An evidence-based approach to optimising Malta's research funding systems

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Abstract

This dissertation investigates the optimisation of Malta's research funding systems, focusing on challenges and opportunities for enhancing the effectiveness of funding mechanisms. Malta, as a small EU member state, faces unique hurdles, including heavy reliance on EU funding, administrative burdens, and limited national research resources. Through qualitative in-depth interviews with key stakeholders, this research identifies critical barriers to research funding such as administrative inefficiencies, lack of stable funding, and insufficient collaboration between academia and industry. The study highlights how these factors limit researchers' capacity to pursue long-term, impactful projects and align research efforts with national priorities.

The findings reveal that Malta's over-dependence on EU grants forces local researchers to align with EU priorities, often at the expense of addressing Malta-specific needs. Additionally, the current funding landscape, characterised by short-term grants, disrupts project continuity and deters researchers from engaging in ambitious initiatives. The research emphasises the need for a centralised national research fund with more flexible, sustainable funding mechanisms to support long-term projects and encourage industry-academia collaboration.

The study also underscores the importance of reducing administrative burdens, particularly for early-career researchers and smaller institutions, by streamlining application processes and introducing tiered reporting requirements. Enhancing capacity-building initiatives, establishing dedicated support structures, and fostering stronger industry partnerships are recommended to drive innovation and economic growth.

Overall, the research provides actionable recommendations for optimising Malta's research funding system, suggesting that strategic policy changes, collaborative efforts, and

investments in sustainable funding models can strengthen the nation's research ecosystem. By addressing these challenges, Malta can better leverage its research potential to achieve socio-economic growth, positioning itself as a competitive player in the EU research landscape.

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Introduction

Research funding is a cornerstone of national and global innovation, serving as a primary driver for scientific progress and societal advancement. Governments and international organisations invest significant resources in research initiatives, recognising their potential to tackle critical challenges and stimulate economic growth. However, the impact of research funding extends beyond the mere provision of financial resources; it hinges on the efficacy of both its allocation and utilisation (Geiger, 2004). Effective research funding not only supports the exploration of new ideas and technological breakthroughs but also plays a crucial role in addressing pressing global issues. Moreover, the efficient management of these funds, alongside robust administrative and support structures, is essential for maximising their potential benefits. By promoting collaboration, facilitating knowledge sharing, and ensuring long-term sustainability, research funding can significantly enhance scientific innovation and contribute to the broader advancement of society (Yarime et al., 2012). Thus, understanding the dynamics of research funding mechanisms and their impact is vital for fostering a thriving research ecosystem and achieving meaningful progress.

Scope of the study

This study delves into the intricacies of the local research funding landscape in Malta, with a focus on understanding the processes, experiences, lessons learned, and the genuine impact on society. As a “widening country” within European funding schemes, Malta faces both opportunities and challenges. This designation acknowledges that Malta, along with other smaller EU member states, may have less developed research infrastructure and capacities when compared to larger nations (Cotton et al., 2013). While European funding frameworks offer opportunities for these countries to enhance their research capabilities and competitiveness, securing funding can be highly competitive. Smaller nations like Malta often struggle to position themselves as leading partners in large, high-impact projects, which

are typically dominated by more established research institutions. This is echoed by Malta's limited participation in European Partnerships in 2024, with the country involved in only four such partnerships, none of which it coordinates (European Commission, 2024).

One of the key challenges Malta faces is the limited availability of advanced technologies and research infrastructure. As a small island state, Malta does not have the same level of investment in specialised facilities as other EU countries. This can deter local researchers from participating in ambitious, large-scale projects, where success often requires cutting-edge expertise and equipment. The perceived barriers to success, compounded by resource constraints such as limited human capital and funding, may make Maltese researchers cautious about engaging in competitive calls for proposals.

Aims and Objectives

Based on professional observations within the research sector, there appears to be a reluctance among Maltese researchers to engage in large, international research collaborations. Various constraints, including limited access to expertise, insufficient research infrastructure, and the complexities associated with managing large projects, may drive this hesitation. Additionally, a lack of successful research collaboration stories in Malta contributes to the uncertainty surrounding the potential benefits of these initiatives. One of the most cited success stories is FLASC, a spin-out company from the University of Malta that was initially supported by grants from Xjenza Malta (formerly MCST) (Malta Independent, 2024). However, FLASC was strategically established in the Netherlands to scale up, highlighting the challenges Malta faces in retaining innovative ventures (University of Malta, 2020c). This limited track record underscores the need for more locally retained success stories to encourage wider participation in international collaborations.

With such an outlook as a baseline, this study will be adopting a qualitative approach, utilising in-depth interviews, to identify the key thematic, procedural, and implementation issues that have influenced the successes and pitfalls of research projects. Thus, the main aim of this study is to explore how local research funding processes and outcomes can be optimised through evidence-based decision-making.

The Maltese government and the European Union recognise the crucial role that research funding plays in fostering structural, cultural, and technological advancement. In the Horizon 2020 program, the EU allocated nearly €80 billion for research grants, yet Malta secured only €37.5 million of this funding (European Commission, 2020b). However, to improve the current state of affairs, robust policies, targets, and initiatives alone are not sufficient. For such efforts to be truly effective, they must be implemented through an efficient research funding system that genuinely understands and respects the practical, day-to-day work of researchers. Moreover, success hinges not only on funding, but also on researchers' commitment, readiness, and the availability of opportunities and support to carry out their work. In this regard, this study explores how support is extended to projects reaching higher Technology Readiness Levels (TRLs), enabling research to progress toward practical market implementation. The goal is to ensure that each research idea is developed to its fullest potential, maximising tangible outcomes and societal impact.

Operational issues such as human capacity and knowledge of project leaders, administrative reluctance and burden, and reporting issues are crucial factors that can significantly influence the success or failure of a project. Stress experienced by project leaders, administrative hurdles, and reporting requirements can hinder the progress of research projects and impede their successful completion (Shepherd et al., 2011). By shedding light on these issues, this study aims to contribute to the optimisation of local

research funding processes and outcomes in Malta. More specifically, the main objectives of this research are as follows:

- To identify the challenges and strengths encountered by researchers in securing funding.
- To uncover insights for enhancing future projects by understanding the issues elicited from project management experiences.
- To encourage greater research output and more successful research funding opportunities, thus aiming for greater societal benefits emanating from these projects.

Research Questions and Methodology

The study aims to answer the following research questions (RQs):

- RQ1: What obstacles/issues do researchers encounter when attempting to take up a research funding opportunity? What are the strengths associated with current research funding opportunities?
- RQ2: How can the identified obstacles be reduced and the research done be optimised, including the implementation aspect?

