

# ERAWATCH Country Report 2009

Analysis of policy mixes to foster R&D investment  
and to contribute to the ERA

## Malta

Lisa Pace



EUR 23976 EN/11 - 2009

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JRC 53711  
EUR 23976 EN/11  
ISBN 978-92-79-13317-6  
ISSN 1018-5593  
DOI 10.2791/ 19905

Luxembourg: Office for Official Publications of the European Communities

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# ERAWATCH COUNTRY REPORT 2009: Malta

Analysis of policy mixes to foster R&D  
investment and to contribute to the ERA

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ERAWATCH Network – Independent Expert

Lisa Pace

***Acknowledgements and further information:***

This analytical country report is one of 33 reports for EU Member and Associated States prepared as part of ERAWATCH. ERAWATCH is a joint initiative of the European Commission's Directorates General for Research and Joint Research Centre. For further information on ERAWATCH see <http://cordis.europa.eu/erawatch>. The analytical framework and the structure have been developed by the Institute for Prospective Technological Studies of the European Commission's Joint Research Centre (JRC-IPTS) in collaboration with DG-RTD and the ERAWATCH Network.

The report has been produced by the ERAWATCH Network (<http://www.erawatch-network.eu/>) in the framework of the specific contract on ERAWATCH Policy Mix Country Reports 2009 commissioned by JRC-IPTS. It makes use of information provided in the ERAWATCH Research Inventory with support of the ERAWATCH Network.

In particular, it has benefited from comments and suggestions of Patries Boekholt, who reviewed the draft report. The contributions and comments of Cabrera Marcelino from JRC-IPTS and DG-RTD are also gratefully acknowledged.

The report is only published in electronic format and available on the ERAWATCH website: <http://cordis.europa.eu/erawatch>. Comments on this report are welcome and should be addressed to Mariana Chioncel ([Mariana.Chioncel@ec.europa.eu](mailto:Mariana.Chioncel@ec.europa.eu)).

## Executive Summary

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As highlighted by the Lisbon Strategy, knowledge accumulated through investment in R&D, innovation and education is a key driver of long-term growth. Research-related policies aimed at increasing investment in knowledge and strengthening the innovation capacity of the EU economy are thus at the heart of the Lisbon Strategy. This is reflected in guideline No. 7 of the Integrated Guidelines for Growth and Jobs. This advocates increasing and improving investment in research and development (R&D), with a particular focus on the private sector. This report aims at supporting the mutual learning process and the monitoring of Member States efforts. Its main objective is to characterise and assess the evolution of the national policy mixes in the perspective of the Lisbon goals, with a particular focus on the national R&D investments targets and on the realisation and better governance of the European Research Area. The report builds on the analytical country reports 2008 and on a synthesis of information from the ERAWATCH Research Inventory and other important available information sources.

Malta's total expenditure on research and development (R&D) stood at 0.60% of Gross Domestic Product (GDP)<sup>1</sup>, equivalent to circa €32.68m, which is well below the estimated 1.83% of the EU27<sup>2</sup>.

Public expenditure on research and development reached 0.21% of GDP equivalent to approximately €11.3m in 2007 ([National Statistics Office](#), NSO 2008<sup>3</sup>). This figure represents mainly research undertaken by the [University of Malta](#). Government R&D Expenditure (GERD) stood at 0.02% GDP; business expenditure on R&D (BERD) increased from 0.08% in 2004 to 0.39%<sup>4</sup> in 2007

The progress in achieving national R&D investment targets can be considered positive in terms of the policy response, with a wider mix of demand-side and supply-side policies and measures being implemented that draw from the recommendations of the [National Strategic R&I Plan](#). The measures include the dedication of a substantial portion of structural funds for research infrastructures, the introduction of new scholarship schemes, funding for collaborative research through the platforms of strategic importance (e.g. in manufacturing) and an initiative to draw out an action plan for R&I public procurement. The key issue is that of dovetailing policies and strategies in order to move from implementing individual measures towards addressing system-level needs.

Macro-level policies aim to increase attractiveness of the business environment; this will also serve to spur business R&D. Thus, Malta is embracing the European Commission's proposal for the setting up of a [Small Business Act](#)<sup>5</sup> in order to reduce administrative burdens for business operations by 15% in 2012<sup>6</sup>.

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<sup>1</sup> This is a provisional value provided by Eurostat

<sup>2</sup> This is an estimate for EU-27 countries, Eurostat

<sup>3</sup> National Statistics Office (NSO) 2008 'Expenditure on R&D in the general government sector: 2005-2007', Press Release 20 June 2008

<sup>4</sup> This is a provisional value for 2007, Eurostat

<sup>5</sup> Prime Minister's Budget Speech 2009

<sup>6</sup> COMM (2008): 'Implementation of the Lisbon Strategy Structural Reforms in the context of the European Economic Recovery Plan: Annual country assessments – a detailed overview of progress made with the implementation of the Lisbon Strategy reforms in Member States in 2008' 28<sup>th</sup> January 2009

With regard to boosting business sector R&D, the policy mix has seen an evolution in the type of instruments, target groups and sectors though structural barriers and policy gaps persist and restrain R&I growth in this sector. The new schemes for enterprise consist of dedicated instruments to promote research and industrial development, innovation among low-performing SMEs and opportunities for collaborative projects (through the [Eureka](#) and [Eurostars](#) participation). Another gap remains the lack of a venture capital (VC) fund; despite a number of attempts to introduce venture capital, this never took off.

Slower momentum is recorded in terms of reaching investment targets. Investments are skewed towards route 6 (increasing R&D in the public sector); whilst route 5 (public-private collaborative R&D) is under-represented. Aid schemes for enterprise mainly address routes 1 and 2 of the policy mix. The system still lacks multiannual programmes.

Another barrier lies in the bureaucratic delays arising when accessing and deploying national and EU funds implementing schemes. For example, the grant scheme for industrial R&D has suffered such delays and will only be launched by [Malta Enterprise](#) in 2009.

Barriers to R&D investment	Opportunities and Risks generated by the policy mix
Human resources in R&I	<ul style="list-style-type: none"> <li>• The higher education reform is looking to identify future skills requirements to satisfy the labour market needs, particularly in the areas identified in the government's Vision 2015; these are tourism, financial services, communication and information technology, education, health, manufacturing, value added services and jobs associated with promoting Malta's sister island Gozo as an ecological island. The challenge is to balance the need for new specialisations with the provision of generic skills.</li> </ul>
Availability of R&I Infrastructures	<ul style="list-style-type: none"> <li>• Significant investments in infrastructures, through, for example, new and upgraded facilities at the university (in ICT, engineering, biotech) and improved business incubation facilities, will serve to increase absorptive capacity for R&amp;D whilst also improving Malta's potential to participate in EU-level collaborative projects attracting more research to Malta.</li> <li>• A significant portion of investments is tied to structural funds over the period 2007-2013.</li> </ul>
Limited culture for entrepreneurship and innovation	<ul style="list-style-type: none"> <li>• The policy mix has evolved to encompass instruments that provide direct access to finance for research and innovation with a focus on SMEs that exhibit limited innovative activity.</li> </ul>
A stringent business environment	<ul style="list-style-type: none"> <li>• Reducing administrative burdens for business operations by 15% in 2012 through simplification processes.</li> <li>• Consultations on the adoption of the Small Business Act.</li> </ul>
Implementation of R&I policies and measures	<ul style="list-style-type: none"> <li>• A risk lies in achieving the Lisbon target time delays with implementing policies and measures.</li> </ul>
Effecting the transition from a low-tech to a high-tech industry	<ul style="list-style-type: none"> <li>• Research and innovation investments are focussing on sectors of economic importance so as to build research strength in niche areas.</li> <li>• Enterprise Aid Schemes address that segment of business enterprise that exhibits low innovative activity</li> </ul>

The [European Research Area](#) (ERA) concept is broadly embedded in the National Strategic R&I Plan and [National Strategic Reference Framework 2007-2013](#) that acknowledge the importance of linking the national research framework with the wider European and international research grid. The National Reform Programme (NRP) 2008-2010 has a more explicit ERA dimension, unlike the first, with measures specifically geared to contribute towards opening up to the ERA through the participation in joint programme activities, enhanced researcher mobility and strengthening research infrastructures.

Nonetheless, there are structural and practical barriers limiting engagement with the ERA concept. Although the national R&I system has undergone rapid process of change in recent years, it is still in a maturation phase where the focus is on building capacity, in terms of infrastructures and human resources, in strategic areas in order to be better placed to participate in European research initiatives. The elements of the ERA that are of particular concern include the mobility of researchers, where Malta is already facing a brain drain and researchers are limited in number. [Article 169](#) on participation in joint R&D programming initiatives requires the deployment of resources for R&I and this process only started recently when resources were dedicated for R&I in the national R&I funding programme and more recently in the second structural funds programming period 2007-2013 through a dedicated [Knowledge & Innovation](#) axis.

Initiatives geared at ‘opening up’ the system include legislation for inward researcher mobility, external peer review of the national funding programme and the development of the [EuroMediti](#) initiative as a means for generating sufficient critical mass for R&I and North-South technology transfer, by addressing a Euro-Med market.

There is a feeling that ERA-related policies are not sufficiently differentiated to address the capacities, potential and needs of those Member States (MS), like Malta that are still in a catching up phase and that are faced with a particular set of challenges when trying to come at par with old MS.

	<b>Short assessment of its importance in the ERA policy mix</b>	<b>Key characteristics of policies</b>
Labour market for researchers	<ul style="list-style-type: none"> <li>This has been a priority in the national policy mix in recent years. Efforts have been targeted at boosting the number of early stage career researcher with PhDs and promoting mobility.</li> </ul>	<ul style="list-style-type: none"> <li>Boosting PhDs through scholarship schemes;</li> <li>Legislation for inward third country researcher mobility;</li> <li>New fellowship scheme for two-way mobility of post-doctoral researchers;</li> <li>The new collective agreement for academic staff at the university aims to make researcher careers more attractive.</li> </ul>
Governance of research infrastructures	<ul style="list-style-type: none"> <li>There is no specific commitment at policy level in terms of funding and providing adequate structures to participate in European infrastructural projects.</li> </ul>	<ul style="list-style-type: none"> <li>The current effort is to strengthen infrastructures, mainly in higher education institutions, in strategic areas (NRP Measure 3.0).</li> </ul>
Autonomy of research institutions	<ul style="list-style-type: none"> <li>The emphasis has been on the university reform, specifically to make a tangible transition from a teaching to a research university; though additional efforts are required to ensure more financial autonomy and flexibility.</li> </ul>	<ul style="list-style-type: none"> <li>The recent reform is introducing a quality assurance framework for promotion of academic staff that is being benchmarked against research and teaching outputs.</li> </ul>
Opening up of national research programmes	<ul style="list-style-type: none"> <li>This has been prioritized in the NRP 2008-2010, where Malta is expected to participate in a joint programme by 2010. However the national R&amp;I Funding programme must be re-designed in order to enable such joint programming. As it stands, the programme is inward looking in terms of funding modes and international participation.</li> <li>A related concern is the brain drain of researchers that is already apparent.</li> </ul>	<ul style="list-style-type: none"> <li>The only ERA-related dimension of the national programme is the international peer review of projects.</li> </ul>





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## 1 Introduction

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As highlighted by the Lisbon Strategy, knowledge accumulated through investment in R&D, innovation and education is a key driver of long-term growth. Research-related policies aimed at increasing investment in knowledge and strengthening the innovation capacity of the EU economy are thus at the heart of the Lisbon Strategy. This is reflected in guideline No. 7 of the Integrated Guidelines for Growth and Jobs.<sup>7</sup> This advocates increasing and improving investment in research and development (R&D), with a particular focus on the private sector. For the period 2008 to 2010, this focus is confirmed as main policy challenge and the need for more rapid progress towards establishing the European Research Area, including meeting the collective EU target of raising research investment to 3% of GDP, is emphasised.

A central task of ERAWATCH is the production of analytical country reports to support the mutual learning process and the monitoring of Member States' efforts in the context of the Lisbon Strategy and the ambition to develop the European Research Area (ERA). The first series of these reports was produced in 2008 and focused on characterising and assessing the performance of national research systems and related policies in a comparable manner. In order to do so, the system analysis focused on key processes relevant for system performance. Four policy-relevant domains of the research system have been distinguished, namely resource mobilisation, knowledge demand, knowledge production and knowledge circulation. The analysis within each domain has been guided by a set of generic "challenges", common to all research systems, which reflect possible bottlenecks, system failures and market failures which a research system has to cope with. The analysis of the ERA dimension still remained exploratory.

The country reports 2009 build and extend on this analysis by focusing on policy mixes. Research policies can be a lever for economic growth, if they are tailored to the needs of a knowledge-based economy suited to the country and appropriately coordinated with other knowledge triangle policies. The policy focus is threefold:

- An updated analysis and assessment of recent research policies
- An analysis and assessment of the evolution of national policy mixes towards Lisbon R&D investment goals. Particular attention is paid to policies fostering private R&D and addressing its barriers.
- An analysis and assessment of the contribution of national policies to the realisation of the ERA. Beyond contributing to national policy goals, which remains an important policy context, ERA-related policies can contribute to a better European level performance by fostering, in various ways, efficient resource allocation in Europe.

