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# RIO Country Report 2016: Malta

*Research and Innovation Observatory country reports series*

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**Research and Innovation Observatory Country Report 2016 Malta**
The 2016 series of the RIO Country Report analyses and assesses the development and performance of the national research and innovation system of the EU-28 Member States and related policies.
It aims at monitoring and evaluating the EU policy implementation as well as facilitating policy learning in the Member States.

**Contents**

## Foreword

This report offers an analysis of the R&I system in Malta for 2016, including relevant policies and funding, with a particular focus on topics of critical importance for EU policies. The report identifies the main challenges of the Maltese research and innovation system and assesses the policy responses implemented. It was prepared according to a set of guidelines for collecting and analysing a range of materials, including policy documents, statistics, evaluation reports, websites, etc. The quantitative data are, whenever possible, comparable across all EU Member State reports. Unless specifically referenced all data used in this report are based on Eurostat statistics available in January 2017. The report contents are partly based on the RIO Country Report 2015 (Warrington, Hristov, 2016).

## Acknowledgements

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# HIGHLIGHTS

- Malta showed an impressive real GDP growth rate of 6.2% in 2015.
- Government debt has been improving and fell to 64% of GDP in 2015.
- The budget deficit has been reined in, decreasing from 3.6% of GDP in 2012 to 1.4% in 2015.
- Forecast for coming years is optimistic.
- Maltese R&I system is centralised, without a regional dimension. The governance is simple and stable, with well-defined responsibilities and few changes to the relevant structures over the years.
- Despite the remarkable economic growth, in the last 2 years GERD has almost stagnated and has not kept up with GDP growth.

## MAIN R&I POLICY CHALLENGES

- **Improving the quality of the science base.** Significant progress has been made in the field of research infrastructures, with plans for further development in coming years. Grant schemes for doctoral and post-doctoral researchers have also been introduced and were successfully implemented. However, the scale of such funding remains modest. This could impact the research opportunities for the growing researcher pool and the full exploitation of the significant investments made in research infrastructures.
- **Increasing R&I investment.** The public R&D funding system has improved in recent years, both in terms of funding levels and variety of policy instruments to encourage R&D activity. However, the level of public funding for R&D remains very low. The entire funding system is dependent on EU structural funds, leading to disruption in the availability of funding at the changeover from one programming period to the next. There is as yet no account of how the target GERD of 2% of GDP will be achieved by 2020.
- **Upskilling the human resources.** Malta has taken a structured approach to this problem and a number of strategies and plans of action have been prepared, together with suitably ambitious targets. The establishment of the Skills Council will allow to assess the situation on an ongoing basis and guide policy development.
- **Strengthening entrepreneurship and innovation outputs.** In recent years a broad spectrum of initiatives fostering entrepreneurship have been introduced, addressing areas such as education, incubation and finance. Many of the initiatives underway will take time to achieve the desired effect, and lack of formal evaluation exercises makes it difficult to assess their effectiveness. Nevertheless, there are encouraging signs that these are already yielding positive results.

## MAIN R&I POLICY DEVELOPMENTS IN 2016

- The Business Enhance ERDF Grant Schemes
- The Business START (B.Start) scheme
- The Start-up finance scheme
- The Multilateral Trading Facility launched
- Setting up the National Development Bank

# 1 Main R&I policy developments in 2016

| | |
|---|---|
| **Business Enhance ERDF Grant Schemes** (07/2016-11/2016) | The Business Enhance ERDF Grant Schemes has a total financial allocation of €51m under the following schemes: SME Growth Grant Scheme (7/2016); Start-up Investment Grant Scheme (7/2016);SME Consultancy Services Grant Scheme (8/2016); SME Diversification and Innovation Grant Scheme (10/2016); SME Internationalisation Grant Scheme (10/2016); e-Commerce Grant Scheme (11/2016). |
| **Business START (B.Start)** (07/2016) | This scheme provides seed funding of up to €25,000 for small start-ups in the early stages of development. The total allocation for 2016 is €1m. |
| **Start-up finance scheme** (02/2016) | This scheme provides mezzanine finance to support small start-up undertakings in the setting-up and initial growth phases. The support takes the form of repayable assistance linked to private equity of up to €200,000, which may be increased to €500,000 in certain cases. |
| **Multilateral Trading Facility** (02/2016) | The Malta Stock Exchange formally launched the Multilateral Trading Facility which makes equity finance available to a much broader spectrum of businesses than was previously the case. The new instrument allows a lower equity offering of and no minimum share allocation, and targets SMEs seeking equity finance in the range €1 -5 million. |
| **The National Development Bank** (09/2016) | Work on the National Development Bank is progressing well and in August 2016 the European Commission granted approval for the setting up of this institution. This will fulfill an important lacuna complementing the facilities offered by the commercial banks. |

## 1.1 Focus on National and Regional Smart Specialisation Strategies

Description and timing: Malta's Smart Specialisation Strategy (S3) has a national scope. It was finalised in 2014 and has been incorporated into the National R&I Strategy 2020. The strategy was developed following an extensive open consultation exercise involving all relevant policymakers and stakeholders, including academia and industry representatives. The S3 identified the following seven areas of specialisation:

- tourism product development;
- maritime services;
- aviation and aerospace;
- health, with a focus on healthy living, active ageing and e-health;
- resource-efficient buildings;
- high value-added manufacturing with a focus on process and design, and
- aquaculture.

In addition, ICT was identified both as a horizontal enabler across all identified specialisation areas, as well as a Smart Specialisation niche in itself. R&I opportunities in rural development were also highlighted.

New developments: The following schemes were launched in 2016 (see 4.1 for more details): the SME Growth Grant Scheme; the Start-up Investment Grant Scheme; the

SME Consultancy Services Grant Scheme; the SME Diversification and Innovation Grant Scheme; the SME Internationalisation Grant Scheme and the e-Commerce Grant Scheme.