In order to answer research questions 1 and 2 above, a pragmatic epistemological framework encompassing both subjective and objective dimensions of investigation will be adopted (Kelly & Cordeiro, 2020).

For RQ1, the investigator intends to employ a subjective ontological approach, placing emphasis on exploring the intricate meanings and underlying themes associated with research and innovation (R&I) funding systems. These interviews with researchers aim to unveil nuanced insights by highlighting their unique perspectives and experiences. By delving into these subjective narratives, our objective is to pinpoint specific obstacles and challenges encountered during the pursuit of research funding opportunities. This approach

facilitates a profound and all-encompassing comprehension of the elaborate landscape that researchers navigate.

To address RQ2, researchers will be encouraged to propose areas where they believe improvements are necessary. Additionally, deductive reasoning will be applied to derive further suggestions based on recurrent responses and the investigator's expertise in the subject matter under discussion.

Data Collection and Analysis

The study is designed to delve into the hindrances within R&I funding systems and to explore avenues for optimisation. To achieve this, in-depth interviews will serve as the primary data collection method. These interviews will encompass a diverse spectrum of researchers, spanning various academic disciplines, career stages, and institutional affiliations. The formulation of a comprehensive interview guide will facilitate open and detailed discussions. Participant selection will be carried out through purposive sampling, concentrating on individuals actively engaged in research, innovation, and academia. Recruitment will be conducted through direct outreach and snowball sampling methods. The interview process will continue until data saturation is achieved, ensuring a comprehensive exploration of obstacles and improvement strategies.

To bolster the reliability and validity of the qualitative findings, the interview guide will incorporate 'think aloud' methods to assess its effectiveness and refine questions to align with the research questions (RQ1 and RQ2). Thorough transcription of interview data will be conducted, and member validation approaches will be employed to verify the accuracy of the analysis. Thematic analysis will be employed to systematically categorise and interpret the interview data.

Conclusion and Dissertation Overview

Through this study, the aim is to contribute to the optimisation of local research funding processes and outcomes in Malta. By addressing the identified challenges and leveraging the strengths of existing funding mechanisms, this research seeks to encourage greater research output, more successful funding opportunities, and, ultimately, greater societal benefits from research projects in Malta.

Building on this objective, the dissertation proceeds with a literature review that highlights the challenges in securing funding, particularly for small states like Malta, and underscores the benefits of evidence-based approaches. The methodology chapter follows, outlining the use of qualitative in-depth interviews to gather insights directly from researchers and stakeholders. Based on this data, the results section identifies key barriers such as administrative burdens, limited infrastructure, and insufficient collaboration, while also highlighting opportunities for improvement. The discussion contextualises these findings, offering practical recommendations to enhance Malta's research ecosystem and optimise funding mechanisms. Finally, the concluding chapter emphasises the need for strategic policy changes and collaborative efforts to ensure sustainable, long-term research growth and innovation in Malta.

Literature Review

This chapter will provide an overview of what is known in the literature about research funding systems, setting the scene for this study.

Overview

Over the years, policy fora within the European Union have set ambitious policies and targets to emphasise the important role of R&D in today's ever-evolving society. One significant milestone, in which Malta participated, was the Lisbon Strategy of 2000, where the EU aimed to dedicate 3% of GDP to research and development (R&D) by 2010 (European Commission, 2010c). Although this target was not fully met across all member states, and the EU in general, it highlighted the critical role of R&D in enhancing Europe's competitiveness, productivity, and innovation (European Commission, 2010c).

Building on this foundation, the Europe 2020 Strategy was introduced as a 10-year plan to promote smart, sustainable, and inclusive growth (European Commission, 2010a). Central to this strategy was boosting innovation as a key driver of economic development and job creation (European Commission, 2010a). Within this framework, the Innovation Union Flagship Initiative laid out a roadmap for removing barriers to innovation, streamlining access to research funding, and fostering collaboration between public and private sectors (European Commission, 2010b). The initiative also emphasised the need for better coordination between national and EU-level research policies to maximise the impact of R&D investments, particularly in addressing pressing societal challenges like climate change, health, and digital transformation (European Commission, 2010b).

Malta has actively aligned itself with these broader EU goals, benefiting from participation in various funding mechanisms and collaborative programs. The Horizon Europe program (2021–2027), for instance, continues these efforts, providing significant

resources to help Malta and other member states contribute to the EU's innovation objectives (European Commission, 2022). In this regard, Malta is making strides toward increasing its research capacity and technological advancement (Malta Council for Science and Technology, 2024b).

By adhering to the principles of the Europe 2020 Strategy and the Innovation Union Flagship, Malta has been working to foster sustainable and inclusive growth through strategic investments in research, innovation, and technology. This commitment is reflected in both national and EU-funded initiatives that aim to enhance Malta's research capabilities, drive technological progress, and create a more competitive, knowledge-based economy (Malta Council for Science and Technology, 2024b).

The optimisation of research funding systems has become an imperative in today's dynamic and competitive knowledge economy. Whilst an abundance of funding systems seems to be constantly available, issues undoubtedly still remain. In numerous countries, the prevailing circumstances are characterised by constrained interpretations of what qualifies as 'scientific' research, funding prerequisites that impose rigid research methodologies, and policy formulation procedures that disregard any research not strictly tied to utilitarian objectives (Smeyers & Depaepe, 2018). This overarching context serves as a disincentive to the pursuit of scholarly endeavours that exhibit a more speculative, exploratory, or critically analytical nature (Smeyers & Depaepe, 2018).

Understanding the perspectives of various stakeholders, including researchers, funding agencies, and policymakers, is essential for designing effective optimisation strategies. A 2022 study on small states' performance in EU Research in Innovation funding programmes explored the potential lack of consideration of small island states' needs and characteristics in such EU legislation (Schembri, 2022). As a result, the study highlighted the

challenges small island states like Malta face when applying for and acquiring funding (Schembri, 2022).

Additionally, another 2022 study which conducted a performance review of EU Funding Activities published in the European Research Studies Journal, emphasised the dire need for a stronger emphasis on the efficiency of funding activities and more studies measuring the performance of EU projects for a better future for all EU citizens (Perechuda, 2022).