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<sup>7</sup> COM(2007) 803 final, "INTEGRATED GUIDELINES FOR GROWTH AND JOBS (2008-2010)", [http://ec.europa.eu/growthandjobs/pdf/european-dimension-200712-annual-progress-report/200712-annual-report-integrated-guidelines\\_en.pdf](http://ec.europa.eu/growthandjobs/pdf/european-dimension-200712-annual-progress-report/200712-annual-report-integrated-guidelines_en.pdf)

## 2 Characteristics of the national research system and assessment of recent policy changes

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### 2.1 Structure of the national research system and its governance

Malta is the smallest member of the European Union with the highest population density (1,287.8 inhabitants per km<sup>2</sup>) and a real GDP growth rate of 3.9 in 2007 compared to the EU27 average of 2.9 ([Eurostat](#)). According to Eurostat data for 2007, Malta's total expenditure on research and development (R&D) stood at 0.60% of Gross Domestic Product (GDP)<sup>8</sup>, equivalent to circa €32.68m, which is well below the estimated 1.83% of the EU27<sup>9</sup>.

Public expenditure on research and development reached 0.21% of GDP equivalent to approximately €11.3m in 2007 (National Statistics Office, NSO 2008<sup>10</sup>). This figure represents mainly research undertaken by the University of Malta. Government R&D Expenditure (GERD) stood at 0.02% GDP; business expenditure on R&D increased from 0.08% in 2004 to 0.39%<sup>11</sup> in 2007.

#### Main actors and institutions in research governance

R&D policy has been given a strong business-orientation balanced with due attention to national government priorities, such as energy, environment and water. Figure 1 below is the most recent snapshot of the national research system in Malta. It lists the principal political bodies responsible for research and innovation (first tier), the operational ministries and entities involved in implementing policies and measures (second tier) and the research performers (third tier).

There has been a shift in responsibility for science and technology policy and research from the [Office of the Prime Minister](#) (OPM) that took over these portfolios in 2005, to the [Ministry for Resources and Rural Affairs](#). The OPM championed the drafting and launch of the [National Research and Innovation Strategy](#) (2006), and today the implementation of this strategy is being monitored and coordinated by the Rural Affairs Minister, who is also following research and innovation developments at European level. OPM maintains a strategic role in determining priorities for research and innovation in the Cohesion Policy 2007-2013, through the [Planning & Priorities Coordination Division](#) (PPCD) which is the national authority managing the Structural Funds and evaluating proposals including those related to research and innovation.

In order to reinforce the policy coordination across ministries, the government set up in 2006 an Intra-Governmental Committee for Research and Innovation that was active in consultations leading to the drafting of the national R&I strategy. Future developments, in terms of coordination of R&I policy/initiatives across ministries, will require further monitoring as these begin to unfold in the forthcoming five-year legislature.

The [Council for Science & Technology](#) (MCST) that fell under the responsibility of the OPM during 2005-2006 has been relocated within the Resources and Rural Affairs

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<sup>8</sup> This is a provisional value provided by Eurostat

<sup>9</sup> This is an estimate for EU-27 countries, Eurostat

<sup>10</sup> National Statistics Office (NSO) 2008 'Expenditure on R&D in the general government sector: 2005-2007', Press Release 20 June 2008

<sup>11</sup> This is a provisional value for 2007, Eurostat

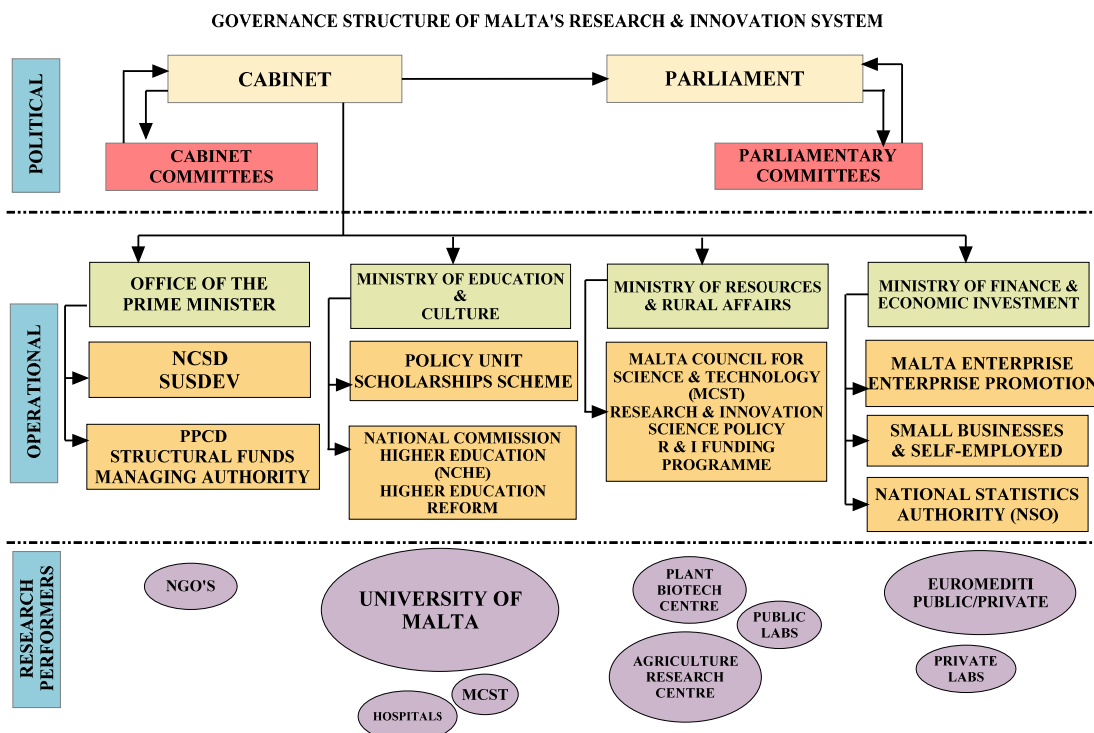
Ministry; its key roles lie in implementing the national R&I strategy and managing the national funding programme. It is also in the process of drafting action plans for the setting up of platforms of strategic importance in niche sectors (with priority towards Health-Biotech and Manufacturing) and coordinates Malta's participation in the EU's Framework Programme for Research and Technology Development (FP).

Other key ministries with horizontal responsibilities for research and innovation include the [Ministry of Education, Culture, Youth & Sport](#) and the [Ministry of Finance, Economy & Investment](#). The Education Ministry is currently overseeing the reform of the higher education sector (through the [Commission for Higher Education](#), NCHE) and manages undergraduate and postgraduate scholarship funds for encouraging further training and researcher mobility. The Finance Ministry, through Malta Enterprise, deals mainly with enterprise policy and with implementing Enterprise Aid Schemes.

The National Strategic Plan for Research & Innovation calls for shared competencies among relevant public institutions in implementing R&I policy and measures. In terms of STI policy *coordination*, MCST has an important 'oversight facility' on science and technology policy initiatives through maintaining close links with key players in the national research and innovation system, including with Malta Enterprise, NCHE and the university. Malta Enterprise is tasked with implementing the new [Malta Enterprise Act 2007](#) that encompasses a research and innovation pillar and in managing the Aid Schemes for Enterprise co-financed by the European Regional Development Fund (ERDF) 2007-2013. Moreover, close collaboration on the reform of the higher education system is ongoing between MCST and NCHE.

The Advisory Council of the MCST draws expertise from the public and private sectors and academia and serves as a platform for national players to submit recommendations on strategies and priorities to government through MCST.

**Figure 1: Overview of the governance structure of the MALTA's research system**



## Main research performer groups

The main R&D performer is the [University of Malta](#) and its institutes providing RD&I support and services to industry and government. University-industry partnerships are emerging more strongly through collaborative projects supported under the [national R&I funding programme](#). Public laboratories and research centres rely heavily on government funding for their operations and their research is geared towards the priorities of the relevant ministries affording for limited coordination of practice and resources. To date there is no inventory on the number of private research laboratories and on the extent of the research that they undertake. The private sector is dominated in large part by small and medium sized enterprises (SMEs) and micro-enterprises, in which R&D activity is low to minimal, and a group of large multinational firms specialising in electronics for manufacturing and generic pharmaceuticals.

## *2.2 Summary of strengths and weaknesses of the research system*

The analysis in this section is based on the ERAWATCH Analytical Country Reports 2008 which characterised and assessed the performance of the national research systems. In order to do so, the system analysis focused on key processes relevant for system performance. Four policy-relevant domains of the research system have been distinguished, namely resource mobilisation, knowledge demand, knowledge production and knowledge circulation. The analysis within each domain has been guided by a set of generic "challenges", common to all research systems, which reflect possible bottlenecks, system failures and market failures a research system has to cope with. The Analytical Country Report for the specific country can be found in the [ERAWATCH web site](#).

The National Strategic R&I Plan provides direction for prioritizing research investments in areas of national importance with a strong business orientation. The challenge of developing more sector-specific R&I strategies and measures is addressed in the new R&I Plan through the setting up of the Platforms of Strategic Importance in the key priority areas (ICT, Energy-Environment, Health-Biotech and High Value-added Manufacturing). The plan introduces a number of targets based on performance indicators in order to allow for "effective health checking of the R&I landscape in Malta".

In 2008 positive momentum was recorded in the implementation of a number of the Plan's recommendations with a wider mix of supply-side and demand-side measures such as the introduction of new research funding and fellowship schemes, enterprise aid schemes to promote R&I and public procurement for R&I. A key challenge lies in the increased coherence and coordination of these policies and measures across different ministries and public entities with shared competencies in R&I (such as the Council for Science & Technology and Malta Enterprise). Another critical aspect is to tailor the design and implementation of policies and measures to address the national context. For example, the new Enterprise Aid Schemes are aimed at promoting innovation activity among small and medium sized enterprises (SMEs) and more generally instil an entrepreneurial culture in order to boost private sector R&I. Such policy-learning would benefit from the evaluation of existing programmes.

The substantial increase in funding for R&I is mainly tied to the second programming period of structural funds (2007-2013) that often raises issues of delays in start-up

and timely access of these funds. The structural funding earmarked for R&I over the six-year period represents the only long-term commitment of public and EU funds for research and innovation. Otherwise the research system lacks multiannual funding programmes given that current funding schemes, such as the national R&I funding programme, institutional funds allocated to the university and scholarship schemes, operate on an annual budgetary basis.

The knowledge absorption capacity of local enterprise remains restricted by the fact that this sector is dominated by small and medium-sized and micro-enterprises wherein R&I activity is low. Thus, further incentives are needed to leverage private sector involvement in research and innovation activities in collaboration with academia and the public sector.

**Table 1: Summary assessment of strengths and weaknesses of the national research system**

Domain	Challenge	Assessment of strengths and weaknesses
Resource mobilisation	Justifying resource provision for research activities	<ul style="list-style-type: none"> <li>Research and innovation (R&amp;I) were given a higher profile when responsibility for R&amp;I was taken over by the Office of the Prime Minister in 2005 and continue to be supported through implementation of the National Strategic Plan for Research &amp; Innovation 2007-2010</li> <li>The Plan sets for the first time targets for boosting the country's R&amp;I investments in defined priority areas.</li> </ul>
	Securing long term investment in research	<ul style="list-style-type: none"> <li>Long-term investments in research are mainly those tied to European funding (Structural Funds); this may give rise to time delays in implementation of projects.</li> <li>For the period 2007-2013 research and innovation projects are being funded through the priority axis on Knowledge &amp; Innovation of the Cohesion Policy.</li> <li>Ministries and public agencies receive their annual budgets as block funding from the central government so that generally there are no multi-annual funding cycles/programmes. The National R&amp;I funding programme follows a yearly budget cycle.</li> <li>Malta has a good track record of participation in EU's <a href="#">Framework Programme for Research (FP)</a>.</li> </ul>
	Dealing with barriers to private R&D investment	<ul style="list-style-type: none"> <li>Although business sector investment in R&amp;D has risen from 0.08% to 0.39<sup>12</sup>% of GDP over the period 2004-2007, this is still low in comparison with the EU average.</li> <li>A new package of incentives was launched in 2008 by Malta Enterprise to promote international competitiveness, innovation, research and e-business development. These schemes are supported through structural funds.</li> <li>Initiatives are underway to generate demand for R&amp;I through public procurement for research and innovation.</li> </ul>
	Providing qualified human resources	<ul style="list-style-type: none"> <li>The national landscape is characterised by a low percentage of S&amp;T graduates and researchers, with the additional concern of a brain drain of graduates.</li> </ul>

<sup>12</sup> this is a provisional value for 2007 according to Eurostat, as at 26<sup>th</sup> February 2009

Domain	Challenge	Assessment of strengths and weaknesses
Knowledge demand	Identifying the drivers of knowledge demand	<ul style="list-style-type: none"> <li>The National Foresight Project and other future-oriented exercises (e.g., addressing the higher education reform and innovation in enterprise) have provided key input into the updating of the RTDI Strategy and helped flag niche sectors in which to target public research investments.</li> </ul>
	Co-ordination and channelling knowledge demands	<ul style="list-style-type: none"> <li>Mechanisms for coordinating knowledge demand between different sectors of the research system are not well developed.</li> </ul>
	Monitoring of demand fulfilment	<ul style="list-style-type: none"> <li>The evaluation of policies and programmes and their impacts is still in an embryonic phase.</li> </ul>
Knowledge production	Ensuring quality and excellence of knowledge production	<ul style="list-style-type: none"> <li>International peer-review of the public research funding programme ensures quality of knowledge production and transparency.</li> </ul>
	Ensuring exploitability of knowledge	<ul style="list-style-type: none"> <li>Malta has low levels of patent applications and licences compared to the EU25 average and needs to build more momentum towards defining an Intellectual Property Rights (IPR) strategy.</li> </ul>
Knowledge circulation	Facilitating circulation between university, PRO and business sectors	<ul style="list-style-type: none"> <li>The national R&amp;I funding programme facilitates collaboration between academia and the business industry sector.</li> <li>There is insufficient intersectoral researcher mobility.</li> </ul>
	Profiting from international knowledge	<ul style="list-style-type: none"> <li>Malta has a good track record of international collaboration such as through the EU's FP, <a href="#">COST</a><sup>13</sup> and other international programmes (<a href="#">UNEP</a><sup>14</sup>, <a href="#">FAO</a><sup>15</sup>). The highest success rate of participation in FP involves primarily academia, with SMEs lagging behind so far.</li> </ul>
	Enhancing absorptive capacity of knowledge users	<ul style="list-style-type: none"> <li>There is an evident disparity in the private sector: large multinational affiliates undertaking R&amp;I probably account for the largest share of BERD; whilst the more numerous SMEs, that are often family-run micro-enterprises report minimal R&amp;D activity.</li> </ul>

### 2.3 Analysis of recent policy changes since 2008

The contribution of research and research policies to Lisbon goals (as well as to other societal objectives) goes beyond the fostering of R&D investment. It is therefore important to also analyse how other remaining shortcomings or weaknesses of the research system are addressed by the research policy mix. The focus of the section is on the analysis of main recent policy changes which may have a relevant impact on the four policy-related domains.