Outstanding issues: A technical steering group incorporating policymakers and key stakeholder representatives are working on the development of an action plan which will include tailored actions and initiatives for each area of specialisation. The Action Plan has been endorsed by the European Commission (EC) but is still pending the formal approval of the Cabinet before publication. With reference to the Regional Research and Innovation Strategy for Smart Specialisation (RIS3) monitoring mechanism, the national strategy specifies that such a mechanism will be established to review progress and ensure that the strategy is updated as necessary over time. The Maltese authorities expressed their interest in receiving specific support under the PSF for the development of a monitoring system for the Action Plan implementing the National R&I Strategy, including for the RIS3. A report was drafted by independent experts to feed in the current setting up of the monitoring system.

# 2 Economic context

Malta has a strong economy, generally outperforming most EU Member States with a real GDP growth rate of 6.2% in 2015 and is set to remain robust (4.1% in 2016 and 3/7% in 2017 and 2018). This was mainly driven by increases in investment and private consumption arising from increasing disposable income of households. Government debt has been improving and fell to 64% of GDP in 2015. The budget deficit has been reined in, decreasing from 3.6% of GDP in 2012 to 1.4% in 2015. Both indicators are forecast to continue improving in coming years (EC, 2016a). The total factor productivity has stagnated since the beginning of the past decade lagging behind the average for the EU (EC, 2015b), while the nominal labour productivity per person slightly increased to reach 87.8 of the EU average in 2015. It is however still far from its level of 2010 (97.1 of EU average).

## 2.1 Structure of the economy

Malta has few natural resources and a small primary sector, with agriculture contributing less than 2% to Gross Value Added (GVA) in 2015, and the economy is based upon manufacturing and services. The services sector has become increasingly important to the Maltese economy, with its share of GVA increasing from 73% in 2004 to 83% in 2015, thus ranking Malta 3rd among EU countries, with the highest growth rate. The share of manufacturing value added fell from 15% of GVA in 2004 to 9.5% in 2015, but some sub-sectors (i.e., pharmaceuticals), have increased their share. In past years tourism was a key component of the services sector, but this sector has now expanded to include aircraft maintenance, maritime activity, professional services, back-office administration, information technology, online gaming, etc. The contribution of knowledge-intensive services as a share of total value added has increased from 45.0% to 49.3% in 2009-2015 (Central Bank of Malta, 2016). The composition of the manufacturing sector has changed substantially, with high and medium-tech activity becoming increasingly important. The share of employment in knowledge-intensive services has risen from 39.4% in 2009 to 44.5% in 2015 (Central Bank of Malta, 2016).

## 2.2 Business environment

According to the 2016 World Bank report on the ease of doing business, Malta ranked 76$^{th}$ out of the 190 countries surveyed, climbing 7 places from the previous year. Malta has the lowest rank among EU28, ranking worst on the following indicators: 'starting a business' (132$^{nd}$), 'resolving insolvency' (84$^{th}$ place), and 'registering property' (147$^{th}$). It scored best on 'paying taxes' and 'protecting minority investors'. Malta slipped 2 places in the Integration of Digital Technology by businesses, and ranks 13$^{th}$ among EU countries (EC, 2016d).

The Global Competitiveness Report 2016-2017 (WEF 2016) presents a more optimistic picture, ranking Malta 40th out of the 138 countries. The most problematic factors for doing business are inefficient government bureaucracy, access to financing and insufficient capacity to innovate. With reference to insolvency procedures, Malta ranked in 84th place globally (World Bank, 2016). On the matter of access to finance, The Small Business Act (SBA) Factsheet (EC, 2015a) reports that Malta's performance improved compared to the previous year and it now ranks above the EU average. The level of support (i.e. eligibility to benefit from support schemes) for entrepreneurs seeking a second start remains below the EU average (Malta 77%, EU 82%) but steps are in hand to address this issue and a working group was set up in early 2015. It is expected that the necessary legislative changes will be finalised in the coming months (Ministry for Finance, 2016a).

## 2.3 Supply of human resources

Malta has a long-standing problem with high levels of early school leavers – 19.8% in 2015 compared to an EU average of 11%. At the same time the country has one of the highest levels of skilled job mismatches, with 55% of employers reporting difficulty in finding appropriate candidates to fill vacancies (Ministry for Education and Employment, 2014a). The corresponding figure for unskilled jobs is 20%, but still one of the highest in the EU. Malta has only 0.354 new doctoral graduates per thousand of population aged 25-34, compared to the EU average of 1.84, and ranks last on this indicator (EC, 2016b). The number of researchers is still low by EU standards, standing at 3.17 per thousand population in 2013 compared to an EU average of 5.36.

# 3 Main R&I actors

The Parliamentary Secretary for Research, Innovation, Youth and Sport is responsible for research and innovation strategy and policy, delegating this responsibility to the Malta Council for Science and Technology (MCST). The MCST also manages the national R&I funding programme. The Ministry for Economy, Investment and Small Business is responsible for Malta Enterprise which operates a number of schemes promoting R&I in the private sector. The Parliamentary Secretariat for EU Funds within the Ministry for European Affairs houses the managing authority for ESIF. With regards to their role as research funders, there are two additional public bodies to be mentioned: the Ministry for Education and Employment and the Ministry for Sustainable Development, the Environment and Climate Change.

The Malta Aquaculture Research Centre, accounts for most of the research expenditure in the government sector. The University of Malta is the main research performer in the higher education sector. The Malta College of Arts, Science and Technology has become increasingly involved in research projects in recent years.

The Malta Chamber of Commerce, Enterprise and Industry is the main independent organisation representing the business sector in Malta and incorporates an RTDI Committee which actively participates in R&I policy development. Micro- and SMEs accounted for 79% of BERD in 2013.

