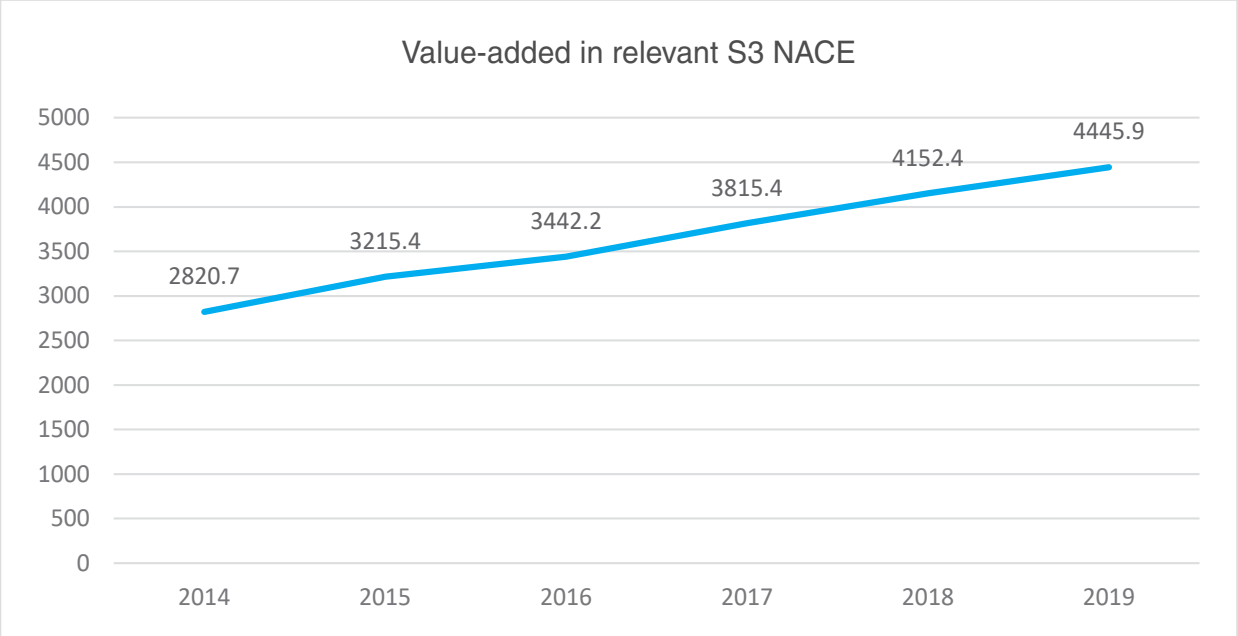
The **number of innovative firms in ICT related NACE codes** also shows a positive trend. The number of firms grew consistently from 2008 to 2014, decreased slightly in 2016 and increased by 42 firms in 2018.

Share of ICT in EU-funded research projects awarded to Maltese actors

	2014	2015	2016	2017	2018	2019	2020
In €	280,938	27,125	402,900	0.00	0.00	1,239,141	873,750

The **share of ICT in EU-funded research projects awarded to Maltese actors** can be observed to fluctuate from 2014 to 2020, with a notable increase in 2019. No funds for ICT related projects were awarded in 2017 and 2018.

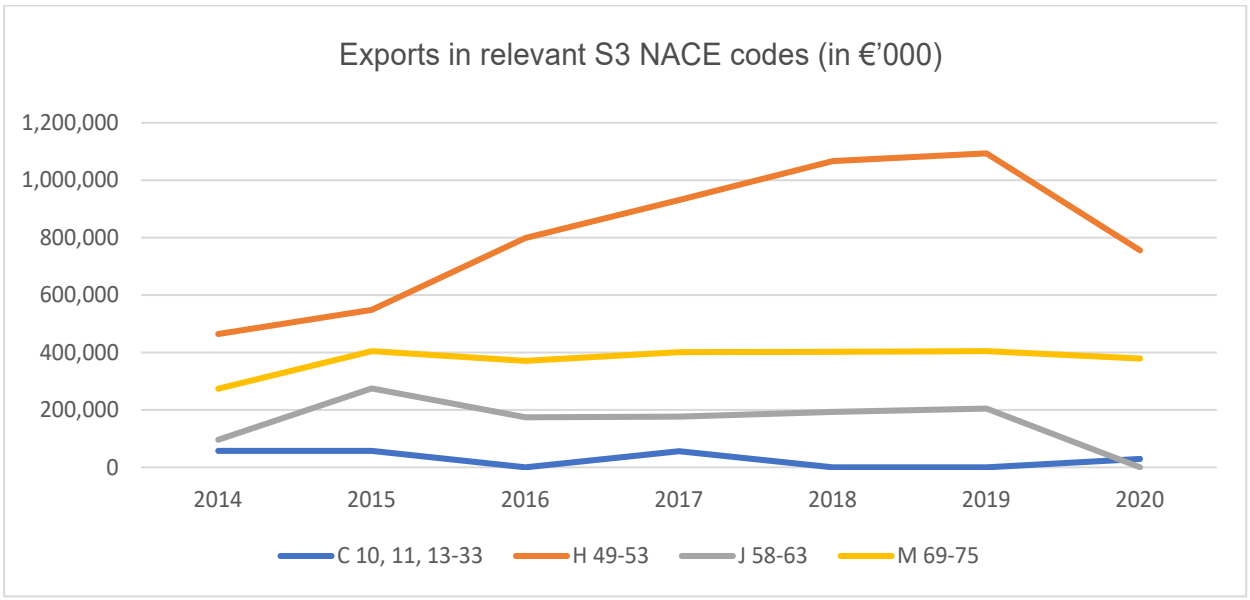
Action Line T - Z
Value-added in relevant S3 NACE (in million €)