<sup>13</sup> European Cooperation in Science & Technology

<sup>14</sup> United Nations Environment Programme

<sup>15</sup> Food and Agriculture Organisation

### **Changes in National Reform Programme regarding the role of research in the broader economic growth strategy**

The macroeconomic objectives of the National Reform Programme (NRP) 2008-2010 are to achieve sustainable economic growth and generate a high level of employment. The government's strategy to achieve these goals is that of diversifying the economy towards high value-added sectors that demand higher levels of skills and generate knowledge-intensive activities. These sectors include information communication technologies (ICT), high value added financial and industrial services (e.g. pharmaceuticals), education, health and tourism.

Investments in education and training and the promotion of research and innovation are seen as critical in achieving the transition to a knowledge-based economy. Research and innovation (R&I) have gained increased prominence in the new NRP with an axis dedicated to knowledge and innovation. The NRP measures aim to foster "research and innovation in order to sustain the creation of a high value-added, technology-intensive and knowledge-based economy" (NRP document, p28) and are inspired by the national vision of placing research and innovation at "the heart of the economy to support value-added growth and wealth" (National Strategic Research & Innovation Plan, p5). Thus R&I are seen to play a more direct role in economic growth and contributing to the labour market.

The NRP measures are targeted at achieving Malta's Lisbon objective of investing 0.75% Gross Domestic Product (GDP) in research and innovation by 2010, with 0.30% GDP contributed by the public sector and 0.45% derived from private R&D expenditure. The microeconomic pillar of the NRP proposes actions to unlock business potential; invest in knowledge and innovation; and ensuring energy and mitigating climate change.

The investments are earmarked principally at strengthening infrastructures (NRP Measure 3.0), human resources capacity building (NRP Measure 3.1), supporting research and innovation in enterprise (NRP Measure 3.3) and encouraging industry-academia collaboration through the national R&I funding programme and the setting up of a manufacturing and health research strategies (NRP Measures 3.2, 3.4).

There is evidence of more synergies in the implementation of policies and measures for R&I, where NRP measures are inspired by the objectives of the National Strategic Reference Framework 2007-2013 and the recommendations of the National Strategic R&I Plan. Most of the NRP measures are being supported through structural funding.

The European Research Area (ERA) dimension is more explicitly embedded in the NRP, the latter specifying Malta's intention to participate in a joint programming activity in an area where there is an indication of significant take-up at national level (NRP document, p63).

#### **2.3.1 Resource mobilisation**

An estimated €89m have been ring-fenced so far for R&I initiatives through the second programming period of structural funds over 2007-2013 under the Knowledge & Innovation axis (with 85% EU funding: 15% national funding). The bulk of these have been channelled towards building new infrastructures (such as the new ICT faculty at the university) and strengthening existing laboratories for example in



engineering, biotechnology and chemistry, principally at the university and college for Arts, Science & Technology (€49m). The enterprise aid schemes alone have been allocated a total of €20m to promote [innovation](#), [e-business development](#) and an R&D grant (see [Section 3.3.2 on 'Policy Mix Routes'](#)).

Since Malta's economic development relies heavily on human resources, the issue of investing in a skilled human resource base is central in sustaining a shift towards a knowledge-based economy (some of the challenges in this regard are discussed in [section 3.3.2](#) on the 'importance of education and innovation policies' of this report). In 2008-2009, new initiatives supporting human capacity building were launched. In addition to the existing [Scholarship Scheme for Post-Graduate studies](#), a new STEPS (Strategic Educational Pathways Scholarships) scheme was launched in 2009 to support MSc. and PhD studies in priority areas including science and technology. This scheme implements Measure 3.1 of the NRP 2008-2010 and is co-financed by the European Social Fund, ESF (€10m over 2008-2013).

A new fellowship scheme, with €3m ESF co-funding, is promoting two-way mobility of early stage post-doctoral researchers and will contribute to the ERA dimension on opening up researchers careers (see [Section 4.1.1](#)). The scheme intends to build a researcher community at the university of Malta by training Maltese researchers abroad and building new curricula in designated subject areas.

In summary, the first NRP was not very ambitious in terms of proposing specific measures to boost R&I. Whether Malta will lag behind in achieving its set goals, will be determined largely by the efficacy of implementing the specific measures in the second NRP that are more focussed on a number of the key recommendations of the National Strategic R&I Plan. The fact that such measures are supported principally through structural funding may create delays in terms of accessing funds in a timely manner.

**Table 2: Main policy changes in the resource mobilisation domain**

Challenges	Main Policy Changes
Justifying resource provision for research activities	<ul style="list-style-type: none"> <li>The NRP 2008-2010, through its pillar on research and innovation is supporting enhanced investments in R&amp;I. Many of its measures are supported through structural funding streams.</li> </ul>
Securing long term investments in research	<ul style="list-style-type: none"> <li>Long-term research investments, an estimated €89m, through the second programming period of structural funds over 2007-2013;</li> <li>Manufacturing and health-biotech platforms and research plans prioritized in 2007-2013.</li> </ul>
Dealing with uncertain returns and other barriers	<ul style="list-style-type: none"> <li>A public procurement plan is being drafted by MCST through consultation with key stakeholders;</li> <li>Enterprise Aid Schemes promoting innovation in enterprise launched in 2008.</li> </ul>
Providing qualified human resources	<ul style="list-style-type: none"> <li>New bursary schemes for post-graduate researchers earmarking science and technology subjects (STEPS scheme) and post-doctoral fellows intended to strengthen the research community and attract inward mobility.</li> </ul>

### 2.3.2 Knowledge demand

The NRP 2008-2010 prioritizes the setting up of platforms of strategic importance in manufacturing and health in line with the recommendations of the National Strategic

R&I Plan (NRP Measure 3.4). The aim is to draw out detailed research plans for these areas that address the needs of the sectors. The manufacturing sector has received financial support over the 2008-2013 period for the drafting of an action plan and roadmap and the implementation of research projects that will support the transition of the industry to a high-tech sector (circa €716,000 structural funding).

The Manufacturing Platform aims to involve key stakeholders (policy makers, industry associations, higher education institutes) to discuss the problem areas facing industry, and to establish how research can contribute towards addressing these issues and towards strengthening the competitiveness of local industry. The platform will also organize events such as workshops and consultation sessions with a wider audience.

**Table 3: Main policy changes in the knowledge demand domain**

Challenges	Main Policy Changes
Identifying the drivers of knowledge demand	<ul style="list-style-type: none"> <li>In 2009-2013, priority is being given to developing a research plan and roadmap for the manufacturing sector that will identify research focus areas ways for making local industry more competitive.</li> </ul>
Co-ordinating and channelling knowledge demands	<ul style="list-style-type: none"> <li>Wider stakeholder consultations and involvement is planned to identify niche areas of research for priority sectors.</li> </ul>
Monitoring demand fulfilment	<ul style="list-style-type: none"> <li>No specific developments to report on.</li> </ul>

### 2.3.3 Knowledge production

The main developments here relate to initiatives undertaken as part of the university reform. A quality assurance framework is being introduced that benchmarks career progression against research output (in terms of publications) and teaching output.

The new collective agreement for academic staff signed in 2009 stipulates that intellectual property (IP) rights will belong to the university and no longer to the individual researcher to try and make for more effective commercial exploitation of knowledge. An ad hoc committee was set up within the university in order to work on the formulation of an IP policy however to date the university still lacks an IPR strategy.

**Table 4: Main policy changes in the knowledge production domain**

Challenges	Main Policy Changes
Improving quality and excellence of knowledge production	<ul style="list-style-type: none"> <li>Quality assurance framework for university research and teaching.</li> </ul>
Ensuring exploitability of knowledge production	<ul style="list-style-type: none"> <li>The Manufacturing Platform (Table 3 above) will serve as a 'virtual' cluster bringing together pools of knowledge from the industry and academia.</li> <li>IP rights to rest with the university and not the individual researcher.</li> </ul>

### 2.3.4 Knowledge circulation

There are no updates to report on in terms of facilitating knowledge circulation. Opportunities for inter-sectoral R&D cooperation remain those offered through the national R&I Funding Programme and initiatives such as Eureka and the [Business Technology Network](#) co-ordinated by Malta Enterprise.

In terms of enhancing absorptive capacity of knowledge users, recent measures relate 1) to promoting research and innovation activity (process, product and organizational innovation) among SMEs so as to increase R&I activity ([InnovAct Scheme](#)); and 2) skills building programmes that match labour market demands. Examples of the latter include programmes at the [College for Arts, Science & Technology](#) (MCAST) in emerging areas such as aviation maintenance and ICT and post-graduate training in strategic subject areas (including pharmaceuticals, fisheries and agriculture, creative industries, science and technology).

**Table 5: Main policy changes in the knowledge circulation domain**

Challenges	Main Policy Changes
Facilitating knowledge circulation between university, PRO and business sectors	<ul style="list-style-type: none"> <li>• No policy changes to report on.</li> </ul>
Profiting from access to international knowledge	<ul style="list-style-type: none"> <li>• The importance of Foreign Direct Investment (FDI) is growing – see <a href="#">Section 3.3.2</a>;</li> <li>• Positive trend in Malta’s participation in FP7.</li> </ul>
Absorptive capacity of knowledge users	<ul style="list-style-type: none"> <li>• Enhancing SME participation in R&amp;I through the InnovAct Scheme;</li> <li>• Skills training programmes at tertiary level to meet demands of the labour market in new emerging sectors and those earmarked by government in its Vision 2015 (tourism, financial services, health, education, manufacturing and value-added);</li> <li>• New STEPS post-graduate scheme for PhDs, also in science and technology.</li> </ul>

## ***2.4 Policy opportunities and risks related to knowledge demand and knowledge production: an assessment***

Following the analysis in the previous section, this section assesses whether the recent policy changes respond to identified system weaknesses and take into account identified strengths.

The dedication of a substantial portion of structural funds for research and innovation system is addressing the National Strategic R&I Plan’s objectives of strengthening infrastructures and human resources in R&I (see Sections 3.3.1 and 3.4 for further insight). More sector specific policies and strategies are being developed through the setting up of platforms of strategic importance. The new manufacturing platform, a project entrusted to the Council for Science & Technology, will address the competitive needs of the industry, with funds also allocated for implementing research projects. Such platforms should also facilitate knowledge circulation among industry and academia.

The reform of the higher education sector is re-orienting the education system to provide the necessary skills base in emerging areas in the labour market. Thus the introduction of post-graduate scholarships and skills training programmes aims to produce a highly trained workforce in key sectors specified in the government’s Vision 2015 (tourism, financial services, health, education, manufacturing and value-added and Gozo as an ecological island).

The new fellowship scheme, co-financed through the European Social Fund, will establish a post-doctoral research community in areas of priority in order to

strengthen the university’s research infrastructure and create further opportunities for international collaboration (see [Section 4.1.1. of this report](#)).

A policy opportunity lies in implementing a nation-wide science popularisation strategy that will serve not simply to attract more S&T careers but also to generally instil a culture for entrepreneurship across the education chain; the latter could serve to create further opportunities for knowledge demand and circulation.

Since the government’s vision is that of favouring business-oriented research with innovative applications, there may be overlaps in governance and implementation of research and innovation policies and initiatives. This introduces the challenge of ensuring adequate dovetailing of policies and measures across relevant government ministries and in relevant sectors.

**Table 6: Summary of main policy related opportunities and risks**

Domain	Main policy related opportunities	Main policy-related risks
Resource mobilisation	<ul style="list-style-type: none"> <li>• Two-way mobility of researchers to amplify the university’s research base.</li> <li>• NRP Measure 3.2 to increase investments in the national R&amp;I funding programme and opening up to joint activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Delay in approval of R&amp;D grants for enterprise;</li> <li>• Lack of multi-annual budgets for public research entities, including the university.</li> </ul>
Knowledge demand	<ul style="list-style-type: none"> <li>• Action plan and research strategy for the manufacturing sector affords for better integration of knowledge demands.</li> <li>• Action plan for public procurement.</li> </ul>	<ul style="list-style-type: none"> <li>• Limited culture for evaluation of research programmes.</li> </ul>
Knowledge production	<ul style="list-style-type: none"> <li>• Addressing the university’s third mission i.e. that of re-orienting its functions towards addressing more closely the socio-economic and cultural context.</li> </ul>	<ul style="list-style-type: none"> <li>• No intellectual property (IP) strategy in place.</li> </ul>
Knowledge circulation	<ul style="list-style-type: none"> <li>• A new science popularisation project aimed at instilling a culture for innovation and risk-taking and ‘marketing’ researcher careers.</li> </ul>	<ul style="list-style-type: none"> <li>• inter-sectoral R&amp;D mobility limited; lack of formal programmes.</li> </ul>

### 3 National policy mixes towards R&D investment goals

The aim of this chapter is to deepen the analysis of national policy mixes with a focus on public and in particular **private R&D investment**. The Lisbon strategy emphasises an EU overall **resource mobilisation objective** for 2010 of 3% of GDP of which two thirds should come from private investment. R&D investment is seen as important yardstick for the capacity of an economy to turn the results of science and research into the commercially viable production of goods and services and hence knowledge into growth. Corresponding investment policies are mainly pursued at national level and determined with a national focus.