Importance of Evidence-Based Approaches

Embracing an evidence-based approach is indispensable for comprehensively grasping the intricacies of a nation's needs, societal challenges, and research landscape. Adopting an evidence-based methodology refers to a systematic approach in which decisions are grounded in empirical evidence, data, and rational analysis rather than intuition or anecdotal experience alone. It involves identifying relevant research findings, evaluating their quality and relevance, and integrating them with other factors such as expertise, stakeholder values, and contextual considerations.

It is important to consider a bottom-up understanding of the practical aspects when carrying out funded research in order for these macro programmes and systems to better cater for the needs of researchers. Such an approach is likely to lead to more informed choices towards the desired outcomes, enhancing transparency, accountability, and effectiveness in decision-making processes across various domains. Ultimately, evidence-based decision-making strives to minimise bias, maximise objectivity, and optimise outcomes based on the best available information (Baba & HakemZadeh, 2012).

The concept of evidence-based decision-making is central to optimising research funding systems (Recio-Saucedo et al., 2022). Emphasising the need for data-driven decision-

making can guide Malta in aligning its funding strategies with national priorities and global trends.

Previous studies have emphasised the importance of evidence-based approaches in guiding funding allocation strategies (Bozeman & Sarewitz, 2011). By incorporating rigorous evaluation methods, policymakers can prioritise research initiatives with the highest potential for impact and value creation. Moreover, leveraging tools such as cost-benefit analysis and outcome measurement frameworks enables stakeholders to assess the effectiveness of different funding models and interventions. Through evidence-based decision-making, research funding agencies can allocate resources more efficiently, maximising the return on investment and fostering innovation.

Understanding Research Funding Systems

Research funding is a crucial pillar in fostering scientific advancement and innovation across nations. It serves as the financial backbone for researchers, institutions, and projects, enabling them to conduct investigations, experiments, and studies aimed at generating new knowledge and solving pressing societal challenges. Understanding the landscape of research funding is essential for optimising funding systems to ensure efficient allocation and impactful outcomes.

At the heart of research funding lies innovation, representing the pursuit of novel ideas and methodologies to propel societal transformation and economic progress (Packalen & Bhattacharya, 2020). Innovation drives growth by fostering entrepreneurial endeavours, spawning new industries, and creating jobs (Cornelius, 2020). By strategically allocating research funds, governments and organisations empower researchers to explore uncharted territories, unlocking solutions to some of the most pressing global issues.

Research funding can be broadly categorised into several types based on sources, mechanisms, and objectives. These include national funding, bilateral agreements, and international programs such as the European Union's Horizon 2020 and Horizon Europe initiatives. Such programs enable researchers to access resources and expertise beyond national borders, fostering global collaboration and knowledge exchange (Malta Council for Science and Technology, 2024).

The performance-based research funding systems (PBRFs) that emerged in countries like the UK, Australia, and New Zealand during the 1980s and 2000s sought to address the need for more efficient research funding allocation (Hicks, 2012). In the UK, the introduction of the Research Assessment Exercise (RAE) in 1986 marked a shift towards evaluating research quality to allocate funding. Australia and New Zealand followed similar trajectories, with Australia adopting a composite index and New Zealand implementing the Performance-Based Research Fund (PBRF) in 2002 (Cornelius, 2020). These systems aimed to justify public support for university research by demonstrating excellence and incentivising institutions to improve research performance (Hicks, 2012).

While these systems have increased the competitiveness of university research, they have also drawn criticism for placing excessive pressure on researchers to meet specific metrics, which can discourage risk-taking or innovative approaches (Hicks, 2012). In contrast, countries such as Germany and Japan have adopted a centre-of-excellence model, concentrating funding on select universities with the aim of achieving international research excellence through long-term investments (European Commission, 2017; Hicks, 2012). A long-term comparison between these models could provide valuable insights into their effectiveness in fostering high-impact research (Hicks, 2012).

In the United States, research funding systems function differently. University rankings, such as those from U.S. News & World Report, heavily influence institutional prestige, but they do not directly determine research funding allocation (Hicks, 2012). Instead, universities in the U.S. rely on institutional autonomy and discretionary resources, allowing them to compete for both public and private funding (Hicks, 2012). This system contrasts with the PBRFs in other countries, where research funding is directly tied to performance evaluations (Hicks, 2012).

Within the framework of the European Union, the Horizon 2020 and Horizon Europe funding systems were established to tackle scientific, societal, and economic challenges within the region. These programs aimed to address issues such as the fragmented nature of R&I efforts across Europe, increasing global competition, and pressing concerns like climate change, health crises, and energy security (Tenhunen-Lunkka & Honkanen, 2024). By fostering collaboration and providing substantial financial support, the EU sought to enhance its leadership in science and innovation while addressing these global challenges efficiently (Tenhunen-Lunkka & Honkanen, 2024).

Aligned with the Europe 2020 strategy, Horizon 2020 had three primary objectives: advancing frontier research through 'Excellent Science,' supporting technological development and empowering innovative Small and Medium Enterprises (SMEs) under 'Industrial Leadership,' and addressing critical societal issues such as climate change under 'Societal Challenges' (European Parliament, 2017). Contributing to these efforts, the Joint Research Centre (JRC) provided scientific advice, while the European Institute of Innovation and Technology (EIT) promoted collaboration between education, research, and innovation through knowledge and innovation communities (KICs) (European Parliament, 2017).

Horizon Europe builds on the foundations of Horizon 2020, continuing to support frontier research, researcher training, and industrial competitiveness while addressing societal challenges like climate change, digital transformation, and energy transition (European Commission, 2022; Veugelers & Cincera, 2015). With an increased budget of €95.5 billion, Horizon Europe strengthens synergies with other EU initiatives such as Digital Europe and InvestEU to maximise impact (Veugelers & Cincera, 2015). It retains Horizon 2020's competitive grant model, with proposals evaluated based on excellence, impact, and implementation potential (Veugelers & Cincera, 2015).

Both programs not only foster academic and scientific advancement but also drive economic growth and job creation across Europe. By encouraging collaboration between researchers, businesses, and public sector organisations, Horizon Europe continues to enhance European competitiveness and innovation.

Research funding facilitates the pursuit of new ideas and the expansion of knowledge boundaries within academic disciplines. It empowers researchers to explore uncharted territories, uncover fundamental truths, and push the boundaries of human understanding. Investments in research funding sustain institutional infrastructure and human capital, strengthening the research capacity of academic institutions. By providing resources for state-of-the-art facilities, equipment, and talented personnel, research funding lays the foundation for groundbreaking discoveries and scholarly achievements. Additionally, research funding supports the training and mentorship of future generations of scientists, scholars, and innovators.