The **value-added in relevant S3 NACE codes** shows a continuous positive increase from 2014 to 2019.

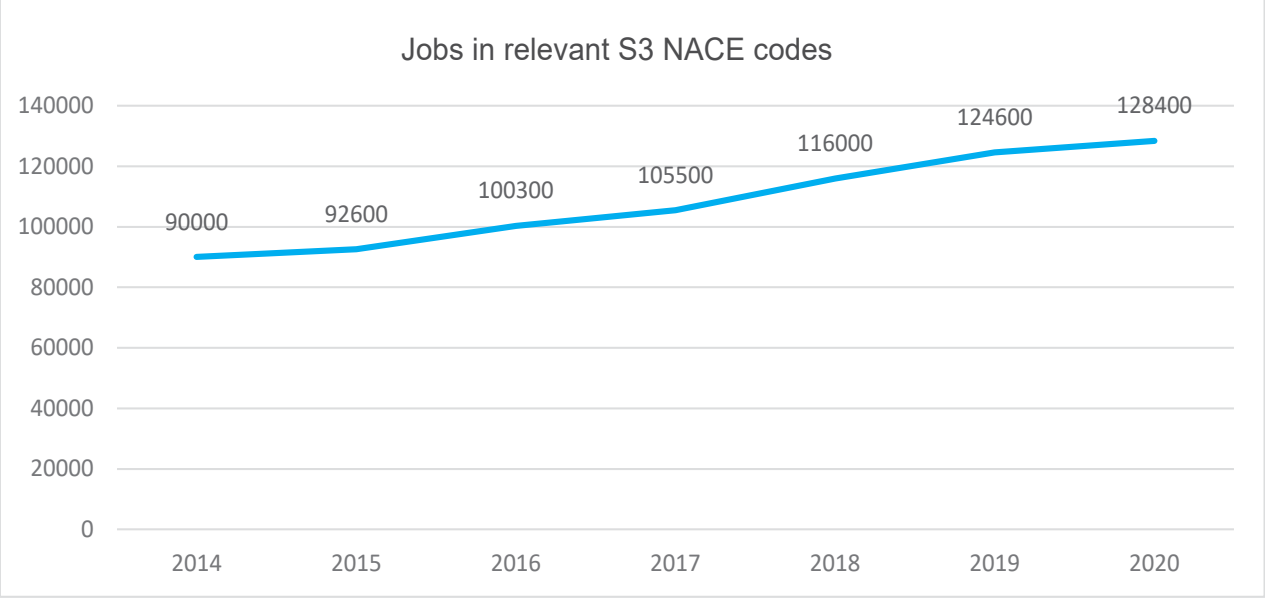
Exports in relevant S3 NACE codes

							€ '000
Total Exports	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
A 01-03	Conf	Conf	Conf	Conf	Conf	Conf	Conf
C 10, 11, 13-33	56,971	57,312	57,048	55,654	56,893	56,919	29,021
F 41-43	Conf	Conf	Conf	Conf	Conf	Conf	Conf
H 49-53	464,772	548,452	799,216	930,668	1,065,909	1,093,215	754,862
J 58-63	96,215	275,206	174,170	176,297	192,729	204,183	188,997
M 69-75	274,032	404,681	370,205	401,009	401,842	405,088	379,423



Data on **exports in relevant S3 NACE codes** was obtained from NSO. Due to confidentiality reasons some data was not available. The figures from 2014 to 2019 shows an increase in value of exports however the figures registered a decrease in 2020.

Jobs in the relevant S3 NACE codes



The data on the number of **jobs in relevant NACE codes** shows a positive upwards trend from 2014 to 2020.