The chapter is structured around five questions:

1. What are the specific barriers in the country that prevent reaching the Lisbon goal? What barriers exist in the country to prevent reaching the specific targets, particularly related to the private sector R&D investments?

2. Given the above, what are the policy objectives and goals of the government that aim to tackle these barriers?
3. What Policy Mix routes are chosen to address the barriers and which specific instruments and programmes are in operation to implement these policies?
4. What have been the achievements in reaching the above mentioned R&D investment objectives and goals?
5. What are the reasons for not reaching the objectives, adaptation of the goals?

The chapter aims to capture the main dimensions of the national policies with an emphasis on private R&D investment. The chosen perspective of looking at investments in R&D is the concept of Policy Mixes. The analysis and assessment follows a stepwise approach following the five questions mentioned above.

### ***3.1 Barriers in the research system for the achievement of R&D investment objectives***

In 2007, the total investment in R&D (GERD) reached 0.6% of Gross Domestic Product (GDP) equivalent to approximately €32.68m; this is below Malta's Lisbon target of investing 0.75% GDP in research and innovation and well below the EU27 average of 1.83%GDP<sup>16</sup>. Of the total GERD, the business sector (BERD) accounted for 0.39%<sup>17</sup> GDP, the government sector 0.02% and the higher education sector 0.19%GDP.

Over the period 2005-2007, public expenditure on R&D (taken as government plus higher education expenditures) showed a modest increase from 0.19% to 0.21% GDP. This can be traced mainly to increased investments in the higher education sector, where the University of Malta and the College for Arts, Science and Technology (MCAST) were the principal beneficiaries. The amount of structural funding invested in R&I-related initiatives in the first programming period 2004-2006 (estimated at approx. €7m) was not such as to have a significant impact on the GERD. The larger proportion of structural funds earmarked for R&I in 2007-2013, an estimated €89m or approx. 9% of the total structural funds allocated to Malta for this period, will have medium- to long-term impacts on the research system.

In the [European Innovation Scoreboard](#) (EIS) 2008 classification, Malta remains in the group of "catching-up" countries characterized by the lowest innovation performance compared to the EU27 average, exhibiting a moderate growth rate in this group. It is experiencing fast performance growth rates in certain indicators such as throughputs (patents and community designs) and has relative strengths in finance and economic effects, where it was the only catching-up country with an above-EU average performance<sup>18</sup>. Firm investments have recorded an improvement.

The weaknesses identified in the EIS 2008 and the [Trendchart country Reports 2006-2007](#), signal some of the barriers towards achieving Malta's Lisbon target for R&D investments. These are the insufficiency of human resources for R&D, generally low levels of entrepreneurship and innovation, and the availability of R&I infrastructures.

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<sup>16</sup> Eurostat data, accessed on 8<sup>th</sup> February 2009

<sup>17</sup> This is a provisional value provided by Eurostat, as at 8<sup>th</sup> February 2009

<sup>18</sup> European Innovation Scoreboard 2008

The specific barriers for the private sector range from a limited culture for R&I permeating among enterprise to structural factors relating to excessive bureaucratic and administrative procedures in government departments, insufficient access to international markets<sup>19</sup> and availability of R&I infrastructures.

Business R&D rests critically on a cluster of large firms in high value-added manufacturing sectors such as electronics and generic pharmaceuticals that are attracting foreign direct investments; whilst the majority of indigenous firms are low tech micro-enterprises and small and medium-sized enterprises (SMEs). In 2006, the Post and Telecommunications sector represented the highest percentage share of total innovation expenditure, at approximately 21%, followed by the Food and Beverages sector at 20%. The Chemicals and Chemical products sector recorded the highest intramural Research and Development expenditure at approximately 29%. Small firms tend to innovate most, mainly exhibiting product innovations, compared to larger firms that specialise in both product and process innovations<sup>20</sup>.

The results of the [Business & Innovation Survey 2006](#) undertaken by the National Statistics Office<sup>21</sup> indicate that a low percentage of enterprises (19% of the respondents) are effectively engaged in product and/or process innovations and that the principal barriers hampering innovation are the high innovation costs and the lack of own funds.

### **3.2 Policy objectives addressing R&D investment and barriers**

Malta's Lisbon target is that of achieving a total investment of 0.75% GDP in research and innovation by 2010, with 0.30% GDP contributed by the public sector and 0.45% derived from private R&D expenditure.

The specific objectives for boosting R&D investments, as detailed in the National Strategic R&I Plan and the new NRP 2008-2010, include:

- Focussing state financing on the setting-up of Platforms of Strategic Importance, characterised by stronger links amongst the private and public sectors and academia, in areas that have the potential to stimulate value-added RTDI; these are Energy-Environment; Health-Biotech; ICT and high value-added Manufacturing. In the light of Malta's limited human and financial resource capacity, investments are being channelled towards those sectors and activities that can provide a medium to long-term return for the economy.
- Industrial restructuring from traditional sectors towards high-tech manufacturing (such as biotechnology and pharmaceuticals) that attract Foreign Direct Investment (FDI) and services sectors (including health and financial services).
- Promoting business R&I, especially among indigenous SMEs, at a number of levels: by providing adequate incentive schemes for businesses to innovate (NRP Measure 3.3); creating an innovation-friendly business environment; increasing awareness on the use of Intellectual Property (IP); tapping new markets; and encouraging the use of ICT to manage business.

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<sup>19</sup> Malta Federation of Industry "Position Paper on Pre-Budget 2009 Consultation Process"

<sup>20</sup> National Statistics Office "Business Research & Innovation" News Release No.166/2008 released 23<sup>rd</sup> September 2008

<sup>21</sup> National Statistics Office "Business Research & Innovation" News Release No.166/2008 released 23<sup>rd</sup> September 2008

- Stimulating the innovation system by creating a greater demand for R&I through public procurement (NRP Measure);
- Supporting private R&D through collaborative research projects with academia, with priority to High Value-Added Manufacturing (NRP Measure 3.4).

### **3.3 Characteristics of the policy mix to foster R&D investment**

This section is about the characterisation and governance of the national policy and instrument mix chosen to foster public and private R&D investment. While policy goals are often stated at a general level, the policy mix has a focus on how these policy goals are implemented in practice. The question is what tools and instruments have been set up and are in operation to achieve the policy goals? The following sections will each try to tackle a number of these dimensions.

#### **3.3.1 Overall funding mechanisms**

This section describes how public funds for research and innovation are distributed among the main actors in the national R&I system. It includes a brief assessment on the allocation of structural funds for research.

By considering 2007 as a base year, one notes that the national R&I budget is steered towards building research capacity in the public sector. The focus is on institutional funding that supports primarily the University of Malta, as well as the ministries and public research centres, in carrying out their institutional tasks including research. Institutional funding, allocated as block funding to these entities, represented more than 80% of the total *public* investments in R&I. The share of the public budget dedicated to private sector-type research or innovation is minimal, estimated at approximately €0.17m<sup>22</sup> (or 0.8% of BERD).

A similar scenario is evident if one looks at the distribution of structural funds (SF) for the second programming period (2007-2013); the largest proportion of these, just over 55% of the total SF invested in R&I, has been allocated for infrastructural capacity building within the higher education sector, principally the University of Malta and the College for Arts, Science & Technology MCAST. This is followed by investments in human resource capacity building i.e. post-graduate scholarship and skills building schemes and post-doctoral bursaries (approx. 22% of the total). The co-financing ratio is 85% EU funds and 15% national funds. (The Erawatch Country Profile for Malta – Section [‘Role of European and International Funding’](#) provides additional insight on impacts of SFs).

Competitive funding is that provided through the [National R&I Funding Programme](#) that has been running since 2006; although it represents an important instrument for public-private collaboration, its annual budget of €700,000 restricts the number of projects that it can support. It is a thematic instrument promoting research in the four areas of strategic importance (Energy-Environment, Health-Biotech, ICT and High Value-Added Manufacturing). Other modes of public funding include the government’s investment in the Euro-Mediterranean Initiative on Research and Innovation ([EuroMediTi](#)) that is targeting areas of importance in the region such as water and environment, sustainable energy, ICT and marine technology.

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<sup>22</sup> Source: Eurostat data for 2007.

Public funding for private R&D has seen an evolution in the type of instruments supported, from those based solely on tax incentives and loan guarantees to a wider mix of fiscal incentives and grants for innovative projects and research and development. Examples of the latter include participation in [Eureka](#) and the new package of Enterprise Aid Schemes co-financed through the European Regional Development Fund (with a total allotment of €20m over 2007-2013).

As mentioned, there is a trend to stimulate research in specific sectors of economic importance and public funds for research are being channelled towards these areas in line with the recommendations of the National Strategic R&I Plan; these sectors were mapped in close consultation with key stakeholders when the Plan was being drafted. Thus, the infrastructural investments at the university and MCAST are aimed at strengthening areas such as engineering and materials testing, biotechnology and ICT. Some of the Enterprise Aid Schemes (e.g. Small Start-up Grant, [SME Development Grants](#)) specify the eligible sectors for participation as including ICT, eco-innovation, manufacturing and biotech. Notwithstanding, the National Strategic R&I Plan does provide leeway for public funds to be allocated to new areas in response to emerging opportunities (Recommendation No.5<sup>23</sup>).

### 3.3.2 Policy Mix Routes

The “Policy Mix Project” identified the following six ‘routes’ to stimulate R&D investment:

1. promoting the establishment of new indigenous R&D performing firms;
2. stimulating greater R&D investment in R&D performing firms;
3. stimulating firms that do not perform R&D yet;
4. attracting R&D-performing firms from abroad;
5. increasing extramural R&D carried out in cooperation with the public sector or other firms;
6. increasing R&D in the public sector.

The routes cover the major ways of increasing public and private R&D expenditures in a country. Each route is associated with a different target group, though there are overlaps across routes. The routes are not mutually exclusive as, for example, competitiveness poles of cluster strategies aim to act on several routes at a time. Within one ‘route’, the policy portfolio varies from country to country and region to region depending on policy traditions, specific needs of the system etc.

#### **Route 1: Promoting the establishment of new indigenous R&D performing firms**

Apart from investing in the hard infrastructures that facilitate the setting up of business operations (such as the upgrading of industrial zones, the expansion of facilities at the [Business Incubation Centre](#) and the setting up of a Biotech park, [2009 Budgetary measure](#)), public funds are being deployed to support a [Start-Up incentive scheme](#) that part-finances initial operational costs – enterprises involved in research and innovation are eligible to apply for grants under this incentive.

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<sup>23</sup> Office of the Prime Minister ‘National Strategic Plan for Research & Innovation’, p58.



At a more general administrative level, the government is working to simplify procedures associated with the setting up of business operations (e.g. reducing paper work, processing of applications etc.).

Additional insight on this Route is provided in Section 3.2 on 'Specific Policies and Programmes for Innovative Start-ups' of [the Malta Trendchart Report 2008](#).

## **Route 2: Stimulating greater R&D investment in R&D performing firms**

This route has seen an evolution along two strands: 1) in the type of instruments supporting R&D investments (shift from fiscal schemes only to the provision of grants) and 2) its increased budgetary weight, with €9m allotted for an R&D grant that should be launched in 2009 – these funds are tied to the second programming period of structural funds 2007-2013 that co-finances 85% of the total grant.

In 2005, firms could benefit only from fiscal incentives under the [Business Promotion Act](#) (BPA) and thus were not provided with financial support for operational purposes. The R&D tax credit and e-business tax credit were originally geared to attract foreign direct investors (Route 4) but were later adapted to support established local companies<sup>24</sup>. A number of success stories in technology transfer were also recorded via the [Innovation Relay Centre](#) (IRC) Network.

When the new [Malta Enterprise Act](#) (2007) and implementing Guidelines were launched, a greater emphasis was placed on providing financial incentives for R&D; such as through participation in Eureka (in 2006) as well as the ERDF-financed R&D Grant Scheme mentioned above. There are also incentives providing grants for innovative activity but these are mainly targeted at SMEs e.g. InnovACT (€1.5m) and other schemes under which R&D is an eligible activity for claiming funding, such as the [SME Development](#) Grant Scheme.

## **Route 3: Stimulating firms that do not perform R&D yet**

The [National Strategic R&I Plan](#) recommends the need to create an enabling environment for enterprise that is conducive to research and innovation<sup>25</sup>, especially in the light of the fact that most indigenous firms (the bulk of which are SMEs) exhibit a low research and innovation performance. The four sectors Energy-Environment, ICT, Health-Biotech and High Value-Added Manufacturing are being prioritized.

A number of initiatives were launched to incentivize innovative activity across the business landscape with a focus on SMEs. Examples include the [InnovAct scheme](#) that addresses product/process and organisational innovations; the [e-business Development Grant](#) that encourages the use of information technology in business operations as well as an Energy Saving Scheme<sup>26</sup> (€10m Structural Funds) that promotes eco-efficiency (energy saving measures and eco-audits) and the use of alternative energies in business.

## **Route 4: Attracting R&D-performing firms from abroad**

Securing foreign direct investment (FDI) is a priority for Malta's economic strategy<sup>27</sup>. The country has secured FDIs in a number of sectors that are attracted by the stable

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<sup>24</sup> UNU-MERIT 'Policy Mix Country Review Malta, 2006'

<sup>25</sup> Office of Prime Minister (2006) National Strategic R&I Plan p50.