Multinationals numbered 157 in 2013, with 60% of these being European companies, with the highest number of multinationals present in Malta coming from Germany, Italy, the UK and the Netherlands. These multinationals operate in a number of sectors including manufacturing, ICT, wholesale & retail, professional & scientific, and administration & support services.

While Malta does not have any NGOs with a focus on funding research, there exist a number of independent charitable organisations working in the health arena which provide assistance to patients and their families and occasionally contribute funds towards R&D. In 2011 the University of Malta (UoM) received a donation of €0.5m from the government as seed funding for setting up a Research and Innovation Development

Trust (RIDT). The RIDT has registered some success with existing charitable organisations to secure funding for health research projects.

The level of cooperation activities of innovative companies is rather low, with only 16.4% of innovative companies engaged in any type of cooperation compared to an EU average of 31.3% (CIS, 2012). Of these, only one third cooperate with universities and higher education institutions. This is comparable to Cyprus (4.6%), which has an economy with a similar structure, but still lower than 13% in EU-28 as a whole. Only 2.5% cooperate with government or public or private research institutes (compared to 4.6% in CY and 8.9% in EU-28). With reference to public-private co-publications, Malta came in at 2.35 compared to a EU28 average of 33.88 in 2015 (EC, 2016b).

In the last decade the University has adopted a business orientation, and only in the last 5-6 years that it has started to put in place the necessary framework to promote collaboration with industry (such as the establishment of the Knowledge Transfer Office in 2009, and the Takeoff business incubator and seed fund in 2014).

# 4 R&I trends

The total gross domestic expenditure on R&D (GERD) amounted to €67.6m in 2015 which indicates that the rising trend of GERD continued (since 2009). At the same time GERD intensity has only slightly increased in 2015 0.77% (and even decreased compared to 2012: 0.83%) which can be partly explained with the somehow unexpectedly high GDP growth. The funding from abroad plays an increasingly important role (above 21% of GERD in 2015) and the EU funds equalled to more than half it in 2014 (64%). Malta has set a national R&D target of 2% of GDP to be reached by 2020. Despite the growth in nominal terms, it is fair to say that the target appears somewhat ambitious.

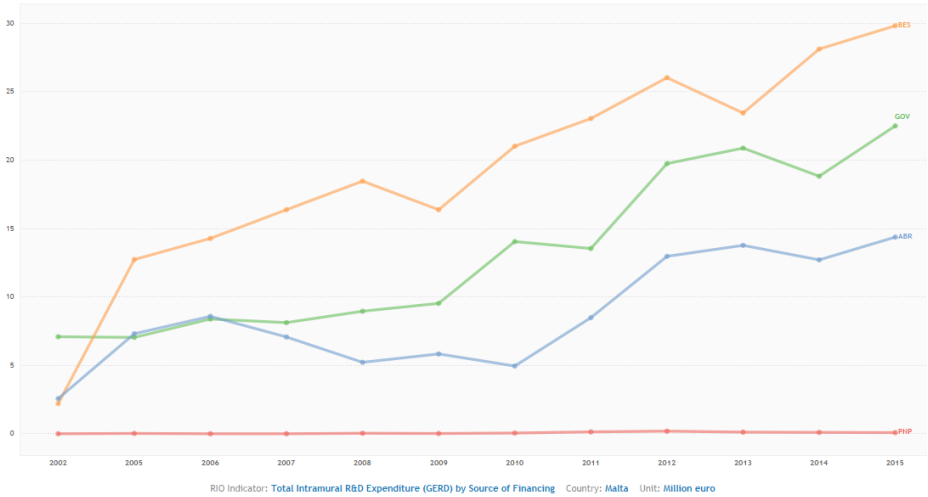


**Figure 1** Trend of GERD by sources of funding
Data source: Eurostat, 2016

The business enterprise sector (BES) is the largest R&D performer, accounting for 49% of GERD in 2015, while the higher education (HES) sector accounted for 34%, with the remaining 18% attributed to Government and public research organisations.

## 4.1 Public allocation of R&D and R&D expenditure

In the post-crisis period, there is an improvement in the "primary" structural budget balance. Meanwhile both GBAORD and government financed GERD increased or at least they were safeguarded but never fell back to their crisis or pre-crisis level. Therefore, the post-crisis fiscal consolidation did not have a negative impact on direct public support to R&D. There appears to be no explicit mention of smart fiscal consolidation in

any policy documents. Nevertheless, the country has followed the principles of smart fiscal consolidation since there have not been any reductions in public funding for research and innovation in recent years except from 2014. On the contrary, recent years have been marked by substantial increases in both national funding as well as funding from EU structural funds. In 2015, government sector performed 17.5% of GERD compared to 10% in 2014.

The Business Enhance ERDF Grant Schemes has a total financial allocation of €51m for industry schemes of which €20m is allocated to RTDI, €26m goes to competitiveness initiatives and €5m for investment in e-Commerce. The following schemes have been launched in 2016:

- the SME Growth Grant Scheme has an allocation of €8m and will finance investment related to growth strategies, with a maximum grant value of €500,000;
- the Start-up Investment Grant Scheme has an allocation of €7 million and will assist micro and small enterprises established for less than three years with a maximum grant value of €300,000;
- The SME Diversification and Innovation Grant Scheme with a financial allocation of €8m will provide grants of up to €200,000 to assist SMEs to bring to market significantly improved and advanced products/services.
- The SME Internationalisation Grant Scheme with a budget of €2m. Grants of up to €10,000 will be made available to SMEs to finance 50% of expenses related to participation in International Business Promotion Fairs.
- The e-Commerce Grant Scheme with a budget of €5m. Grants of up to €5,000 will be made available to SMEs to finance 50% of expenses related to development or enhancement of e-commerce websites and applications.
- The SME Consultancy Services Grant Scheme with a budget of €1m. Grants of up to €4,000 will be made available to SMEs to finance 80% of eligible expenses related to operations reviews, feasibility studies and development of business plans for a broad variety of initiatives.