As a member of the European Union, Malta can leverage these funding sources, as well as national resources to cultivate a dynamic research ecosystem that drives excellence, innovation, and societal impact. The research funding system serves as the backbone of

academic inquiry and societal advancement, supplying the crucial resources necessary to propel discovery, innovation, and problem-solving (Jong et al., 2021). These resources empower researchers to conduct studies, test hypotheses, and devise solutions to pressing social, economic, and environmental challenges (Jong et al., 2021). Malta's research funding landscape depends on a number of key structural players, which due to their active involvement, role and/or mandate, significantly influence the allocation of resources, the setting of research priorities, and the promotion of innovation across various sectors. These key players include funding opportunities at the national, international, or co-funded levels, represented by the responsible public authority, national research funding organisations, research and knowledge dissemination organisations, national chambers, and the private sector briefly described and visualised below.

a) The Office of the Prime Minister, European Funds, Equality, Reforms and Social Dialogue

   The Office of the Prime Minister, European Funds, Equality, Reforms and Social Dialogue (OPM-EES), supported by the Permanent Secretary for EU Funds, plays a crucial role in overseeing and managing the effective utilisation of EU funds in Malta (J. Vassallo, personal communication, October 7, 2024). This involves strategic coordination across multiple divisions to ensure that the country efficiently absorbs and implements European aid (J. Vassallo, personal communication, October 7, 2024). Key entities under the OPM-EES' portfolio include the Planning and Priorities Coordination Division, which focuses on cohesion policies and strategic fund management, and the Funds and Programme Division, responsible for guiding the use of allocated EU funds across sectors such as fisheries, agriculture, and home affairs (J. Vassallo, personal communication, October 7, 2024). Additionally, divisions like the Measures and Support Division facilitate enterprise support, while the European

Union Programme Agency manages educational funding initiatives (J. Vassallo, personal communication, October 7, 2024). OPM-EES also ensures comprehensive stakeholder engagement, from providing access to EU funds through entities like *Servizzi Ewropej f'Malta* to developing strategic frameworks for EU policies and managing fund disbursement through the Strategy and Implementation Division (J. Vassallo, personal communication, October 7, 2024).

b) National Research Funding Organisations

Malta's research funding landscape features several key organisations and entities that support a wide range of research initiatives. Xjenza Malta, formerly Malta Council for Science and Technology, the primary government body responsible for coordinating R&I in Malta oversees national research policy and manages various funding programs aimed at promoting scientific research and technological development (Xjenza Malta, 2024). Additionally, Malta Enterprise, the national economic development agency offers financial support, through grants and funding opportunities for businesses engaging in R&I (Malta Enterprise, 2019). Malta Enterprise aims to foster economic growth through technological advancement (Malta Enterprise, 2019).

c) Research and Knowledge Dissemination Organisations (RKDOs)

RKDOs are entities primarily focused on conducting research and disseminating knowledge to advance understanding in various fields (Kebapci et al., 2020). The University of Malta and Malta College of Arts, Science & Technology are two key higher education institutions in Malta, each serving distinct roles. Established in 1592, UM is Malta's oldest and most prestigious academic institution, offering a broad range of undergraduate and postgraduate programs with a strong emphasis on research and

academic excellence (University of Malta, 2020a). In contrast, the Malta College of Arts, Science & Technology, founded in 2001, focuses on vocational education and training, providing industry-relevant programs that equip students with practical skills through hands-on learning and internships (Malta College of Arts, Science and Technology, 2022). Together, these institutions play a crucial role in research and development in Malta, participating in various national and international projects (Malta Council for Science and Technology, 2024b). Both institutions have their own internal funding mechanisms to support research projects conducted by faculty and students, often in collaboration with external partners (Malta Council for Science and Technology, 2024b).

d) National Chambers

In Malta, national chambers play a vital role in fostering innovation and research by representing and advocating for various sectors of the business and professional community. They influence policy decisions that affect research funding and innovation initiatives, provide networking opportunities for collaboration among researchers and industry professionals, and offer support and resources to help members navigate challenges and access funding for research projects (Malta Chamber of SMEs, 2014; The Malta Chamber, 2020; University of Malta, 2020b). By promoting entrepreneurship and innovation, chambers contribute to the overall economic growth and competitiveness of the country, while also providing valuable insights and data on market trends and sector-specific issues. Ultimately, these chambers act as essential intermediaries between the research community, businesses, and the government, facilitating dialogue and creating a conducive environment for the advancement of innovation and research in Malta (Malta Chamber of SMEs, 2014; The Malta Chamber, 2020; University of Malta, 2020b).

e) Private sector and Non-Governmental Organisations (NGOs)

Several private companies and NGOs in Malta also self-fund their research, often focusing on specific fields such as health, education, or social development (Times of Malta, 2012). These organisations may fund independent research or partner with public institutions to promote innovative projects (University of Malta, 2024). These organisations collectively form a cohesive network, leveraging each other's strengths and resources to enhance Malta's research capabilities and innovation potential. Their collaboration fosters an environment where knowledge, technology, and economic development can flourish, positioning Malta as a hub for R&I (Malta Council for Science and Technology, 2024b).

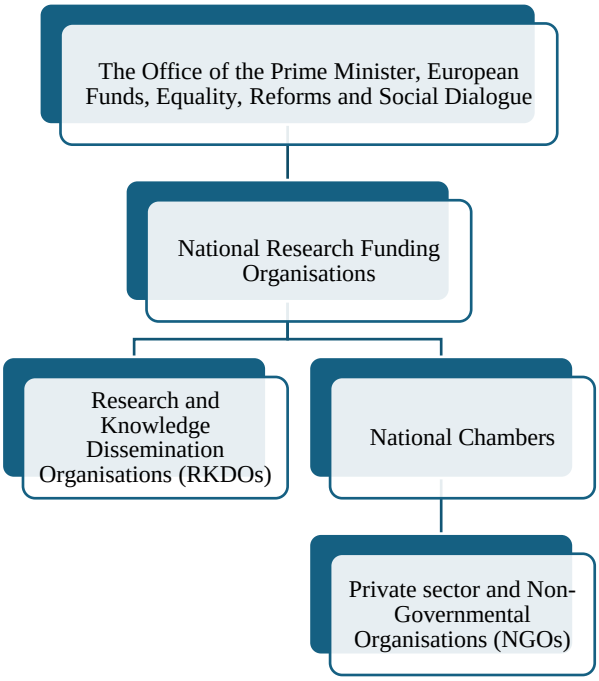

Figure 1: Visualised Structure of Malta's Research Funding Landscape

Between 2019 and 2022, the research and development (R&D) funding landscape in Malta shows distinct patterns between the public sector, academia, and the private sector (National Statistics Office, 2024). The private sector, mainly composed of business enterprises, is predominantly self-funded. Over 98% of its funding comes from business

enterprises, both local and foreign, with little reliance on government support (National Statistics Office, 2024). While the private sector does engage with European Commission-funded projects for specific innovation efforts, its overall share of R&D funding has steadily declined, from 12.75% in 2019 to 4.63% in 2022 (National Statistics Office, 2024). Despite its strong self-investment, the sector's involvement in European-funded projects peaked at 34.47% in 2021, before falling to 26.32% in 2022 (National Statistics Office, 2024). This suggests that while the private sector plays a role in R&D, it primarily relies on its own resources and selectively participates in externally funded initiatives.