<sup>26</sup> ERDF Energy Grants Scheme accessed at:

[http://support.maltaenterprise.com/energy//index\\_files/erdf.htm](http://support.maltaenterprise.com/energy//index_files/erdf.htm) on 16th February 2009.

<sup>27</sup> Prime Minister's Budget Speech 2009

macroeconomic environment, the ongoing structural reforms and Malta's enhanced position as a financial and ICT hub in the Mediterranean<sup>28</sup>. The main recipient of FDI inflows in 2005 and 2006 was the financial services sector<sup>29</sup>. In its [World Investment Report for 2008, UNCTAD \(United Nations Conference on Trade and Development\)](#) classified Malta fourth out of the top twenty ranking countries in its inward investment performance index.

An [R&D tax credit](#) and a loan guarantee scheme, were introduced in 2005 under the Business Promotion Act (BPA) which was the principal legislation at the time supporting business development and FDIs. In order to attract more foreign investors, in 2007 the government launched an exercise towards simplification<sup>30</sup> that aims to reduce excessive bureaucracy when setting up a business, such as shortening timeframes for processing applications.

The government has committed to improve the business environment by reducing administrative burdens by 15% in 2012 and is working on drafting a small business act that will provide the regulatory framework for small enterprises to operate and "bolster entrepreneurial activity"<sup>31</sup>.

Apart from the above, the government has invested in a Euro-Mediterranean Initiative on Technology & Innovation (EuroMediTi) that is acting as a technology transfer platform in the region also with the aim of attracting R&D activity to Malta.

#### **Route 5: Increasing extramural R&D carried out in cooperation with the public sector**

Route 5 has gained more prominence through the collaborative research opportunities provided by the National R&I Funding Programme. Investments in this programme are envisaged to increase (NRP Measure 3.2).

The setting up of a platform in manufacturing in 2009 also aims to stimulate collaborative research; key stakeholders in the industry, public sector and academia will be consulted to draft an action plan for research and at least two research projects will be implemented that will address the industry's needs (NRP Measure 3.4).

#### **Route 6: Increasing R&D in the public sector**

Following the objectives of the National Strategic Reference Framework 2007-2013, a priority for Malta is that of sustaining a thriving R&D system through investments in research infrastructures (institutional funding) and human resources - Route 6 is thus a priority.

There are no specific measures for the setting up of Centres of Excellence. The setting up of platforms of strategic importance will assist in building research capacity in areas of economic importance (see [Route 5](#) above).

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<sup>28</sup> Central Bank of Malta Malta's Economy on the Path to the Euro July 2007

<sup>29</sup> National Statistics Office News Release No. 210/2008

<sup>30</sup> Prime Minister's Budget Speech 2009

<sup>31</sup> Prime Minister's budget Speech 2009

## The importance of education and innovation policies

### *Education Policies*

Malta faces a number of challenges both downstream and upstream of its education system that may impinge on its transition towards becoming a knowledge-based economy. At one end, the system has a high proportion of early school leavers with only secondary education or less— this stood at 37.3% in 2007 (which is well above the EU 27 average of 15.3%, Eurostat). At the other end of the education system the challenges relate to increasing the number of graduates, including in science and technology, boosting researchers at the university and more generally anticipate and thus provide the necessary skills for future labour market needs.

A report<sup>32</sup> published by the National Commission for Higher Education (NCHE) highlights the need to invest in new specialisations required by various industries whilst at the same time attempting to maintain a balance between specific and generic skills. The NCHE is attempting to identify the skills gaps that may arise in the future, especially in areas such as ICT, financial services, health and manufacturing in order for these skills to be catered for in education programmes.

Two initiatives relate to: 1) the setting up of a training programme in aviation maintenance within the college for Arts, Science & Technology with the expansion of the Lufthansa Technik Aircraft maintenance facility in Malta; and 2) the new ICT faculty and ICT-related courses at the university that are promoting Malta as a regional centre of excellence in this sector<sup>33</sup>. The provision of a skilled human resource base should serve as a catalyst to attract foreign investments (policy route 4).

Equally, as the government strives to promote life-long learning, skills development and post-graduate training, with specific measures to attract science and technology careers, it must match these with creating opportunities for researchers and skilled workers in the labour market. This is where education policies may serve to leverage R&D investments in the public sector (route 6) and private sector (route 2).

### *Innovation Policies*

It is in general difficult to sieve innovation measures from research measures seeing that Malta does not have a stand-alone research policy and innovation policy but both domains fall under the umbrella of the National Strategic R&I Plan.

Non R&D Innovation policies such as those promoting start-ups<sup>34</sup> (Small Start-Up Scheme) and innovation in SMEs (InnovAct) also target research-performing firms and contribute to policy mix routes 2 and 3. In terms of budgetary weight, non- R&D innovation measures outweigh the R&D measures.

One initiative that integrates research, education and innovation policy domains is the Euro-Mediterranean Initiative on Research and Innovation (Euro-MediTi) that is developing a technology and innovation platform in the Mediterranean for business-driven services in training, applied R&D, customisation of technologies, testing and

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<sup>32</sup> National Commission for Higher Education (2009) Skills for the Future

<sup>33</sup> Ministry for Investment, Industry & Information Technology (2007) 'National ICT Strategy for Malta 2008-2010'

<sup>34</sup> See Sections 3.2 and 3.3 of the [Malta Trendchart 2008 Report](#) for additional insight on innovation and competitiveness policies

prototyping, incubation and dissemination. The initial seed financing for the first years of operation is being supplied by the government (circa €1.4m over four years).

Investments are skewed towards route 6 (increasing R&D in the public sector); whilst route 5 (public-private collaborative R&D) is under-represented. Aid schemes for enterprise mainly address routes 1 and 2 of the policy mix. The system still lacks multiannual programmes.

### Assessment of the importance of policy mix routes and their balance

**Table 7: Importance of routes in the national policy and recent changes**

Route	Short assessment of the importance of the route in the national policy	Main policy changes since 2008
1	The policy mix encourages the establishment of new technology-based firms in the platforms of strategic importance,	An instrument dedicated to innovative start-ups was launched in 2008 (Small Start-up Grant Scheme).
2	The new package of Enterprise Schemes caters more directly for R&D-performing firms by providing a wider mix of incentives including grants for R&D, over and above the already-existing fiscal measures.	There is an increased focus on stimulating research and innovation amongst SMEs with many of the incentive schemes targeting this particular group. The R&D Grant that will target industrial R&D development should be launched in 2009.
3	Here the focus is to stimulate innovative activity other than research in non R&D-performing firms, mainly through indirect measures.	The current stream of measures aims towards making businesses more innovative by adopting measures such as eco-efficient technologies (2009 measure) and e-business practices (2008 measure) and at the same time creating a market for these products and services.
4	This route is part of a broader economic strategy to attract investments from abroad. The instruments, namely loan guarantees and tax credits, that were originally set up to attract FDIs have been adapted to support domestic firms.	Since 2007, a process of simplification of business operations has been launched that should see the reduction of unnecessary administrative and financial burdens for businesses, both local and foreign.
5	Promoting collaborative R&D activities is a high priority on the research policy agenda not least because it fits with the vision of a business-oriented research system. Although the national R&I funding programme has been pivotal in funding R&D collaboration, the budgetary weight of this route remains slim compared to that of other instruments and to the demand for such funds.	The second NRP 2008-2010 prioritizes the setting up of a health and manufacturing platform, thus implementing one of the key recommendations of the National Strategic R&I Plan. Structural funds have been secured to implement research projects addressing the competitiveness of the manufacturing industry.
6	Increasing R&D in the public sector is a priority both in terms of policy attention (the National Strategic Plan for Research & Innovation providing direction for steering investments in strategic areas of economic importance) as well as budget weighting. Institutional funding is at the fore of public R&D investments, together with human resource development.	Structural Funds are having a strong impact in supporting institutional funding: just over €49m out of an estimated total R&I fund of €89m <sup>35</sup> , have been allocated for infrastructural capacity building, mainly in the higher education sector.

<sup>35</sup> The value of €89m represents the share of structural and national funds allocated for research and innovation interventions in the second programming period 2007-2013. The co-financing ratio is 85% Structural Funds: 15% National Funds. The value is only an estimate, as at 1<sup>st</sup> March 2009, since additional funds may be disbursed through additional calls for proposals in 2009.

### 3.4 Progress towards national R&D investment targets

Table 8 below shows Malta's expenditure on R&D over the 2005-2007 period. The increase in public expenditure on R&D is mainly due to an increase in the government budgetary appropriations or outlays for R&D (GBOARD) in the higher education sector (university and MCAST). This is complemented by a substantial increase in structural funds<sup>36</sup> (not included in the table) allocated for infrastructural projects (€49m over 2007-2013), principally at the university, and scholarship and skills training schemes (€20m).

These figures indicate that a substantial portion of funds, both national and structural funds, are being leveraged towards non-competitive public (institutional) funding compared to that for competitive grants. The latter are mainly provided through the national R&I Funding programme that receives an annual budget of €700,000 and research projects linked with the setting up of platforms of strategic importance (see [Section 2.3.2](#) of this report). The NRP does envisage an "increase [in] the funds available for Malta's National R&I funding programme as a means of increasing national investment in R&D<sup>37</sup>" (Measure 3.2); this is not provided for in the 2009 budgetary estimates.

The above measures address one of the barriers of the national research and innovation system which is the availability of R&I infrastructures and should put Malta in a better position to compete at a more equally footing with other Member States for European funding and attract international collaborative projects. However, the impacts of these investments on GERD will become apparent only in the medium to long-term and probably will see Malta struggling to reach its 2010 Lisbon target for public R&D expenditure.

**Table 8: Expenditure on R&D over 2005-2007 period**

	2005	2006	2007	2010 Lisbon Target
Government Expenditure on R&D (GOVERD)	0.03% GDP	0.03% GDP	0.02% GDP	-
Higher Education sector expenditure on R&D (HERD)	0.16% GDP	0.18% GDP	0.19% GDP	-
Public Expenditure on R&D	0.19% GDP	0.21% GDP	0.21% GDP	<b>0.3% GDP</b>
Government Budget Appropriations or Outlays for R&D (GBOARD)	€9m	€10.5m	€11m	-
Private Sector Expenditure on R&D (BERD)	0.41% €19m	0.44% €22m	0.39%* €21m	<b>0.45% GDP</b>
<b>Gross Expenditure on R&amp;D (GERD)</b>	<b>0.6% GDP</b> <b>€29m</b>	<b>0.64% GDP</b> <b>€33m</b>	<b>0.6% GDP</b> <b>€32.68m</b>	<b>0.75% GDP</b>

Source: Eurostat. \*provisional value; No data available for 2008

With regard to boosting business sector R&D, the policy mix has seen an evolution in the type of instruments, target groups and sectors though structural barriers and policy gaps persist and restrain R&I growth in this sector. In 2004, the Business Promotion Act focussed on providing tax concessions on innovative activities as well as other financial incentives such as loan guarantees and royalty schemes. These instruments were targeted towards larger, well-established firms (in fact they were

<sup>36</sup> The co-financing rate for structural funds is 85% EU funding and 15% national funding

<sup>37</sup> Office of the Prime Minister (2008): 'National Reform Programme 2008-2010', p83

originally aimed at attracting FDIs); whilst they had more limited impact on and scope for uptake by SMEs that form the bulk of the Maltese economy. They had little effect in substantially increasing the business expenditure on R&D (BERD) over 2005-2007 where we can assume that much of the R&D was undertaken by the “usual suspects”. Another gap remains the lack of a venture capital (VC) fund; despite a number of attempts to introduce venture capital, this never took off.

As mentioned in [Section 3.1](#) most SMEs perform very little research and innovation activity mainly because of financial constraints but another constraining factor includes the limited innovation and risk-taking culture that prevails among these enterprises.

The above highlights the need to tailor practices and measures to the Maltese context – this has become more evident in recent years where we see a greater emphasis on instruments that are promoting businesses to be more innovative and invest more in research through targeted programmes (routes 2 and 3) as well as opportunities for international collaboration (such as Eureka participation) and tapping EU funds ([FP7 Exploratory Award Scheme](#)). The Enterprise Act (2007) and implementing Aid Schemes contain more pro-active policies fostering research and innovation in a restrict number of areas and with SMEs as the target group for these incentives. These schemes have only been launched in 2008 and their effects on BERD will become apparent in the medium- to long-term.

Another barrier lies in the bureaucratic delays arising when accessing and deploying national and EU funds implementing schemes. For example, grant scheme for industrial R&D has suffered such delays and will only be launched by Malta Enterprise in 2009.

In summary, the progress in achieving national R&D investment targets can be considered satisfactory in terms of the policy response with a wider mix of demand-side and supply-side policies and measures; though slower momentum is recorded in terms of reaching investment targets. In terms of investments, there is a skew towards route 6 (increasing R&D in the public sector); whilst route 5 (public-private collaborative R&D) is under-represented. Aid schemes for enterprise mainly address routes 1 and 2 of the policy mix.