Around 90 enterprises are expected to benefit from these two schemes. ESIF funding has also been utilised to set up the JAIME (Joint Assistance Instrument for Maltese Enterprises) scheme in collaboration with a local bank. This provides assistance to SMEs to obtain financing at advantageous interest rates and with reduced collateral requirements. It is expected to leverage more than €60 million of new SME financing by the end 2019, targeting around 850 enterprises.

Apart from funding schemes, there have been various other important initiatives aimed at improving access to finance. In 2016 the Malta Stock Exchange formally launched the Multilateral Trading Facility which makes equity finance available to a much broader spectrum of businesses than was previously the case. The new instrument allows a lower equity offering of and no minimum share allocation, and targets SMEs seeking equity finance in the range €1 -5 million (Ministry for Finance, 2016). Work on the National Development Bank is progressing well and in August 2016 the EC granted approval for the setting up of this institution, which will fulfill an important lacuna complementing the facilities offered by the commercial banks (Times of Malta, August 2016). The bank will finance SMEs and large infrastructure projects.

## 4.2 Private R&D expenditure

Although modest compared to EU level, the business enterprise sector expenditure on R&D (BERD) showed strong growth until 2014. In nominal value it was €32.8m in 2015 and has slightly decreased compared to 2014 (€33.5m). When expressed in percentage of GDP, the increase is less noticeable: from 0.33% of GDP in 2009 to 0.37% in 2015. The closure of a key pharmaceutical R&D centre in Malta (Actavis) following acquisition

by another company led to a decrease in BERD in 2013 (Times of Malta, March 2013). The number of R&D personnel (Full Time Equivalent - FTE) grew rapidly over the period 2009-2014 and decreased slightly in 2015. In spite of this, BERD share of GERD has fallen during this timeframe as it was outstripped by growth in the public and higher educational R&D sectors which benefitted from a significant injection of structural funds.

Private companies rely heavily on own funds for their research and receives little funding from other sources. National public funding for private R&D is one of the lowest in the EU, standing at just 0.13% of BERD in 2015.

In terms of sectorial distribution, the services accounted for 69% of the total BERD. The importance of the manufacturing sector is declining with its share decreasing from 70% in 2008 to 30% in 2014. The biggest gains were registered by the Information and Communication sector, which increased from 26% to 43% over the same period. It is estimated that approximately 86% of private sector research was undertaken by high-tech firms.

Within the services sector computer programming had the largest share of the expenditure in 2014 followed by software publishing. In manufacturing, the pharmaceuticals sector was well ahead but lost its fast growing pace and is followed by the growing sector of manufacturing of electronic components.

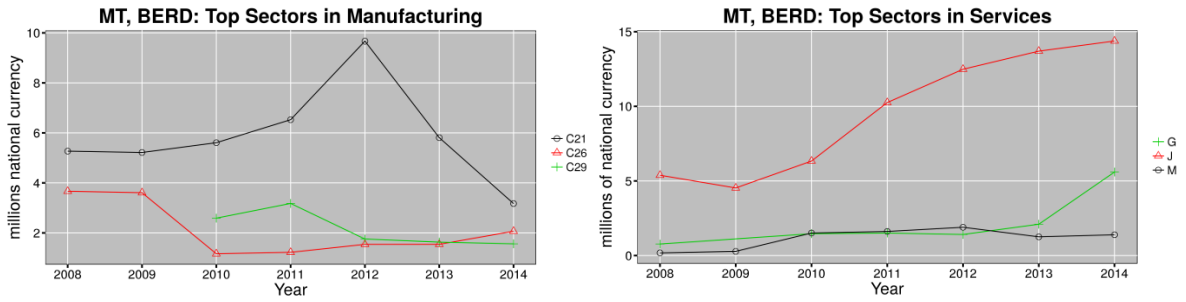


**Figure 2** Top sectors in Manufacturing (C21=Manufacture of basic pharmaceutical products and pharmaceutical preparations, C26= computer, electronic and optical products, C29= Manufacture of motor vehicles, trailers and semi-trailers). Top service sectors (J=information and communication, G=wholesale and retail trade; repair of motor vehicles and motorcycles, M=professional, scientific and technical activities). Data source: Eurostat, 2016

## 4.3 Public sector innovation and civil society engagement

Malta was an early adopter the e-government paradigm and for the past twenty years government has channelled substantial investment into ICT (Parliamentary Secretariat for Competitiveness and Economic Growth, March 2014).

The Public Service Innovation Scoreboard reports that Malta has achieved a high level of delivery and sophistication of eGovernment services. In 2013 the Public Sector Innovation Scoreboard ranked Malta first in terms of 'Increased efficiency of government services due to the use of ICT', 'Online availability of public services' and Improvements in public services for businesses' (EC, 2013). The UN eGovernment Index is less complimentary, ranking Malta 13th within the EU in terms of online service (UN, 2016). In spite of widespread availability of online services, however, utilisation of online facilities by the public is low with only 28% of internet users fully engaging with public authorities online, with Malta ranking 18th within the EU on this score.

In June 2015 the University of Malta in collaboration with the Malta Business Bureau set up the first crowdfunding platform in Malta, whose operation will be partially supported with government help in the early stages (http://www.zaar.com.mt). Use of this platform in the first few months of its existence has been largely restricted to cultural and philanthropic initiatives. The platform has been hampered by the lack of an appropriate legislative framework, and steps are being taken by the platform management in collaboration with the relevant authorities to address this issue.

The Malta Association of Family Enterprises (MAFE) was set up in 2011 to offer education and training to family businesses in Malta. MAFE also provides a voice for the family-business sector and works with stakeholders at a national and international level. It was actively involved with the government in the development of the Family Business Act, which aims to establish a legislative framework for family-owned businesses to facilitate their continued existence over successive generations (Ministry for Finance, 2014).