In contrast, academia, particularly the higher education sector, is heavily reliant on public funding (National Statistics Office, 2024). Universities and research institutions in Malta receive significant support from direct government funding, university funds, and European Commission grants (National Statistics Office, 2024). The higher education sector's share of public funding grew from 69.45% in 2019 to 82.02% in 2021, illustrating its sustained dependence on government and European resources (National Statistics Office, 2024). Additionally, academia has been the primary beneficiary of European Commission funding, securing more than 64% of available funds, peaking at 75.64% in 2019 and maintaining 72.48% in 2022 (National Statistics Office, 2024). This highlights the central role of public and European funding in advancing academic research in Malta, ensuring that universities remain at the forefront of R&D efforts in the country.

The public and academic sectors in Malta are predominantly supported by government and European funding, while the private sector remains largely self-reliant, engaging selectively in European Commission projects. This funding landscape highlights a potential gap in collaboration between the private sector and academia. Although academia benefits significantly from government and European Commission support for research, the private sector continues to be mostly self-funded, with limited reliance on public funds. The

private sector's relatively low participation in collaborative research with academia indicates untapped opportunities for partnerships that could drive innovation and the commercialisation of research outcomes. Enhancing private–academic relations could create a more cohesive research ecosystem, allowing both sectors to capitalise on shared knowledge, resources, and funding opportunities.

To fully harness research funding, policy adjustments could encourage stronger partnerships between the private sector and academic institutions, ensuring both sectors contribute to and benefit from Malta's evolving research landscape.

Challenges in Securing Research Funding

Securing research funding presents a complex challenge, requiring researchers to navigate numerous hurdles. Crafting a compelling proposal is only the first step; applicants must also contend with opaque selection processes, prolonged waiting periods for results, and meticulous application requirements (Martin, 2000). A lack of transparency in the selection process, combined with the absence of constructive feedback for unsuccessful applicants, makes it difficult for researchers to refine their proposals for future submissions (European Commission, 2023; Mastrantonio, 2023). Additionally, the substantial time investment required for applications places strain on researchers' schedules and resources, while collaborative mandates add further complexity, necessitating extensive networking and adaptation to fund-specific criteria (Mastrantonio, 2023). Balancing these demands alongside academic responsibilities is a significant challenge for many researchers.

In Malta, researchers face particular difficulties due to the country’s small research ecosystem and limited public R&D spending. Xjenza Malta has introduced several national funding programs, but access to large-scale EU funds, remains limited. Malta’s participation rate in EU programs lags behind other small countries, with only €37.46 million being

secured from Horizon 2020, a stark contrast to Estonia's €273.7 million (European Commission, 2021). This discrepancy highlights challenges in building the capacity required to compete effectively for European funds. In response, Malta has been working on enhancing its national funding schemes and improving collaboration with foreign partners to boost its international research standing (Malta Council for Science and Technology, 2024a).

Despite these challenges, grant writing offers several advantages. The process often serves to advance or refine scientific thinking, consolidate research efforts, stimulate new ideas, foster collaborations, and maintain a focus on overarching research goals (von Hippel & von Hippel, 2015). Written material produced during grant applications can also be repurposed for future academic publications or conference presentations, making the process more valuable even when funding is not secured.

However, one significant downside is the possibility of proposals not receiving funding, which remains a common concern among researchers. This outcome is particularly discouraging when success rates for funding opportunities are low, as it increases the likelihood of even high-quality proposals going unfunded (von Hippel & von Hippel, 2015). These low success rates raise critical questions about the opportunity costs of investing significant time and effort into crafting proposals with limited prospects for financial backing. Researchers, especially those early in their careers, may find themselves consistently facing barriers to secure support for their projects, which can hinder long-term research progress and innovation.

In Estonia, a country often cited as a model for successful research development, the government has invested heavily in R&D, aiming to foster an environment conducive to innovation (Estonian Research Council, 2021). Estonia's strategic focus on digital infrastructure, smart specialisation, and public-private partnerships has enabled it to attract

significant EU funding, including from Horizon 2020 (European Commission, 2021). The Estonian Research Council provides multiple funding schemes that aim to integrate national efforts with European initiatives, fostering strong ties between academia, industry, and international collaborators (Estonian Research Council, 2021). Such a proactive approach has allowed Estonia to overcome challenges similar to those faced by Malta, including limited resources and a small domestic market, making it a relevant comparison.

Collaboration and the cross-fertilisation of ideas are potential benefits of securing research funding. Sharing grant applications, particularly in collaborative projects, can create additional opportunities for joint research and the application of ideas by others. However, researchers may harbour concerns about the potential appropriation of their ideas before they have the opportunity to execute them, particularly if unsuccessful applications are made publicly available at a later stage (Horbach et al., 2022). This fear of being "scooped" can deter open sharing, potentially limiting the collaborative benefits of the funding process.

Additionally, applying for research funding demands a considerable time investment, which diverts attention away from actual research activities. Studies have highlighted inherent biases in the funding process, including racial disparities in grant awards and low levels of agreement among reviewers, indicating systemic inequalities (Chawla, 2018). The peer review process, while critical to maintaining quality, may also favour established researchers over junior ones, contributing to a perception of unfairness and a lack of transparency (Chawla, 2018). Addressing these systemic issues is crucial for fostering greater equity and inclusivity in the research funding landscape.

The funding environment is also shaped by broader economic and policy factors. In the UK, for instance, research activities are heavily dependent on cross-subsidies from international students, linking the teaching and research missions of universities in strategic

and financial ways (Butland, 2022). Changes in the balance of funding streams, such as reduced income from international students, could have wide-ranging impacts on research organisations, with different disciplines and institutions affected in varying ways (Butland, 2022). As research funding is not isolated from economic and policy shifts, fluctuations in the financial behaviour of funding organisations, international markets, and policy decisions on higher education and international relations can all influence the availability of research funding.