**Table 9: Main barriers to R&D investments and respective policy opportunities and risks**

Barriers to R&D investment	Opportunities and Risks generated by the policy mix
Human resources in R&I	<ul style="list-style-type: none"> <li>The higher education reform is looking to identify future skills requirements to satisfy the labour market needs, particularly in the areas identified in the government's Vision 2015; these are tourism, financial services, communication and information technology, education, health, manufacturing, value added services and jobs associated with promoting Malta's sister island Gozo as an ecological island. The challenge is to balance the need for new specialisations with the provision of generic skills.</li> </ul>
Availability of R&I Infrastructures	<ul style="list-style-type: none"> <li>Significant investments in infrastructures, through, for example, new and upgraded facilities at the university (in ICT, engineering, biotech) and improved business incubation facilities, will serve to increase absorptive capacity for R&amp;D whilst also improving Malta's potential to participate in EU-level collaborative projects attracting more research to Malta.</li> <li>A significant portion of investments is tied to structural funds over the period 2007-2013.</li> </ul>
Limited culture for entrepreneurship and innovation	<ul style="list-style-type: none"> <li>The policy mix has evolved to encompass instruments that provide direct access to finance for research and innovation with a focus on SMEs that exhibit limited innovative activity;</li> </ul>
A stringent business environment	<ul style="list-style-type: none"> <li>Reducing administrative burdens for business operations by 15% in 2012 through simplification processes.</li> <li>Consultations on the adoption of the Small Business Act.</li> </ul>
Implementation of R&I policies and measures	<ul style="list-style-type: none"> <li>A risk lies in achieving the Lisbon target time delays with implementing policies and measures.</li> </ul>

## 4 Contributions of national policies to the European Research Area

ERAWATCH country reports 2008 provide a succinct and concise analysis of the ERA dimension in the national R&D system of the country. This Chapter further develops this analysis and provides a more thorough discussion of the national contributions to the realisation of the European Research Area (ERA). An important background policy document for the definition of ERA policies is the Green paper on ERA<sup>38</sup> which comprises six policy dimensions, the so-called six pillars of ERA. Based on the Green Paper and complementing other ongoing studies and activities, this chapter investigates the main national policy activities contributing to the following four dimensions/pillars of ERA:

- Developing a European labour market for researchers facilitating mobility and promoting researcher careers
- Building world-class infrastructures accessible to research teams from across Europe and the world
- Modernising research organisations, in particular universities, with the aim to promote scientific excellence and effective knowledge sharing

<sup>38</sup> Commission of the European Communities: Green paper: The European Research Area: New perspectives. Brussels 4.4.2007, COM(2007) 161final (see [http://ec.europa.eu/research/era/pdf/era\\_gp\\_final\\_en.pdf](http://ec.europa.eu/research/era/pdf/era_gp_final_en.pdf)).

- Opening up and co-ordination of national research programmes

In the ERA dimension, the *wider context of internationalization of R&D policies* is also an issue related to all ERA policy pillars and is normally present in the dynamics of national ERA-relevant policies in many countries.

#### **4.1 Towards a European labour market for researchers**

The number of students graduating in maths, science and technology (S&T) from the university of Malta has more than doubled over the last eight years from 700 in 2000 to 1,500 in 2008. It has experienced a rapid growth rate compared to the EU-27 countries mainly thanks to an increase in computing and ICT related studies<sup>39</sup>; however it still remains below the EU average<sup>40</sup>. In 2008, the largest proportion of enrolments in Bachelors, Masters and Doctoral programmes in Malta was in the field of social science, business & law which accounted for 37% of all students enrolled at these levels. Students in science-related fields (e.g. engineering, life sciences) accounted for 16% of the total student population.

The tertiary education sector is the principal provider of researcher positions (university and its institutes and MCAST). The university usually engages individuals at assistant lecturer (Masters degree) or lecturer (PhD) levels on a permanent basis. These posts are quite competitive, and selection procedures may tend to favour individuals holding a PhD. Such positions carry with them other duties besides research, namely teaching as well as administrative responsibilities. Doctoral researchers are often engaged on project-based work whilst completing their research and may benefit from teaching assistantship positions.

Table 10 below shows that the salaries of university researchers are higher than those for similar permanent positions within government but are much lower than what the business sector offers.

The recent revision of the collective agreement for university staff may serve to attract further researcher careers because of the improved salary structure though it has introduced more ambitious targets for career progression based on a quality assurance framework that takes into account research output, the number of courses taught, course content, students' feedback, new course development and teaching effectiveness among other factors.

Opportunities for employment with the private sector arise mainly with the larger (manufacturing) firms that engage science and engineering graduates in R&D, quality control and eventually offer prospects for career progression in senior management positions. The higher salary package usually comes with longer working hours compared to those in the public sector and academia.

A 1997 tracer survey<sup>41</sup> of university graduates in the national labour market showed that graduates in computer science (44%), business studies (39%) and medicine sciences (43%) exhibited an above average employment rate whilst those with degrees in humanities, biological sciences and languages had below average

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<sup>39</sup> National Commission for Higher Education (NCHE) 'Further & Higher Education Statistics 2008'

<sup>40</sup> European Innovation Scoreboard EIS 2008

<sup>41</sup> Baldacchino (1997) From Potential Graduates to Graduates with Potential: Dramatic Changes at the University of Malta and Reactions from Graduates and their Employers.



success in securing full-time permanent employment<sup>42</sup>. Post-graduates in engineering and technology also experienced a higher than average unemployment rate. Reduced public sector recruitment may affect graduate unemployment<sup>43</sup> but there are no studies that can confirm this.

**Table 10: A comparison of salary structures of researchers in the public and private sectors in Malta**

Job title	Sector of Employment	Starting Gross Salary per annum	Degree Requirements	Length of contract offered	Openness to nationals and/or non-nationals	Source
Gross Average Salary in Malta	Average national salary	€28,078 (2006)	-	-	-	European Commission Study <sup>44</sup> 2007 Table 8p47
Researcher	Business sector	€48,000 (base year 2006)	-	-	-	European Commission Study 2007 Figure S12.6 p170
Assistant Lecturer	University	€24,356 €26,091 <sup>+</sup>	Master's degree	permanent	Malta/EU/other countries	Times of Malta, 16 <sup>th</sup> January 2009
Lecturer	University	€27,497 €29,696 <sup>+</sup>	PhD	permanent	Malta/EU/other countries	Times of Malta, 16 <sup>th</sup> January 2009
Full Professor	University	€38,033 €42,598 <sup>+</sup>	PhD plus publications, teaching.	permanent	Malta/EU/other countries	Times of Malta, 16 <sup>th</sup> January 2009
Pharmacist	Public Sector (ministry)	€15,873 (2009)	Pharmacy degree	permanent	Malta/EU/other countries	DOI <sup>45</sup> , 2009
Commission Officer/Analyst	Public Sector public agency	€17,475 - €23,300*	First degree in business, management or law	3 years	Not specified	DOI, 2009

\*depends on qualifications and experience

<sup>+</sup> values in italics refer to the revised salaries that came into effect as of 2009 following the new collective agreement for University staff

A study on researchers' salaries, undertaken for the European Commission<sup>46</sup> in 2006-2007, shows that the average annual gross salary of a Maltese researcher<sup>47</sup>

<sup>42</sup> National Commission for the Promotion of Equality NCPE (2006) Career Paths and Conditions of Work of Graduates in the Labour Market p79

<sup>43</sup> National Commission for the Promotion of Equality NCPE (2006) Career Paths and Conditions of Work of Graduates in the Labour Market p8

<sup>44</sup> European Commission Research Directorate General (2007) Remuneration of Researchers in the Public and Private Sectors

<sup>45</sup> DOI Department of Information, Malta

<sup>46</sup> European Commission Research Directorate General (2007) Remuneration of Researchers in the Public and Private Sectors

<sup>47</sup> In this study a researcher is defined as an individual who devotes at least 50% of his/her time to carry out research activities", *ibid* p18

(€40,340 in PPS<sup>48</sup>) is slightly higher than the EU25 average of €40,126 and considered a medium remuneration level amongst the EU25 and associated countries. It is the second highest salary, after Cyprus, of the ten countries that joined the European Union in 2004.

#### 4.1.1 Policies for opening up the national labour market for researchers

##### Enhanced mobility of national researchers

Mobility of Maltese PhD students and post-doctoral fellows occurs through three routes:

- Formal non-targeted programmes: these are the scholarship schemes for PhDs that cover tuition fees and a subsistence grant for students to undertake a three-year PhD programme abroad (or in Malta).
- Informal programmes e.g. various departments at the university maintain mainly informal agreements with foreign universities for Maltese PhD students to undertake part of their research/research training in foreign labs. In 2008, seven undergraduate students, mainly in IT and Engineering, benefited from a short scientific visit to [CERN](#) (European Centre for Nuclear Research) to work on scientific projects; these internships will be available also in 2009<sup>49</sup>.
- Through EU programmes: Participation in [ERASMUS](#) has been steadily increasing with a higher trend towards inward mobility (325 incoming students in 2006) compared to outward mobility (125 outgoing students)<sup>50</sup>. Participation has been facilitated through the implementation of the [European Credit Transfer System](#) (ECTS) across undergraduate courses (except Medicine and Dentistry) in October 2003 as part of the Bologna process.

The above mechanisms serve to establish and widen research networks that also promote the inward mobility of foreign researchers.

The PhD programme at the university is conducted by supervised independent research on a full time (three-five years) and part time (four to eight years) basis, very much in line with the British post-graduate programme. The higher education sector offers an English-speaking environment to accommodate a growing population of foreign students that reached 6% of the total higher education population in 2005<sup>51</sup>. The university has also established a number of joint degrees with foreign universities where part of the programme is offered in Malta and part in the overseas university; these are normally at Master's degree level.

A new programme, to be implemented in 2009-2011, is targeting the two-way mobility of post-doctoral researchers with the objective of amplifying the university's teaching and research capacity. The €3m programme will award, via competitive calls, research fellowships to early stage researchers employed with the university of Malta to train in a foreign institution; these will be contractually tied to return to Malta after the fellowship. Likewise researchers from abroad will be engaged on short-term

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<sup>48</sup> Remuneration values expressed as PPS (Purchasing Power Standard). These take into account differences in salaries due to cost of living, thus reducing differences among countries and highlighting the "attractiveness" in terms of remuneration of each country for the researcher, ibid p20.

<sup>49</sup> Malta Council for Science & Technology

<sup>50</sup> NCHE Further & Higher Education Statistics 2008

<sup>51</sup> NCHE Further and Higher Education Statistics 2008

contracts of two to three years to set up training programs in Malta in key areas including: biotechnology, marine biology, alternative energy, bioinformatics, marine software engineering, particle physics, entrepreneurship and technology transfer.

With regard to the mobility of Maltese academic staff, only senior researchers that have been working for at least 5 yrs at the university can take a sabbatical of one year and the approval for this is at the discretion of the Senate.

### **Attracting researchers from other EU Member States**

Vacancies for research posts within public higher education institutions and government entities are advertised, together with other job vacancies, in the national newspapers, the Malta government gazette and the government [department for information](#) website. They are equally open to both nationals and non-nationals and the submission of a job application is a fairly straightforward and transparent process. Applications are available online or retrievable from the entity's administration department; applicants are usually required to submit a *curriculum vitae*, three references and copies of professional qualifications and must undergo an interview process. Recruitment procedures in the private sector vary depending on the organisation's policy.

Malta has put in place a system for the accreditation and recognition of qualifications that falls under the responsibility of the Ministry for Education, Youth Sport & Culture. The [Malta Qualifications Recognition Information Centre](#) (MQRIC) awards recognition statements on comparability of qualifications for those degrees/qualifications awarded by foreign Universities/tertiary education institutions. This process of certification of foreign degrees is mandatory for both nationals and non-nationals applying for jobs with the public service and the higher education sector. The [Malta Qualifications Council](#)<sup>52</sup> certifies and accredits professional and vocational qualifications (other than degree qualifications<sup>53</sup>).

Researchers working within the university and the public sector benefit from the pension scheme offered to all public servants. University staff does benefit from a special health insurance package though there are no health insurance integration plans.

### **Third country researchers**

There is a legal framework under the Immigration Act<sup>54</sup> that provides for the [admittance of third country researchers](#) who have reached an agreement with a national research organisation to be engaged on a research project for a period of between one to five years. The researcher and his family are entitled to a residence permit and to benefit from sickness insurance, social security, tax benefits and a visa if required. Applications for entry of third-country nationals are assessed on a case-by-case basis by the [Director for Citizenship and Expatriate Affairs](#) in consultation with the Council for Science & Technology (MCST).

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<sup>52</sup> <http://www.mqc.gov.mt/>

<sup>53</sup> Ammerman A (2004): Achieving the Lisbon Goal: The Contribution of Vocational Education and Training Systems Malta Country Report. Accessed at: [http://www.refernet.org.uk/documents/Country\\_Report\\_Malta.pdf](http://www.refernet.org.uk/documents/Country_Report_Malta.pdf)

<sup>54</sup> Legal Notice 102 of 2008 Immigration Act Chap 217 Third country nationals for scientific research purposes

#### 4.1.2 Policies enhancing the attractiveness of research careers in Europe

This section looks at two aspects linked with enhancing the attractiveness of research careers: measures addressing researchers' salaries and those promoting the participation of women in research.

The [Charter for Researchers](#) and the [Code of Conduct for the Recruitment of Researchers](#) were endorsed by the Office of the Prime Minister and the Ministry for Competitiveness & Communications in 2005. A concern relates to the practical implications to implement the charter such as the additional financial costs needed to involve foreign experts on recruitment panels<sup>55</sup>.

##### Remuneration policies for researchers

Although the salary structure of researchers in Malta lies only slightly above the average for the EU-27 Member States, Malta has the potential to attract foreign researchers interested in undertaking research in niche areas such as whole of population studies in molecular biology/biotechnology and marine biology.

The new collective agreement for academic staff at the university will also serve to boost the status of researchers in Malta as it promotes research among the staff and places research output as one of the criteria for career progression. This agreement has seen an increase in the gross salary of senior academics for example a professor may earn an extra €16,000 by 2013 and a salary of around €48,000. However the agreement also requires academic staff to work longer hours and there is greater emphasis on quality assurance in education and research (benchmarked against publications, student contact hours etc.).

Part of the agreement stipulates the setting up of an intellectual property (IP) office; however IP rights which previously belonged to the researcher are no longer copyrighted to the individual; they will belong to the University and the researcher will be entitled to 50% of net profits derived from commercial exploitation<sup>56</sup>.