The Government has also been developing legislation titled the Social Enterprise Act, the aim of which is to assist the disadvantaged and workers with disability in seeking employment and being reintegrated into the working community. It also aims to provide enterprises with a platform to operate on a not-for-profit basis to benefit the community. The legislation is being developed in line with EU principles and models as practised and established in other EU member states. A completed draft Bill was presented to Cabinet for its endorsement, after which the proposed Bill was published as a white paper for public consultation.

# 5 Innovation challenges

## 5.1 Challenge 1 Improving the quality of the science base

### Description

The quality of the science base in Malta is a continuing concern in terms of scientific excellence, infrastructure and human resources in scientific research. The Research Excellence Composite Indicator ranks Malta 23rd in EU28, markedly behind the leading EU Members States although compared to similar size economies and neighbouring countries, Malta is coping better. The overall score of Malta has increased in recent years, but starting from a very low base (17.73 in 2007 to 23.27 in 2012).

With reference to scientific excellence, among the different components of the indicator, the highly cited publication and Patent Cooperation Treaty (PCT) patents decreased in 2012 compared to 2007, the top universities and PROs score remained the same and only the sum of European Research Council (ERC) grants increased. In terms of share of publications among the top 10% most highly cited Malta's performance fluctuated across years and the country's performance decreased compared to the last year (EC, 2016b).

The level of R&D expenditure in the higher education sector in 2015 (0.26% of GDP) was low compared to the EU28 (0.47%). The funding allocated to government research bodies almost doubled to reach 0.13% of GDP but is still considerably less than the EU28 (0.24%). Malta does not have any funding programmes targeted exclusively at academic research. In addition, the European Innovation Scoreboard shows that Malta has only 0.354 new doctoral graduates per thousand of population aged 25-34, compared to the EU average of 1.84, and ranks last on this indicator (EC 2016b). In absolute terms the number of researchers is small, with only 817 FTE in 2015, which accounted for 0.42% of the total active population, compared to 0.76% in the EU.

### Policy Response

The government, through the National R&I Strategy 2020, acknowledges the need to further strengthen the "knowledge base" and centres its efforts around three areas: investing in human capital; research infrastructures and capacity building for excellence in climate change adaptation.

Malta has set targets to be achieved by 2020 for both number of researchers and doctorate holders. A number of measures are in place to encourage more individuals to pursue studies in science and technology such as the setting up of the Interactive Science Centre. In order to increase the number of individuals with a doctoral qualification in the research sector, Malta has launched the Endeavour scholarship Scheme and Reach High Post-doctoral Grant Scheme (May 2015).

Malta has implemented several investment projects related to research infrastructures, mainly research laboratories at the University of Malta (e.g. molecular biobank, material testing and prototyping, physics research laboratory). Other infrastructure initiatives, although not targeted primarily at the science base, would be expected to have a positive impact in this area. These include the Malta Life Sciences Park and Digital Hub infrastructures which support the health (pharmaceuticals) and ICT-themed R&D. The ERDF allocations (ERDF for R&D amounts to 80% of the total funding for R&D) in the Operational Programme 2014-2020 include significant funding for new infrastructure initiatives (EC, 2014).

### Policy Assessment

The different scholarship schemes worked well in attracting more doctoral graduates, but although the relevant indicator in the European Innovation Scoreboard has improved since 2012, Malta still ranks last on this score. The new post-doctoral grant scheme fills an important void in the funding system, although there is a danger that much of the funding will find its way overseas rather than being used locally since this is within the regulations and local researchers value the prestige of undertaking research at an overseas institution. The targets set in the HR area are very likely to be achieved even before 2020, although it must be remarked that these targets are much less ambitious than the target for GERD.

The continuation of existing support measures is very important for the continued development of researcher talent. Significant progress has also been made with regards to the improvement of the research infrastructures. Newly built facilities are in line with the priorities identified in the National R&I Strategy and the S3. Once again significant ESIF funds have been allocated for RIs in the current programming period (2014-2020). Although the rolling R&I Action Plan containing concrete measures has not yet been officially adopted, preliminary indications point to a possible match between developing excellence and S3 identified areas in health, aquaculture, aerospace and resource efficient buildings.

In spite of these positive developments, however, funding for public and academic research activity remains very low. Increasing such funding would provide research opportunities for the growing researcher pool, stimulating further the researchers and enabling the exploitation of the significant investments made in research infrastructures in recent years.

## 5.2 Challenge 2 Increasing the R&I investment

### Description

In 2015 Malta's GERD was 0.77% of GDP compared to 2.04% in the EU28, with Malta ranking among the four least performing countries on this indicator. GERD increased sharply over the period 2009 – 2012, with increases in national funding and use of structural funds for research infrastructure being the key drivers behind the positive performance. However, in 2013-2014 GERD has almost stagnated and even fell marginally as a percentage of GDP.

Most of the R&D is performed by the business sector (0.37% GDP compared to 1.3% GDP in the EU28), while the higher education sector is smaller but compares better in relation to the EU (0.26% GDP compared to 0.47% GDP in the EU28). R&D expenditure by government and public research organisations was 0.13% of GDP in 2015 (EU28: 0.25% GDP), one of the lowest in the EU. Even so, about 75% of this is attributed to one-off expenditure related to the Life Sciences Centre and Digital Hub funded through structural funds. National funding for private R&D is one of the lowest in the EU, standing at just 0.01% of GDP compared to an EU average of 0.09% in 2012.

Further to that, the European Council recommended that Malta takes action in 2015-2016 to improve small and micro-enterprises' access to finance, in particular through

non-bank instruments (CEU, 2016). Venture capital investment performance has declined by 19% (EC, 2016b).

### Policy Response

The National R&I Strategy 2020 sets a target of R&D expenditure at 2% of GDP by 2020. The Smart Specialisation Strategy identifies areas in which innovation actors should focus their efforts, but no details on targets or financial commitment are clear yet. These are to be described in depth in the Action Plan, yet to be officially adopted.