To address these challenges, funding bodies can play a pivotal role in how they allocate budgets, design programs, assess the costs of grants, and provide institutional funding. These organisations may need to make difficult decisions, such as funding fewer projects but at a more sustainable level, to ensure the long-term viability of the research ecosystem (Butland, 2022). Reforms aimed at fostering greater transparency, reducing biases, and creating equitable opportunities for researchers at all career stages will be essential in building a more inclusive and effective funding landscape.

Current State of Research Funding Systems in Malta

An overview of the current state of R&I in Malta reveals a blend of strengths, weaknesses, and opportunities for growth. Malta's proactive approach to economic restructuring and expansion serves as a promising catalyst for bolstering R&I efforts in both the public and private sectors. Recent growth in professional, scientific, technical, and support service activities highlights the country's increasing potential in R&I (Malta Council for Science and Technology, 2024b). A notable shift toward higher value-added sectors has expanded employment opportunities within knowledge-intensive fields, particularly in health, technology, and manufacturing (Malta Council for Science and Technology, 2024b). The government's introduction of new funding initiatives and efforts to foster a culture of science are gradually nurturing a more supportive environment for R&I.

However, despite these positive developments, Malta's R&I system remains underfunded, with investment levels trailing behind GDP growth. This under-investment is reflected in Malta's Gross Expenditure on Research and Development (GERD), which falls short of supporting broader innovation efforts (Malta Council for Science and Technology, 2024b). Furthermore, Malta lags significantly behind other small EU member states, such as Estonia and Cyprus, in securing funding from major European programs like Horizon 2020 (Schiermeier, 2020). Malta's EU contribution amounted to just 37.46 million Euros, representing 0.05% of Horizon 2020 expenditure—far less than Estonia's 273.7 million Euros and Cyprus's 319.8 million Euros (European Commission, 2021). These discrepancies highlight Malta's need for greater engagement with European funding opportunities and underscore the systemic underperformance of its R&I sector on the international stage.

The demand for research, development, and innovation products, services, and public infrastructure remains underdeveloped in Malta, as does the ecosystem for R&I-focused startups. While there have been strides in promoting science literacy and improving science communication, public awareness of R&I remains limited. Moreover, the integration of scientific advice into government policymaking is improving, but its application remains inconsistent across different ministries (Malta Council for Science and Technology, 2024b). Despite a 6.7% improvement in R&I performance between 2015 and 2022, challenges persist in financial support, employment impacts, and corporate investments (Malta Council for Science and Technology, 2024b).

Malta excels in specific R&I indicators, such as international scientific co-publications, the enrolment of foreign doctorate students, and the collaborations of innovative SMEs with external entities (Malta Council for Science and Technology, 2024b). However, public sector R&D expenditure and government support for business R&D remain below EU benchmarks, limiting Malta's ability to participate fully in European and international R&I

initiatives (Malta Council for Science and Technology, 2024b). There is significant untapped potential for Malta to capitalise on emerging high-value sectors, particularly within the digital and green economies.

To address these challenges, consistent investment in both public and private R&I sectors is crucial, with a medium to long-term outlook. Malta's R&I strategy emphasises cross-ministry integration, governance improvements, and alignment with the Research & Innovation Smart Specialisation (RIS3) framework to support innovation-driven growth (Malta Council for Science and Technology, 2022; Malta Council for Science and Technology, 2024b). However, Malta faces the risk of over-specialisation due to its small size and limited research capacity, making it essential to strike a balance between specialisation and diversification to maintain competitiveness (Malta Council for Science and Technology, 2022).

Leveraging Malta's strengths in niche markets such as health, aviation, and high-value manufacturing, as well as test-bed environments for energy generation and water desalination, could enhance its competitive edge (Landabaso, 2014). By integrating bottom-up consultations with enterprises and top-down policy initiatives, Malta’s R&I strategy aims to create a cohesive national framework that capitalises on both grassroots insights and national resources (Malta Council for Science and Technology, 2024b). This hybrid approach is essential for Malta to build a resilient, innovation-driven economy that can continue to grow in strategic high-value sectors (Landabaso, 2014).

Advancing Malta's Research and Innovation Landscape

Malta's priorities encompass embedding R&I as fundamental components of the nation's economy, stimulating knowledge-based and value-added growth. Key objectives include attracting and mobilising young researchers and harnessing state-of-the-art

technologies across sectors such as environment, transportation, food and agriculture, water, and energy (Malta Council for Science and Technology, 2024b). Moreover, the strategy underscores the imperative for significant investments in smart manufacturing, adoption of low-carbon and circular economy methodologies, leveraging ICT and AI for secure online business operations, and fostering targeted innovations to tackle energy-related challenges and concerns (Malta Council for Science and Technology, 2024b).

Taking a pragmatic view of Malta's R&I landscape reveals an expanding and dynamic community. However, the space struggles with significant challenges. A 2017 Research and Innovation Observatory country report delineated key hurdles, including the need to bolster R&I investment in the private sector, enhance the capacity and quality of the scientific foundation, and fortify support for entrepreneurship and innovation output (Warrington & Hristov, 2018). The report examined the current status quo and delineated strategies undertaken to tackle these challenges (Warrington & Hristov, 2018). To address the decline in private-sector Research and Development (R&D) investment, the government-initiated funding schemes and tax incentives aimed at stimulating private-sector R&D activities (Warrington & Hristov, 2018). Concurrently, initiatives like the SME Diversification and Innovation Grant Scheme, alongside augmented funding for the Fusion Technology Development Programme, aim to invigorate private sector R&D endeavours. Moreover, undertakings to elevate the quality of the scientific infrastructure entail investments in human capital and research facilities, exemplified by scholarship schemes such as STEPS and infrastructural enhancements at the University of Malta (Warrington & Hristov, 2018).

Lastly, to galvanise entrepreneurship and innovation, the government introduced initiatives such as the Business Start scheme and Venture Capital Malta to foster startup growth and streamline access to financial resources (Warrington & Hristov, 2018). While progress has been evident, challenges persist, notably in bureaucracy reduction and

innovation enhancement, necessitating thorough evaluation and sustained action (Warrington & Hristov, 2018).