Career progression from assistant lecturer to lecturer scale requires the individual to obtain a PhD within the first seven years of employment; this may serve as an incentive for academics to further their research prospects. Short-term contracts for researchers may also be offered and are often tied to a particular project (e.g. a European project) in which case the remuneration may vary: it is either fixed in the service contract or determined on an hourly basis at university rates<sup>57</sup> or rates allowed by the project budget.

##### Promotion of women

The female population at the university of Malta has increased over the years and outnumbered that of males with 57% of the total student population being female in 2005-2006<sup>58</sup>. There are an increased number of females taking up science at

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<sup>55</sup> Office of the Prime Minister (2005) 'Memorandum on a Commission Recommendation on the European Charter for Researchers & the code of Conduct for the Recruitment of Researchers

<sup>56</sup> Times of Malta 'Academics set to earn up to €16,000 more' 23<sup>rd</sup> January 2009

<sup>57</sup> An *indicative* daily rate offered by the university for lecturers is of €135/dy and for assistant lecturers €122/dy. The rates vary depending on the nature of the specific work contract.

<sup>58</sup> Compared to the academic year 1994/1995, where 48.2% of the university population was female. Source: 'Malta National Report for Strategies on Social Protection and Social Inclusion 2008-2010' p15

university<sup>59</sup> with the result that more women are graduating with science degrees. The proportion of females graduating with a PhD (38% in 2003) remains well below that for males<sup>60</sup>. Traditionally, female PhDs are in education and the arts<sup>61</sup> whilst the engineering sciences remain a male-dominated faculty.

Despite this, female participation in the labour market is low. In the case of graduate females, these tend to leave paid work at a higher rate than male counterparts either for a career break or complete abandonment, generally due to family commitments<sup>62</sup>. Another contributing factor may be the lack of well-developed family support services such as childcare. The latter issue was addressed in the first structural funds programming period 2004-2006 through training of childcare assistants, tax deduction incentives on use of childcare services etc<sup>63</sup>.

Trends in the researcher labour market indicate that the higher education sector and government tend to have lower proportions of female researchers compared to male researchers (24% and 22% respectively in 2003) with specialisations in the social sciences and humanities<sup>64</sup>. No data are available for the private sector. Just over 20% of employees in top management in Malta are female<sup>65</sup>. With regard to remuneration, the gender pay gap is amongst the lowest in the EU-27 (>15%)<sup>66</sup>.

The conditions of work tend to promote equal opportunities for males and females, at least on paper. The public service agreement encourages "further participation of female employees, in particular in the professional, vocational and managerial grades"<sup>67</sup>. The revised collective agreement for public servants, effective as of January 2005<sup>68</sup>, introduced more flexible measures for parental leave (three to five years unpaid leave for care of children under six years of age) that may be shared by both parents as well as the possibility for reduced hours of work and flexitime until the children reach twelve years of age<sup>69</sup>. The 2008 Budget increased paid maternity leave by an extra week to 14 weeks. Also, in 2007, the government introduced a new measure that accredits social security contributions of the parents for the first two years of parental leave<sup>70</sup>.

Academics, whether male or female, are granted one year unpaid parental leave<sup>71</sup>. Only recently have work and family reconciliation policies such as parental leave and career breaks been introduced in the private sector where individuals are entitled to a

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<sup>59</sup> Overall, within the Faculty of Science, the number of females and males is balanced (170 females; 177 males) while in the Bachelor of Science (Hons) course, females outnumber males. Source: National Commission for the Promotion of Equality NCPE (2006) Career Paths and Conditions of Work of Graduates in the Labour Market

<sup>60</sup> European Commission 'She Figures 2006' p21

<sup>61</sup> National Commission for the Promotion of Equality NCPE (2006) Career Paths and Conditions of Work of Graduates in the Labour Market p3

<sup>62</sup> National Commission for the Promotion of Equality NCPE (2006) Career Paths and Conditions of Work of Graduates in the Labour Market

<sup>63</sup> Malta's National Reform Programme 2005-2008 Closure Report in NRP 2008-2010 pp16, 35, 38

<sup>64</sup> European Commission 'She Figures 2006' p42

<sup>65</sup> Malta Employment Training Corporation (2007) 'Gender Equality Action Plan 2007-2008' p24

<sup>66</sup> European Commission (2007) Remuneration of Researchers in the Private and Public Sectors

<sup>67</sup> Office of the Prime Minister (2005) 'Collective Agreement for Employees in the Public Service 2005-2010' p5

<sup>68</sup> Office of the Prime Minister (2005) 'Collective Agreement for Employees in the Public Service 2005-2010'

<sup>69</sup> Office of the Prime Minister (2008) 'Public Service Management Code' Article 3.1.6.2.(a)

<sup>70</sup> Malta Employment Training Corporation (2007) 'Women at work: Findings from a study on the work aspirations of Maltese Women p39

<sup>71</sup> University of Malta (2002) Agreement on the Academic Staff of the University of Malta hard copy only

minimum period of three months unpaid parental leave; however the exact conditions may vary between firms<sup>72</sup>.

In both the public and private sectors, the individual should be guaranteed, by law, to return to the same *type* of work or *equivalent* after a career break<sup>73</sup>. Thus whilst the law does not penalize career breaks and favours re-integration into the workplace, it does not guarantee *de facto* that the individual returns to his/her exact responsibilities/duties. However a study on graduate women points at the fact that career breaks may impinge negatively on women's careers (such as reducing the chances of promotion)<sup>74</sup>.

## 4.2 Governing research infrastructures

Malta's policy vis-à-vis research infrastructures (RIs) is guided by the National Strategy R&I Plan that emphasizes the need to establish research capacity in the designated platforms of strategic importance, and to design a roadmap for research infrastructures that takes into account European cooperation and is integrated within the [European Roadmap for Research Infrastructures](#)<sup>75</sup>. Malta is in a phase of strengthening its national infrastructures in focus areas (Energy-Environment, ICT, Health-Biotech and High value-added Manufacturing) in order to be better placed to participate in transnational infrastructural projects.

In 2008 a memorandum of understanding was signed with CERN (European Centre for Nuclear Research) as a first step towards establishing more formal links with the centre. There is also an interest to join the [European Molecular Biology Laboratory](#) (EMBL). The current investments relate to the involvement of national organisations as partners in European-led initiatives; though in this case most of the funding is provided by the European Union (e.g. through RI projects of the Framework Programme for Research, FP). In the financial estimates for 2009, no specific funds have been committed for RIs.

Table 11 below gives a snapshot of Malta's participation in RI initiatives. This is by no means an exhaustive list though it gives an idea of the areas of current involvement and activity and shows that the university is particularly active in participating in European-led projects.

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<sup>72</sup> Malta Employment Training Corporation (2007) 'Women at work: Findings from a study on the work aspirations of Maltese Women p27

<sup>73</sup> The Employment & Industrial Relations Act of 2002 that governs the provisions for private and public sector employment stipulates, in Article 19 (p23 of the Act), that women who take career breaks (for parental leave) be entitled to resume the post occupied upon commencement of maternity leave or an analogous post.

<sup>74</sup> Camilleri-Cassar F (2005) quoted in 'ETC (2007) Women at Work'

<sup>75</sup> National Strategic R&I Plan Recommendation No. 29 and 30 pp72-73

**Table 11: Examples of Malta's participation in Research Infrastructures (non-exhaustive list)**

Research Infrastructure	Focus Area	Sponsored by	Principal national partner organisation
<a href="#">LifeWatch Biodiversity</a>	Biodiversity	EU-FP6	University of Malta – <a href="#">Department of Biology</a>
<a href="#">SEADATANET</a>	Ocean and marine data management		University of Malta – <a href="#">Physical Oceanography Unit</a>
GOOS ( <a href="#">Global Ocean Observing System</a> )	Operational oceanography	IOC <sup>76</sup> , UNEP <sup>77</sup>	University of Malta – Physical Oceanography Unit/ <a href="#">Malta International Oceanographic Institute (IOI) Centre</a>
GEANT ( <a href="#">Gigabit Pan-European Research and Education Network</a> ) and EUMEDGRID	High speed network connectivity for research	EU-FP6	University of Malta – Computing Services Centre and Department of Computer Science & Artificial Intelligence
<a href="#">Ithanet</a>	Thalassemia electronic infrastructure	EU-FP6	University of Malta – Molecular Biology Laboratory
<a href="#">Eurocean</a>	Marine research and technology	foundation	Malta Council for Science & Technology

### 4.3 Research organisations

The reform of the Further and Higher Education sector was the focus of a two-year consultation exercise (2007-2009) championed by the Commission for Higher Education (NCHE) that has identified the priorities for sector-wide reforms; namely the need for reforms in licensing of institutions, the putting in place of an accreditation framework for institutions and their programmes, the revision of the governing structure of state funded institutions and a call to review the funding framework within which state institutions operate<sup>78</sup>.

This section focuses on the university and its reform, a key aspect addressed by the consultation exercise mentioned above. Amongst the main issues being tackled are the need to promote more research, innovation and creativity at the university and the importance of channelling resources to address national economic and social needs. The new collective agreement for academic staff at the university is part of this process (see [Section 4.1.2](#) above). There is also more emphasis on quality assurance in research where academic staff salaries and promotions are going to be benchmarked against performance (measured in terms of publications, student evaluation, teaching load).

The university enjoys relative autonomy from the ministry of Education, Youth, Sport & Culture (MEDC) in terms of setting and managing its research agenda. A research funding committee, appointed by the university council, assesses and approves project proposals and feasibility plans that it receives from the various departments and research units.

The research funding committee is guided by the National Strategic R&I Plan in terms of prioritization of areas for research; these areas were identified in 2006 when

<sup>76</sup> IOC: International Oceanographic Commission

<sup>77</sup> UNEP: United Nations Environment Programme

<sup>78</sup> Department of Information 'A Quality Assurance Framework for Further & Higher Education in Malta' Press Release 11<sup>th</sup> January 2008

the plan was being drafted in close consultation with the university. However, it retains flexibility to fund other areas of interest not mentioned in the strategy.

In terms of funding, the university relies heavily on the government from which it receives a block grant through MEDC. Apart from sustaining the university's running costs, the government also provides the students with maintenance grants (€21m in 2009<sup>79</sup>). Over the period 2005-2009, public funding for the university increased by 37% to keep pace with increasing student populations. In 2009, an additional €1.5m has been allocated for investment in research, see Table 12 below. The second programming period of structural funds (2007-2013) has served to give a significant boost in terms of infrastructural investments.

**Table 12: National funds allocated to the University of Malta over the period 2006-2009 (figures exclude structural funding contributions)**

Description	2005	2006	2007	2008	2009
<b>Recurrent expenditure</b>	€24.7m actual	€24.84m actual	€27.49 actual	30.05 approved estimate	€33.00 estimate
<b>Capital Expenditure</b>	€1.5m actual	€1.5m actual	€0.37m actual	€3.14m approved estimate	€3.07m estimate
<b>Total</b>	€26.20m	€26.34m	€27.86m	€33.19m	€36.07m

Source: Ministry of Finance<sup>80</sup> Budgetary Estimates 2006-2009

Generally, although proposals for projects undertaken by the university departments are drawn out for three years, the university only grants annual budgets for research projects as it relies on block funding that it receives from MEDC on an annual basis. This represents a handicap when embarking on long-term projects as it introduces a high level of uncertainty on their continuity.

Thus an emerging priority sees the need for the university to gain more autonomy from the budgetary cycles approved on an annual basis by the parliament and shift towards operating a multi-annual budget (of at least four years) that would increase its financial autonomy<sup>81</sup>. In one way, the allocation of resources through the structural funding programme is helping to achieve this shift, with projects running for three to five years; however most of these are infrastructural in nature and not research-based projects.

The university has been successful in tapping alternative sources of funds through the EU's Framework Programme for Research (FP) and the National R&I funding Programme (where it implements collaborative projects with industry). Through the latter programme university departments were able to hire through external calls, research personnel, typically students undertaking post-graduate programmes, to work on fixed term contracts on the projects.

In terms of governance, the university adopts mainly a top-down approach. The council, which is the governing body of the university, is composed principally of deans of the various faculties, as well as representatives of the university student

<sup>79</sup> Times of Malta 'Education Ministry defends grants despite critical report by Brussels' 19<sup>th</sup> February 2009

<sup>80</sup> Malta Ministry of Finance, Economy & Investment <http://finance.gov.mt/default.aspx>

<sup>81</sup> Bartolo E – Labour MP for Education 'Creating a Better University' in Times of Malta 28<sup>th</sup> January 2009



bodies. It also encompasses members from industry and public service “to represent the general interest of the country”<sup>82</sup>.

#### **4.4 Opening up national research programmes**

The current design of the [national Research & Innovation Funding Programme](#) does not promote opening up and co-ordination with other research programmes in the sense that the funding is limited to Maltese entities and non-national entities can participate only as non-beneficiary partners and they cannot act as project co-ordinators. Moreover, the research grants awarded for the projects via competitive calls must remain with the local entity and cannot be transferred if the researcher working on the project moves to another position outside the country. One of the concerns with joint programming is the extent to which Maltese entities could benefit in terms of funding from such programs.

By drawing on one of the recommendations of the National Strategic R&I Plan, the NRP 2008-2010 does commit Malta to participate “in a joint call in one of the identified national priority research areas where there is an indication of significant take-up at national level”<sup>83</sup>. It is envisaged that this participation will be facilitated through [ERA-NET](#) and ERA-NET Plus schemes and will require a re-evaluation of the National Funding Programme to facilitate such participation. Some experience has been acquired through participating in a pilot joint research action; specifically in 2004, the Council for Science & Technology (MCST) participated in a pilot joint horizon scan initiative with representatives from Denmark, the UK and The Netherlands. This was part of the [Forsociety](#) ERA-NET that looked at developing shared visions on the future in order to support common policies and joint research programming; there was no committal of funds for the pilot.