Number of SMEs introducing innovation in relevant S3 NACE codes as a percentage of total SMEs introducing innovation

2014	2015	2016	2017	2018
14.08%	N/A	11.42%	N/A	15.03%

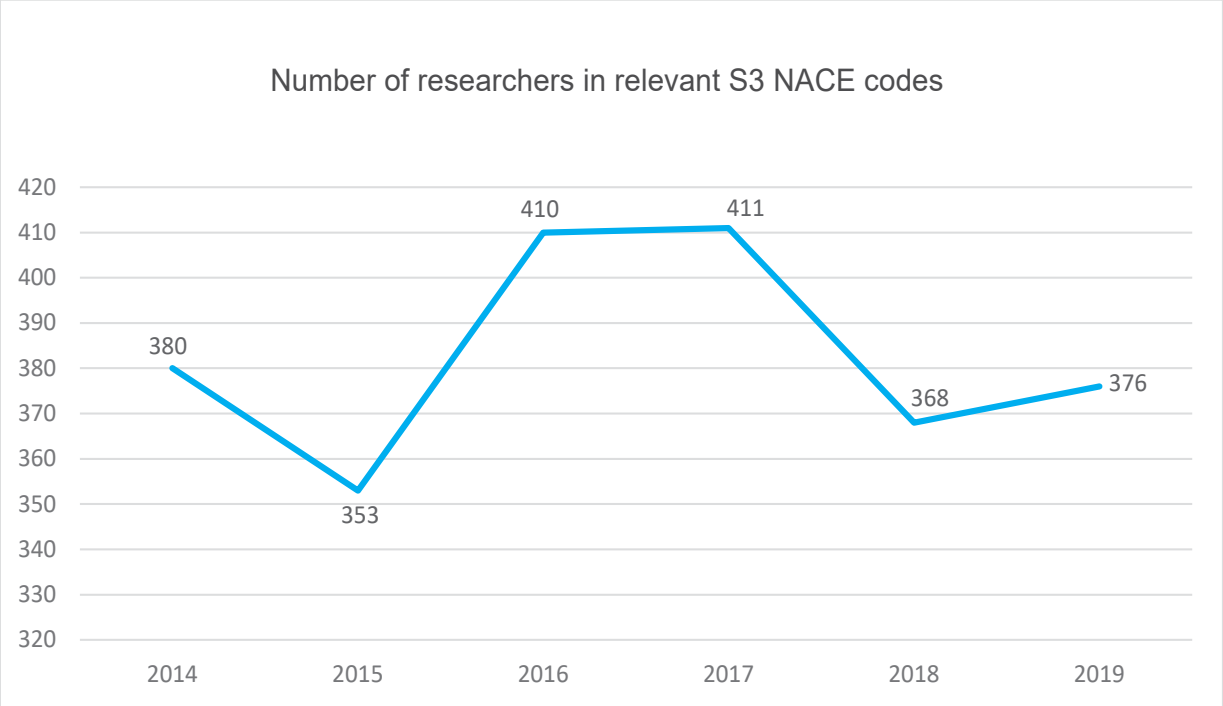
Dataset for the **number of SMEs introducing innovation in relevant S3 NACE codes as a percentage of total SMEs introducing innovation** is too small to draw any meaningful conclusions.

Turnover from innovation in relevant S3 NACE codes as a percentage of total turnover

2014	2015	2016	2017	2018
28.84%	N/A	17.76%	N/A	35.05%

The **turnover from innovation in relevant S3 NACE codes as a percentage of total turnover** dataset is too small to draw any meaningful conclusions.