In recent years numerous funding schemes and tax incentives have been launched with the objective of encouraging private sector R&D (Fusion Technology Development Programme, R&D Grant Scheme, Innovation Actions Grant Scheme, R&D Feasibility Studies, etc.). Other measures include the Takeoff Seed Fund and the ICT Innovation Hub, with ambitious plans to increase the funding for the latter sevenfold from the current value of €30k p.a. to €200k (Ministry for Finance, 2016a). Venture Capital Malta was launched in February 2015 as a public private partnership with the aim of attracting venture capitalists to Malta.

The ERDF operational programme 2014-2020 specifies an allocation of €72.2 (including national contribution) for R&I, of which approximately 64% is earmarked for public infrastructure, 22% for private enterprise equipment, and 10% for private enterprise R&I activity.

### Policy Assessment

The public R&D funding system has improved considerably in recent years, both in terms of funding levels as well as in the variety of policy instruments seeking to encourage R&D activity. Policies for increasing R&I include a number of positive points (the Reach High post-doctoral grant scheme, the planned increase in funding for the ICT Innovation Hub and accelerator).

However, the level of public funding for private R&D remains very low. Allocation of government funding for the key Fusion programme (the main research funding programme) has stagnated and is not even increasing in line with GDP. Clearly, this can only have a very limited impact in terms of promoting R&D in the business enterprise sector. On the other hand, Malta performs above the EU average in non-R&D innovation expenditure (EC, 2016b) which is also important for the national innovation system. Approximately 91% of this relates to acquisition of machinery and equipment.

The R&I funding system is dependent on EU structural funds, leading to disruption in the availability of funding at the changeover from one programming period to the next. Annual allocation of ESIF funding in the new programming period is approximately equal to that of the last years of the previous programme. Allocation of ESIF funding to R&I for the 2014-2020 period is only 9% compared to an EU average of 12%. No plans are in hand to address one of the major shortcomings of the Maltese R&I landscape, namely the very low level of government R&D funding. All in all, there is no convincing account of how the target GERD of 2% of GDP will be achieved.

## 5.3 Challenge 3 Upskilling the human resources

### Description

According to the Country Report Malta 2015 "the supply of skills has not yet adjusted to the labour-market requirements" and it is difficult for employers to recruit experienced workers in highly skilled sectors where demand exceeded the supply (EC, 2015b). The issue is concerning a broad skills spectrum and has already been reflected in Malta's Employment Strategy which reports that 55% of employers experienced difficulty in filling vacancies for skilled positions, one of the highest in Europe (Ministry for Education and Employment, 2014a). In addition, there is no "clear framework for monitoring and skills anticipation" (EC, 2015b). The skills mismatch is reconfirmed in the Country

Specific Recommendation (CSR) 2016 (CEU, 2016) and 2016 Country Report (EC, 2016c), the latter stating that the "unemployment rate dropped to 5.1 % at the end of 2015, but low labour market participation and skills supply remain important issues."

This state of affairs is brought about by a number of factors, including the low levels of employment which in 2015 accounted to 71.3% of the total population, 27th in EU-28 (EC, 2016f). The percentage of early school leavers is the second highest in the EU and participation in lifelong learning was 7.2% in 2015, well below the EU average of 10.7. On the other hand, the number of STEM graduates per 1000 population was 2.2 in 2014, only slightly below the EU average of 2.3, but Malta ranks really low in new doctoral graduates (see challenge 1). Although this could be considered not an immediate threat, the current situation suggests that it might still evolve in a future challenge for supply of skilful workers for the R&I system.

## Policy Response

A number of strategies and action plans have been developed including the Strategic Plan for the Prevention of Early School Leaving (Ministry for Education and Employment, 2014b) and the National Lifelong Learning Strategy (Ministry for Education and Employment, 2014c). These establish a number of targets and seek to address the problem through a broad variety of measures including investment in education, strengthening vocational training and strongly promoting education at all levels including lifelong learning.

Measures to address the high levels of early school leavers have been underway for a number of years, with a target of 10% by 2020 compared to an actual value of 20% in 2015. There are already policies in place and others are in the process of implementation.

The Government, having consulted the social partners is in the process of creating a single national apprenticeship scheme. The scheme will cover a larger number of qualification levels and occupations and also includes a system of tax deductions introduced by the 2014 budget. More vocational courses are being introduced, covering additional subjects, and the number of apprenticeships has gone up in order to meet the high demand. The target for 2020 is 45% of students in vocational education from the 2012 value of 39% (Ministry for Education and Employment, 2014b)

Moreover, the National Commission for Further and Higher Education has introduced a national system for validation of informal and non-formal learning in a few sectors, aligning with the Malta Qualifications Framework. However, NCFHE intends to keep widening the number of sectors in which the possibility for validation is available nationally (NCFHE, 2016). A National Interactive Science Centre is being developed with the aim of encouraging more students to opt for science subjects at secondary school level. Scholarship schemes were introduced to foster PhD studies (see also challenge 1).

Malta also plans to set up a Skills Council to better align educational outcomes with labour market relevance while a 'virtual labour market' is meant to facilitate the matching of skills with work placements (Ministry for Finance, 2014).

## Policy Assessment

Malta proactively searches for solutions to this challenge. Various strategies and plans of action have been prepared and suitably ambitious targets have been set.

Actions taken to reduce the number of early school leavers are having the desired result, and the number of early school leavers fell from 33% in 2005 to 20% in 2015, but continued efforts are necessary in this area in order to reach the target of 10% by 2020. The measures taken to address the vocational education system contributed significantly to this result.

Progress in lifelong learning has been slow, increasing from 6.2% (of the population aged 25 to 64) in 2010 to 7.2% in 2015. The objective is to raise this figure to 15% by

2020. The relevant action plan includes a comprehensive range of initiatives and progress is to be expected. The establishment of the Skills Council will help assessing the situation on an ongoing basis and guide policy development.