Although the NRP does not specify this, the areas of interest could include potentially the platforms of strategic importance (energy-environment, health-biotech, ICT and high value-added manufacturing) that are identified in the National R&I Plan as representing areas of economic importance.

There is also the commitment and impetus for Malta to participate in the Eurostars joint research initiative for research-performing SMEs. Malta Enterprise has a dedicated budget for Eurostars participation and is prepared to offer support for Maltese SMEs to gain maximum benefit from this programme.

#### **4.5 National ERA-related policies - a summary**

Policies supporting a labour market for researchers are being given prominence. Efforts are targeted at boosting the number of early stage career researcher with PhDs and promoting outward mobility in order to strengthen the skills base. The reform of the higher education sector is also attempting to boost the status of the researcher as a profession; the working conditions of academic researchers are foreseen to improve following the recently revised collective agreement for academic staff at the university and they are attempting to foster a research environment. These initiatives are part of a broader strategy for the university to make a tangible

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<sup>82</sup> University of Malta webpage accessed at: <http://www.um.edu.mt/about/uom/administration/council> on 22nd February 2009

<sup>83</sup> National Reform Programme 2008-2010 p62-p63

transition from a teaching to a research institution; though additional efforts are required to ensure more financial autonomy and flexibility.

There are no concrete policy measures aimed at opening up of research programmes; even though the NRP 2008-2010 foresees participation in a joint European activity. As it stands, the National R&I Funding Programme is inward looking in terms of funding modes and international participation. The main uncertainty in this ERA dimension lies in how much Malta would reap benefit from participating in joint programming initiatives.

Perhaps the emphasis on strengthening research infrastructures, mainly in the higher education sector, is seen as being strategic in enabling Malta to participate more actively at European level in large-scale collaborative projects. As it stands, although Malta's participation in European projects (such as those of the Framework Programme for Research) is positive, it is much less satisfactory with regard to larger-scale collaborative participation such as networks of excellence and integrated projects. This is where Malta needs to build 'research excellence', by strengthening its infrastructural base, in order to be in a better position to compete for larger-scale funding initiatives.

**Table 13: Importance of the ERA pillars in the ERA policy mix and key characteristics**

	<b>Short assessment of its importance in the ERA policy mix</b>	<b>Key characteristics of policies</b>
Labour market for researchers	<ul style="list-style-type: none"> <li>This has been a priority in the national policy mix in recent years. Efforts have been targeted at boosting the number of early stage career researcher with PhDs and promoting mobility.</li> </ul>	<ul style="list-style-type: none"> <li>Boosting PhDs through scholarship schemes;</li> <li>Legislation for inward third country researcher mobility;</li> <li>New fellowship scheme for two-way mobility of post-doctoral researchers;</li> </ul> <p>The new collective agreement for academic staff at the university aims to make researcher careers more attractive.</p>
Governance of research infrastructures	<ul style="list-style-type: none"> <li>There is no specific commitment at policy level in terms of funding and providing adequate structures to participate in European infrastructural projects.</li> </ul>	<ul style="list-style-type: none"> <li>The current effort is to strengthen infrastructures, mainly in higher education institutions, in strategic areas (NRP Measure 3.0).</li> </ul>
Autonomy of research institutions	<ul style="list-style-type: none"> <li>The emphasis has been on the university reform, specifically to make a tangible transition from a teaching to a research university; though additional efforts are required to ensure more financial autonomy and flexibility.</li> </ul>	<ul style="list-style-type: none"> <li>The recent reform is introducing a quality assurance framework for promotion of academic staff that is being benchmarked against research and teaching outputs.</li> </ul>
Opening up of national research programmes	<ul style="list-style-type: none"> <li>This has been prioritized in the NRP 2008-2010, where Malta is expected to participate in a joint programme by 2010. However the national R&amp;I Funding programme must be re-designed in order to enable such joint programming. As it stands, the programme is inward looking in terms of funding modes and international participation.</li> <li>A related concern is the brain drain of researchers that is already apparent.</li> </ul>	<ul style="list-style-type: none"> <li>The only ERA-related dimension of the national programme is the international peer review of projects.</li> </ul>

## 5 Conclusions and open questions

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### 5.1 Policy mix towards national R&D investment goals

Malta faces a number of challenges related to its small size and insularity such as the difficulty to exploit the advantages of economies of scale, the prevalence of an export-oriented market, a limited human resource base and limited scope for specialisation (Briguglio, 1995). These scale-dependent factors lead to significant dependencies on technology transfer from larger countries as well as on foreign direct investment, making the country more vulnerable to external “shocks” (such as fluctuations in oil prices and increased international competitive pressures<sup>84</sup>).

In order to counter such external shocks and more generally face up to globalization challenges, macro-economic policies are promoting flexibility in the labour market, sustaining the competitiveness of traditional (manufacturing) sectors and investing in diversified sectors, including knowledge-based activities, that offer a higher return and more employment opportunities<sup>85</sup>. The six sectors outlined in the government's Vision 2015 are information, communication technologies, financial services, tourism service, high value-added industry and services, international educational services and health services. However these sectors rely on a skilled workforce and an adequate research and innovation infrastructure supporting their growth.

The national R&I framework is being shaped by this particular economic backdrop. The progress in achieving national R&D investment targets can be considered positive in terms of the policy response, with a wider mix of demand-side and supply-side policies and measures being implemented and that draw from the recommendations of the National Strategic R&I Plan. The measures include the dedication of a substantial portion of structural funds for research infrastructures, the introduction of new scholarship schemes, funding for collaborative research through the platforms of strategic importance (e.g. in manufacturing) and an initiative to draw out an action plan for R&I public procurement. The key issue is that of dovetailing policies and strategies in order to move from implementing individual measures towards addressing system-level needs.

Macro-level policies aim to increase attractiveness of the business environment; this will also serve to spur business R&D. Thus, Malta is embracing the European Commission's proposal for the setting up of a Small Business Act<sup>86</sup> in order to reduce administrative burdens for business operations by 15% in 2012<sup>87</sup>. Investments in building a skilled human resource base in science and technology have a direct impact on increasing employment (for example in emerging high tech sectors) and contribute to employment targets of the NRP.

With regard to boosting business sector R&D, the policy mix has seen an evolution in the type of instruments, target groups and sectors though structural barriers and policy gaps persist and restrain R&I growth in this sector. The new schemes for enterprise consist of dedicated instruments to promote research and industrial

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<sup>84</sup> Malta's National Reform Programme 2008-2010 p49.

<sup>85</sup> Malta's National Reform Programme 2008-2010 p48-51.

<sup>86</sup> Prime Minister's Budget Speech 2009

<sup>87</sup> COMM (2008): 'Implementation of the Lisbon Strategy Structural Reforms in the context of the European Economic Recovery Plan: Annual country assessments – a detailed overview of progress made with the implementation of the Lisbon Strategy reforms in Member States in 2008' 28<sup>th</sup> January 2009

development, innovation among low-performing SMEs and opportunities for collaborative projects (through the Eureka and Eurostars participation). Another gap remains the lack of a venture capital (VC) fund; despite a number of attempts to introduce venture capital, this never took off.

Slower momentum is recorded in terms of reaching investment targets. Investments are skewed towards route 6 (increasing R&D in the public sector); whilst route 5 (public-private collaborative R&D) is under-represented. Aid schemes for enterprise mainly address routes 1 and 2 of the policy mix. The system still lacks multiannual programmes.

Another barrier lies in the bureaucratic delays arising when accessing and deploying national and EU funds implementing schemes. For example, grant scheme for industrial R&D has suffered such delays and will only be launched by Malta Enterprise in 2009.

Research and innovation are seen to act as significant enablers of the knowledge-based economy in the high-growth sectors mentioned above. However, this would require a wider R&I policy mix and more effective coordination amongst policies (compared with the current situation that seems to be favouring individual policy measures and initiatives). An example is the need for greater synergies between research and innovation policies (such as the support for research infrastructures) and education and training.

## 5.2 ERA-related policies

The scale-dependent factors that influence research and innovation policy – more specifically concerns over lack of critical mass, brain drain, dependency on Foreign Direct Investment (FDI) - raise particular policy challenges that may influence engagement with the European Research Area (ERA).

Small country innovation policy tends to be more 'internationally oriented' (Davenport and Bibby, 1999) where international collaboration is likely to account for a much higher proportion of activity than in a large country. Whilst this offers advantages (in an ERA context) it may result in the country relying on 'importation of S&T' at the expense of investing in a national R&I strategy.

Moreover, the need to invest resources broadly across a number of areas to maintain broad coverage of science and technology may deter the ability to build technological competencies and establish networks of excellence nationally and link up with similar networks abroad.

Although the national R&I system has undergone rapid process of change in recent years, it is still in a maturation phase where the focus is on building capacity, in terms of infrastructures and human resources, in strategic areas in order to be better placed to participate in European research initiatives. Article 169<sup>88</sup> requires the deployment of resources for R&I and this process only started recently when resources were dedicated for R&I in the national R&I funding programme and more

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<sup>88</sup> Article 169 of the EC Treaty states that: "*in implementing the multiannual framework programme, the Community may make provision, in agreement with the Member States concerned, for participation in research and development programmes undertaken by several Member States, including participation in the structures created for the execution of those programmes.*" Source: [http://cordis.europa.eu/fp7/art169/about-169\\_en.html](http://cordis.europa.eu/fp7/art169/about-169_en.html)

recently in the second structural funds programming period 2007-2013 through a dedicated Knowledge & Innovation axis.

Another area of concern includes the brain drain of young professionals, including researchers, where Malta is already facing a brain drain and researchers are limited in number.

At a policy level, the ERA dimension is more explicitly embedded in Malta's second National Reform Programme 2008-2010 where it is Malta's intention to participate in a joint programming activity in an area where there is an indication of significant take-up at national level. For this to be possible, the national funding programme will need to be re-designed in order to cater for such joint programming activities.

There are initiatives geared at 'opening up' the system; these include legislation favouring inward mobility of third country researchers and external peer review of the national funding programme. The development of the Euro Mediterranean Initiative for Science & Technology (EuroMedITI) could provide for an interesting example of addressing some of the above gaps by generating sufficient critical mass for R&I and North-South technology transfer in the Euro-Med market.

The above raises concern over whether ERA-related policies are sufficiently differentiated to address the capacities, potential and needs of those Member States (MS), like Malta that are still in a catching up phase and that are faced with a particular set of challenges when trying to come at par with old MS. Specific points to address could include the appropriate design of funding programmes that address small country needs and the development of appropriate R&I indicators for more effective benchmarking of policies between large and small member states.

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## List of Abbreviations

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BERD	Business Expenditure on R&D
BTN	Business Technology Network
CERN	European Centre for Nuclear Research
COST	European Cooperation in Science & Technology
DOI	Department of Information
ECTS	European Credit Transfer System
EIS	European Innovation Scoreboard
EMBL	European Molecular Biology Laboratory
ERA	European Research Area
ERDF	European Regional Development Fund
ESF	European Social Fund
EU	European Union
FAO	Food and Agriculture Organisation
FDI	Foreign Direct Investment
FP	European Framework Programme for Research and Technology Development
GBOARD	Government Budgetary Appropriations or Outlays for Research & Development
GEANT	Gigabit Pan-European Research and Education Network
GERD	Gross Expenditure on Research & Development
GDP	Gross Domestic Product
GOOS	Global Ocean Observing System
HEI	Higher Education Institutions
HES	Higher Education Sector
ICT	Information Communication Technology
IOC	International Oceanographic Commission
IOI	International Oceanographic Institute
IPR	Intellectual Property Rights
IRC	Innovation Relay Centre
ME	Malta Enterprise
MEDC	Ministry for Education, Youth, Culture & Sport
MCAST	Malta College for Arts, Science & Technology
MCST	Malta Council for Science & Technology
MQRIC	Malta Qualifications Recognition Information Centre
MS	Member State(s)
NCHE	National Commission for Higher Education
NRP	National Reform Programme
NSO	National Statistics Office
OPM	Office of Prime Minister
PPCD	Planning & Priorities Co-ordination Division
PPS	Purchasing Power Standard

R&D	Research and development
RI	Research Infrastructures
RTDI	Research Technological Development and Innovation
SF	Structural Funds
S&T	Science and Technology
SMEs	Small and medium sized enterprises
STEPS	Strategic Educational Pathways Scholarships
UNCTAD	United Nations Conference on Trade & Development
UNEP	United Nations Environment Programme
VC	Venture Capital

European Commission

**EUR 23976 EN/11**

**Joint Research Centre – Institute for Prospective Technological Studies  
Directorate General Research**

Title: ERAWATCH Country Reports 2009: Analysis of policy mixes to foster R&D investment and to contribute to the ERA: Malta

Authors: Lisa Pace

Luxembourg: Office for Official Publications of the European Communities  
2009

EUR – Scientific and Technical Research series – ISSN 1018-5593

ISBN 978-92-79-13317-6

DOI 10.2791/19905

### **Abstract**

The main objective of the ERAWATCH Policy Mix Country reports 2009 is to characterise and assess in a structured manner the evolution of the national policy mixes in the perspective of the Lisbon goals, with a particular focus on the national R&D investments targets and on the realisation and better governance of the European Research Area. The reports were produced for all EU Member State and six Associated States to support the mutual learning process and the monitoring of Member and Associated States' efforts by DG-RTD in the context of the Lisbon Strategy and the European Research Area. The country reports 2009 build and extend on the analysis provided by analytical country reports 2008 and on a synthesis of information from the ERAWATCH Research Inventory and other important available information sources.

This report encompasses an analysis of the research system and policies in Malta.

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