However, notwithstanding strides made, Malta still trails behind in key benchmarks compared to the EU average. In 2022, Malta's R&D expenditure was 0.6% of its GDP, significantly below the EU average of 2.27%, placing the country 26th out of the EU-27 (Eurostat, 2024). Despite recommendations from various stakeholders, including The Malta Chamber, on strategies to boost business participation in R&D, the government has yet to announce any further commitments in this area (The Malta Chamber, 2024).

The Importance of an Implementation Aspect in Research

The relationship between research and societal development is complex, and the mere abundance of research does not necessarily translate into tangible benefits for society (Ludwig Boltzmann Gesellschaft, 2021). This issue is often attributed to a lack of implementation of research findings, a disconnect between research and practice, and challenges in translating research into policy and practice (Bero et al., 1998).

In terms of project implementation, the European Union (EU) is known for its collaborative, multi-stakeholder approach, which is a key strength. Programs such as Horizon Europe foster extensive collaboration across borders and disciplines, creating consortia that bring together academic institutions, private companies, and governments (European Commission, 2020a). These collaborations are designed to address complex societal challenges, including climate change, digital transformation, and public health (European Commission, 2020a). However, the EU’s bureaucratic processes and lengthy administrative hurdles often delay the implementation of research projects, which can limit the immediate impact of research findings compared to other regions (ERA LEARN, 2024).

In the United States, project implementation tends to be more streamlined, particularly in fields such as defence, health, and technology (Mazzucato, 2013/2015). Agencies such as DARPA (Defense Advanced Research Projects Agency) and NIH (National Institutes of Health) are well-known for quickly turning research into practical applications (Mazzucato, 2013/2015). This efficiency is partly due to flexible funding mechanisms and close partnerships with the private sector, enabling faster transitions from research to real-world impact (Mazzucato, 2013/2015).

In Asia, project implementation is often accelerated by government-led initiatives. For instance, in China, the government plays a significant role in steering research projects towards industrial application, particularly in fields like artificial intelligence (AI), biotechnology, and green energy (Appelbaum et al., 2018). National strategies like Made in China 2025 focus on linking research directly with industrial and technological goals, ensuring faster implementation through public-private collaborations (Appelbaum et al., 2018).

Bridging the Gap between Research and Societal Development

The relationship between research and societal development is indeed intricate, with the sheer volume of research not always equating to tangible benefits for society (Bornmann, 2012). This assertion finds support in various factors, foremost among them being the failure to implement research findings effectively. Despite the wealth of research produced, there often exists a gap between the generation of knowledge and its practical application in society (Bornmann, 2012). This disconnection between research and practice further compounds the issue, as valuable insights gathered from research efforts may not find their way into real-world solutions or interventions.

Whilst partnerships between academia, industry, and government hold great potential for driving innovation and addressing societal challenges, the predominant focus on outputs and outcomes often overlooks the crucial aspect of implementation (Etzkowitz, 2017). Consequently, the full potential of these partnerships to effect meaningful change in society may remain unrealised. Thus, it might be ideal to place a greater emphasis on ease and efficiency of implementation within the evaluation criteria of funding programmes (Huey-Tsyh Chen, 2005).

Firstly, the lack of implementation of research findings is a significant barrier to societal development. Researchers often focus on producing high-quality research, but they may not consider the practical implications of their work or how it can be applied in real-world settings. As a result, research findings may remain in academic journals, unread and unapplied by practitioners, policymakers, and other stakeholders. For instance, a study on the implementation of evidence-based practices in social work found that practitioners often lack the knowledge and skills to apply research findings in their work, leading to a gap between research and practice (Franklin & Hopson, 2007).

Secondly, there is often a disconnection between research and practice, which can hinder the application of research findings. Researchers may not fully understand the needs and challenges of practitioners, policymakers, and other stakeholders, while practitioners may not be aware of the latest research findings or may not have the resources to implement them (Rubin, 2014). This disconnection can lead to a lack of trust and collaboration between researchers and practitioners, further hindering the application of research findings. As a result, research findings may not be translated into policy or may be distorted in the policy-making process, leading to policies that are not based on the best available evidence. Thirdly, there may be cultural and institutional barriers to the application of research findings. For instance, a study on the implementation of evidence-based practices in education found that

there may be resistance to change among practitioners, policymakers, and other stakeholders, leading to a reluctance to adopt new practices based on research findings (Lovelace et al., 2017).

The lack of implementation of research findings, the disconnection between research and practice, the challenges in translating research into policy and practice, cultural and institutional barriers, and ethical and legal considerations can all hinder the application of research findings. Therefore, it is crucial to bridge the gap between research and practice, promote collaboration between researchers and practitioners, and ensure that research findings are translated into policy and practice in a responsible and ethical manner.

Increasing the chances of successful implementation also hinges on prioritising quality over quantity. Performance-based funding Systems (PBFS) represent a funding model utilised in higher education and research. In the realm of higher education, PBFS allocate a portion of a state's higher education budget based on specific performance metrics like course completion, credit attainment, and degree completion, rather than solely on enrolment figures (OECD, 2010). This approach offers a more holistic perspective on how institutions utilise state funding to support students throughout their academic journeys and to foster course and degree completion (OECD, 2010). A study investigating the impact of PBFS on national research systems examined publication numbers and their scientific impact (citations or publications in top-ranked journals) across 31 countries from 1996 to 2016 (OECD, 2010). The findings revealed that, on average, PBFS resulted in a rise in publication numbers, albeit with a temporary effect that waned over time (OECD, 2010). While PBFS had a limited impact on research excellence, particularly in terms of articles published in prestigious journals, they did influence average research quality by impacting the number of citations per paper normalised to the respective field (OECD, 2010).

Addressing Implementation Challenges in Research Projects

The importance of implementation in research lies in its ability to bridge the gap between research and its real-world application, ensuring that research findings are effectively translated into practice (Binagwaho et al., 2019). While investing in research is crucial, it must be complemented by substantial investment in the implementation of promising research projects that meet key criteria for potential success.

For small island states like Malta, implementing ideas generated by local researchers, particularly those influenced by a distinctly Maltese perspective, holds significant value. Such initiatives can lead to innovative solutions tailored specifically to the island's unique challenges and opportunities. Furthermore, empowering local researchers by providing clear pathways for implementation and support can inspire greater commitment to research. This, in turn, facilitates skill development and fosters the creation of businesses that contribute to Malta’s economic and social growth.

To achieve these outcomes, a stronger connection between academia and industry is essential. Increased investment in implementation strategies and support for research offers a practical means of bridging this divide. Enhanced collaboration between these realms not only encourages knowledge transfer but also lays the groundwork for a more cohesive research ecosystem that benefits both sectors.