## 5.4 Challenge 4 Strengthening entrepreneurship and innovation outputs

### Description

Capitalising on the investment in R&I through the development of marketable products and services presents another challenge for Malta. SMEs in particular could well be lacking the necessary skills (challenge 3), or the finance (challenge 2) to buy in the required expertise.

Although having improved, Malta has the lowest rank in the EU in the ease of doing business index (76$^{th}$ out of the 190 countries) of any EU member state (World Bank, 2016). The Global Competitiveness Report 2016-2017 (WEF, 2016) presents a more optimistic picture, ranking Malta 40$^{th}$ out of the 138 countries. It reports that the most problematic factors for doing business are inefficient government bureaucracy, access to financing and low business dynamics. On the other hand, the World Bank also reported that Malta ranked in 2$^{nd}$ place in terms of new business density which measures the number of newly registered corporations per 1000 working-age population.

Although the overall innovation performance of Malta has strengthened (based on European Innovation Scoreboard 2016), a number of indicators show that national innovation system could further improve. Malta's patent performance is far below the EU average with only 0.622 PCT patent applications per billion GDP in current PPS against 3.525 in EU28. The share of knowledge-intensive services export (in total export of services) is 25.9% against 63.1% on average for the EU28 (EC, 2016b). In addition, declining performance is observed in sales share of new product innovations (-11%).

### Policy Response

The National R&I Strategy 2020 addresses this structural weakness and highlights the need to create a comprehensive R&I support ecosystem (MCST, 2014). It aims to achieve this by tackling three areas: increasing the effectiveness of the delivery system, strengthening the capacity of entrepreneurial actors to innovate, and ensuring a seamless chain of support. The Smart Specialisation Strategy identifies areas in which innovation actors should focus their efforts, but no details on targets or financial commitment are clear yet. These are to be described in depth in the Action Plan, yet to be officially adopted.

Novel initiatives implemented or underway in 2015 and 2016 include the Business Start scheme, SME Growth Grant Scheme; Start-up Investment Grant Scheme; SME Diversification and Innovation Grant Scheme; SME Internationalisation Grant Scheme; e-Commerce Grant Scheme; SME Consultancy Services Grant Scheme, Venture Capital Malta (challenge 2), a crowdfunding platform and a Multilateral Trading Facility.

Various initiatives are underway to develop an entrepreneurship culture at all levels of education. The Framework for Education Strategy for Malta 2014-2024 embraces entrepreneurship training and the new curriculum includes entrepreneurship as one of its components (Ministry for Education and Employment, 2014d). The Malta College of Arts, Science and Technology in recent years introduced entrepreneurship as a core subject to students. The Centre for Entrepreneurship and Business Incubation (CEBI) was officially set up at the University to teach entrepreneurship to students across Faculties and to educate and support graduates in the creation of successful Knowledge-Based business ventures.

Other initiatives include the TAKEOFF Business Incubator, as well as the MCAST Entrepreneurship Centre and the ICT Innovation Hub. The Life Sciences Park aims to encourage local start-ups as well as attracting FDI in the biomedical field.

### Policy Assessment

Recent years have seen the introduction of a broad spectrum of initiatives fostering entrepreneurship and targeting education, incubation and finance. Official figures prove that Malta clearly showed an improvement in terms of innovation outputs. The initiatives will take time to have an effect, and their effectiveness is not easy to assess rigorously due to the lack of systematic evaluation studies. First steps towards better monitoring of the R&I area have been taken since The Maltese authorities expressed their interest in receiving specific support under the PSF for the development of a monitoring system for the Action Plan implementing the National R&I Strategy (EC, 2016e).

There are encouraging signs that the initiatives to tackle this challenge are already yielding positive results. This is clearly reflected in Malta's improved performance in a number of European Innovation Scoreboard (EC, 2016b) indicators (e.g. SMEs innovating in-house, SMEs introducing innovations, etc). The challenge would be to keep up with the same pace.

## 6 Focus on creating and stimulating markets

*This section aims at describing and assessing national level efforts to introduce demand-side innovation policies to stimulate the uptake of innovation or act on their diffusion, including public procurement and regulations supporting innovation. It also analyses policy measures aimed at internationalisation of companies with the aim of increasing the innovativeness of the economy.*

Green Public Procurement was formalised in 2011 through the publication of the first GPP National Action Plan. This established GPP targets for 18 product and service groups and proposed a series of measures for their attainment.

With reference to Public Procurement for Innovation, little progress has been made although a couple of examples of such calls were mentioned in the ERA-PRISM project (Policies for Research and Innovation in Small Member States to Advance the European Research Area, project report not publicly available):

- Active Data Centre – set of business requirements were stipulated to increase the potential innovativeness of this project and as result the product performed as well as expected and was more efficient than the one it replaced. The procurement procedure was conducted on behalf of Malta Information Technology Agency (MITA).
- Hospital Catering – the procurement was conducted on behalf of the Foundation for Medical Services. This is the first time a competitive dialogue procedure was used and the solution procured is considered to be high quality and cost-efficient.

One area where legislation has had an impact on innovation and business growth is in the online gaming sector. Malta was the first EU state to fully regulate online gaming in 2000, established a dedicated regulatory authority for this emerging industry and released the Remote Gaming Regulations in 2004. Today Malta hosts many of the world's largest gaming companies and is considered Europe's iGaming capital (Country Profiles, 2016).

The Pre-Budget Document published in August 2016 (Ministry for Finance, 2016b) states that green public procurement (GPP) instruments contribute towards a more resource efficient economy. During 2015, the Green Public Procurement Office within the Ministry for Sustainable Development, the Environment and Climate Change (MSDEC) continued its mainstreaming mainly through substantive training sessions across all Government sectors. This led to a more sustainable public expenditure model through the inclusion of the national GPP criteria. Additionally, during the course of 2016 actions on GPP l

continued with an emphasis on the development of the second National Action plan to further integrate resource efficiency and sustainable production and consumption principles into public expenditure (Ministry for Finance, 2016).