Number of researchers in relevant S3 NACE codes



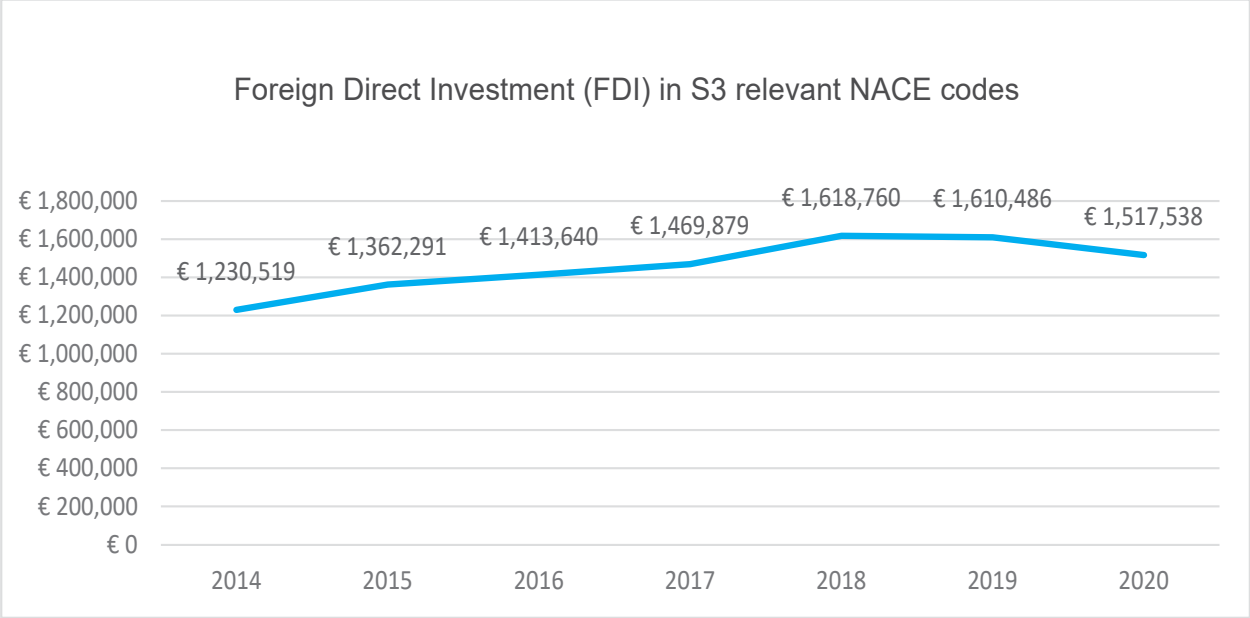
Data representing the **number of researchers in relevant Smart Specialisation Strategy NACE codes** shows that figures has been fluctuating. From 2014 to 2015 the figure decreased and then increased notably in 2016 and remained stable till 2017. Another notable decrease was observed in 2018 however data for 2019 shows a positive upwards trend.

Number of patents that were filed under the relevant S3 NACE codes

2014	2015	2016	2017
3.5	0.333	5.625	4.866

Data on the **number of patents that were filed under the relevant S3 NACE codes** was extracted from Eurostat and latest available figures were for 2017.

Foreign Direct Investment (FDI) in S3 relevant NACE codes



The amount of **Foreign Direct Investment (FDI) in S3 relevant NACE codes** shows a positive upwards trend from 2014 to 2018. In 2020 the figure decreased by €101, 232.

5 Conclusion

Headline Indicators

The picture that emerges from the headline indicators is one of increasing divergence between the human resource capacity for R&I and the surrounding enabling environment. Indeed, the targets for number of PhD holders and number of researchers have been met and surpassed. Therefore, in terms of building the capacity of human resources in science and technology, Malta has shown a steady improvement since 2014. On the other hand, the 2% Gross Expenditure on R&D target has been missed by a very wide margin (the latest figure for R&D intensity is 0.61%). Over the past years, GDP values have been increasing at a faster rate than R&D expenditure, indicating that Malta's economic growth was not based on or stemming from R&D investment.

Regarding the headline indicators on innovation expenditure, employment in knowledge-intensive activities and enterprises with innovation activity, the respective targets were also not met, indicating a business environment which is largely shying away from investing in more knowledge intensive activities and innovation, possibly due to a lack of foreseen urgency to innovate.

Pillars 1 and 2

The data presented for Pillars 1 and 2 of the Strategy indicates that R&I investments remain low, resulting in a lack of dynamism in the national R&I system. This makes it harder to attract new entrants (whether local start-ups/spin-offs or FDIs) and may impact Malta's competitiveness in the medium to longer term. The attractiveness of Malta's R&D and innovation ecosystem has indeed repeatedly emerged as one of Malta's Achilles' heels. Having said this, a number of positive trends can be noted in the number of foreign researchers and the attraction of EU funds in public research organisations.

Pillar 3

The available data gives an overall picture of improved performance linked to the overall improvements in the economy, without a clear additionality for RIS3 areas. While RIS3 is a conditionality for accessing structural funds, a more concerted approach in terms of funding and policies directed towards RIS3 areas might yield a higher impact on outcome indicators related to the identified RIS3 areas.

Recommendations for the Monitoring System

Data collection has become further streamlined compared to the first edition of this report. However, issues persist with regards to the Community Innovation Survey, such as small datasets, structural changes in the survey and no data for micro-enterprises and for the health sector.

This is the final R&I monitoring report which will utilise this monitoring framework due to the 2014-2020 programming period coming to an end. Lessons learnt during the compilation of this monitoring framework and respective reports will feed into future R&I monitoring frameworks. Improved monitoring mechanisms and better indicators that give a more complete picture will be given their due importance, as well as data availability and reliability. MCST will also be looking to access more sources of data to substantiate its evidence-based policy making in order to fulfil its role as the Maltese entity responsible for advising government on R&I.

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