The National Strategy for R&I 2020 (MCST, 2014) refers to demand-driven innovation and considers it to be a major driver for the economy and innovation. However, it stops short of making any specific recommendation or setting any targets or timeframes in relation to PPI.

In the fast-moving online gaming sector, Malta continues to update legislation to remain en courant with new developments and is currently working on the development of a new Gaming Act which will create a coherent governance and regulatory framework for all forms of gaming based on a set of common principles (Gaming Malta, 2016).

With reference to Green Public Procurement, some progress has been made and initiatives are underway to promote further uptake. However, it is perceived more as a tool for sustainable development rather than as a driver of innovation.

In terms of public procurement for innovation, the approach seems rather underexploited since in Malta there appears to be a limited number of demand driven policy initiatives and lack of any targets, reporting or evaluation are serious impediments to progress in this area.

In the area of online gaming, Malta has done very well by taking an early lead and maintaining an updated legislative and regulatory framework. On the other hand, Malta has failed to take advantages of opportunities for becoming a technology testbed where its small size works to its advantage, fox example becoming a test-bed for driverless cars.

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## List of abbreviations and definitions

| | |
|---|---|
| BERD | Business Enterprise R&D |
| BES | Business Enterprise Sector |
| HES | Higher Education Sector |
| CEBI | Centre for Entrepreneurship and Business Incubation |
| ERDF | European Regional Development Fund |
| ESIF | European Structural and Investment Funds |
| GBAORD | Government Budget Appropriations or Outlays on R&D |
| GDP | Gross Domestic Product |
| GERD | Gross domestic expenditure on R&D |
| GPP | Green Public Procurement |
| GVA | Gross Value Added |
| HEI | Higher Education Institution |
| MCAST | Malta College of Arts, Science and Technology |
| MITA | Malta Information Technology Agency |
| MSDEC | Ministry for Sustainable Development, the Environment and Climate Change |
| MCST | Malta Council for Science and Technology |
| PCT | Patent Cooperation Treaty |
| PPI | Public Procurement for Innovation |
| PRO | Public Research Organisation |
| R&D | Research and development |
| R&I | Research and innovation |
| RIDT | Research & Innovation Development Trust |
| RIS3 | Regional Research and Innovation Strategy for Smart Specialisation |
| SME | Small and Medium sized Enterprise |

## Factsheet

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|---|---|
| GDP per capita (euro per capita) | 14900 | 15900 | 16500 | 17200 | 18100 | 18900 | 20400 | |
| Value added of services as share of the total value added (% of total) | 78.04 | 78.24 | 79.06 | 81.11 | 81.71 | 83.1 | 83.52 | |
| Value added of manufacturing as share of the total value added (%) | 12.85 | 12.95 | 13.21 | 12.61 | 10.84 | 9.92 | 8.96 | |
| Employment in manufacturing as share of total employment (%) | 13.66 | 13.53 | 13.31 | 12.63 | 12.33 | 11.9 | 11.45 | |
| Employment in services as share of total employment (%) | 74.66 | 75.38 | 75.77 | 76.86 | 77.67 | 78.91 | 80.04 | |
| Share of Foreign controlled enterprises in the total nb of enterprises (%) | 0.29 | 0.3 | 0.6 | 0.6 | 0.62 | | | |
| Labour productivity (Index, 2010=100) | 95.6 | 100 | 101.3 | 102.7 | 104.5 | 109.2 | 113.7 | |
| New doctorate graduates (ISCED 6) per 1000 population aged 25-34 | 0.17 | 0.07 | 0.12 | 0.08 | 0.2 | 0.21 | 0.17 | |
| Summary Innovation Index (rank) | 25 | 26 | 26 | 26 | 25 | 25 | 20 | |
| Innovative enterprises as a share of total number of enterprises (CIS data) (%) | | | | 51.1 | | 41.2 | | |
| Innovation output indicator (Rank, Intra-EU Comparison) | | | 21 | 21 | 21 | 17 | | |
| Turnover from innovation as % of total turnover (Eurostat) | | 7.4 | | 10.2 | | | | |
| Country position in Doing Business (Ease of doing business index WB)(1=most business-friendly regulations) | | | | | | 76 | 80 | 76 |
| Ease of getting credit (WB GII) (Rank) | | | | | | 133 | 124 | |
| EC Digital Economy & Society Index (DESI) (Rank) | | | | | | 11 | 12 | 11 |
| E-Government Development Index Rank | | 30 | | | | 40 | | 30 |
| Online availability of public services – Percentage of individuals having interactions with public authorities via Internet (last 12 months) | 34 | 37 | 37 | 41 | 32 | 40 | 42 | 44 |
| GERD (as % of GDP) | 0.52 | 0.62 | 0.67 | 0.83 | 0.77 | 0.75 | 0.77 | |
| GBAORD (as % of GDP) | 0.15 | 0.22 | 0.21 | 0.28 | 0.28 | 0.24 | 0.28 | |
| R&D funded by GOV (% of GDP) | 0.16 | 0.21 | 0.2 | 0.27 | 0.27 | 0.23 | 0.26 | |
| BERD (% of GDP) | 0.33 | 0.37 | 0.44 | 0.47 | 0.4 | 0.41 | 0.37 | |
| Research excellence composite indicator (Rank) | | | | 23 | | | | |
| Percentage of scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country | | 5.05 | 8.62 | 4.98 | 7.37 | | | |
| Public-private co-publications per million population | 4.87 | 7.25 | 4.82 | 4.79 | 4.75 | 2.35 | | |
| World Share of PCT applications | 0.01 | 0 | 0 | 0 | 0 | 0 | | |

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