In essence, the importance of implementation in research lies in its ability to sustain evidence-based policies, recognise the role of contextual factors in the success of implementation strategies, and guide decision-makers and implementers in adapting interventions to diverse real-world contexts (Edwards & Barker, 2014). By fostering a learning environment, strengthening systems, and equipping stakeholders with the knowledge

and tools needed to implement and scale interventions effectively, research can promote positive change and accelerate societal progress (Binagwaho et al., 2019).

However, as highlighted by a study conducted by Raelene Galea in 2020, the implementation of policies, such as those favouring open research data, can face significant barriers (Galea, 2020). Galea (2020) explored academics' perspectives on open research data at the University of Malta and identified several factors that hinder the adoption of a data-sharing culture. These included a lack of education and awareness, which has led many researchers to base their reluctance to share data on misinformed beliefs (Galea, 2020). Additionally, scholars are not sufficiently incentivised to participate in open data practices, with many citing the process as time-consuming and perceiving it as an 'administrative burden' rather than a tool to enhance the reliability and credibility of their research (Galea, 2020). The study also noted that researchers' willingness to disclose raw data depends heavily on their field of study, especially in cases where subject sensitivity is a concern (Galea, 2020). Such findings underscore the broader challenge of aligning academic practices with research implementation goals and the need to address cultural, administrative, and logistical barriers (Galea, 2020).

Despite the availability of funding, many research projects encounter implementation challenges that hinder their success. One critical issue is the gap between academic research and real-world application. Academic studies often focus on theoretical frameworks and experimental findings, neglecting practical considerations such as scalability, feasibility, and stakeholder engagement (Sarewitz, 2016). As a result, funded research may fail to translate into tangible outcomes or address pressing societal needs. Addressing this gap requires a shift towards a more applied research paradigm, where projects are designed and executed with implementation in mind. Galea's findings emphasize the importance of stakeholder consultation, awareness campaigns, and incentives to overcome these challenges (Galea,

2020). It is possible that by integrating operational aspects into the research process, such as stakeholder consultation, pilot testing, and knowledge exchange activities, researchers can increase the likelihood of project success and societal impact (Rubin, 2014).

Another significant challenge in research funding implementation relates to human capacity and leadership capabilities. Project leaders often face high levels of stress, competing priorities, and resource constraints, which can impede their ability to effectively manage funded projects (Hall et al., 2008). Moreover, administrative burdens, such as grant reporting requirements and compliance procedures, place additional strain on research teams, diverting time and resources away from core activities (National Science Board, 2014). To address these challenges, research funding agencies must invest in capacity-building initiatives and provide support services to project leaders (Smits & Denis, 2014). By enhancing leadership skills, fostering interdisciplinary collaboration, and offering tailored support mechanisms, funding agencies can empower researchers to navigate complex implementation challenges and deliver meaningful outcomes.

Conclusion

This chapter has laid the groundwork for shaping the research questions and methodological approach of this work by highlighting critical themes that will guide the investigation into Malta’s research funding systems. It has underscored the importance of understanding the diverse challenges researchers face, particularly in securing funding, navigating administrative complexities, and aligning research priorities with national and EU strategies. Key insights from existing literature emphasise that while EU programs like Horizon Europe offer substantial opportunities, Malta's limited capacity to access these resources necessitates a deeper exploration of local barriers and optimisation strategies.

This review of available literature also stressed the value of evidence-based decision-making, which is pivotal in designing funding mechanisms that are not only efficient but also aligned with the practical realities faced by researchers. This informed the adoption of a pragmatic qualitative approach, ensuring that the research captures nuanced insights directly from stakeholders involved in Malta's research funding landscape. By identifying gaps in current systems, such as limited collaboration between academia and industry, the chapter refines the study's focus on strengthening these partnerships.

These findings directly inform the research design, guiding the development of interview questions that probe into the lived experiences of researchers and other key stakeholders. The following chapter, rooted in the insights gathered from the literature, will outline the strategies implemented to conduct this study. It delves into details explaining why certain decisions were made, and the obstacles faced.

Methodology

Overview

This chapter outlines the methodological framework for the study, which was developed in alignment with its aims, research questions, and the literature review findings. The methodology was designed to effectively gather the necessary data and address the research topic in order to achieve the desired outcomes. Specifically, the study seeks to explore the strengths and challenges researchers face when pursuing research funding opportunities, as well as how these challenges can be mitigated.

In the design of the research methodology, several critical decisions were made, including the identification of the target population, selecting an efficient method for contacting potential participants, determining the questions to ask participants, and addressing other relevant issues. This chapter will discuss these points and their significance in the research design process, ensuring that the methodology aligns with the research objectives and produces meaningful results.

Research Design

Identifying the approach, sample population and sample frame

The research employs a qualitative approach, aiming to explore the obstacles researchers face in accessing funding opportunities and suggest strategies for reducing these hindrances. Such an approach was adopted to gain a deeper understanding of the intricate dynamics and contextual nuances inherent in Malta's research funding systems. Unlike quantitative approaches that prioritise numerical data and statistical analysis, qualitative methods allow for the exploration of the rich, multifaceted perspectives and experiences of stakeholders involved in the research funding process. (Becker, 1998; 2017). Through in-depth interviews, qualitative research enables the capture of nuanced insights, diverse

viewpoints, and subjective interpretations that may not be adequately captured through quantitative surveys or statistical models (Becker, 1998; 2017). Additionally, qualitative methods provide the flexibility to adapt the research approach in real time, allowing for the exploration of emergent themes and the refinement of research questions based on ongoing analysis (Becker, 1998; 2017).

A pragmatic epistemological framework was adopted to combine the subjective and objective dimensions of investigation, aligning with the study's aim of providing practical recommendations for optimising research funding systems (Avenier and Thomas, 2015). This framework is particularly well-suited for an evidence-based approach, as it emphasises the application of concepts and methodologies that are directly relevant to real-world practices (Avenier and Thomas, 2015). It values the practical outcomes of research, focusing on the utility of findings and their application in diverse contexts (Avenier and Thomas, 2015).

In striving for research quality, this framework adheres to fundamental principles such as reliability, inference quality, construct quality, and generalisation, which are essential in any rigorously conducted research projects (Gibbert et al., 2008). These principles, though universally important, take on specific meanings depending on the epistemological framework employed (Amis and Silk, 2008). For example, in interpretivist frameworks, the concept of reliability might be reinterpreted as "truthfulness" (Sandberg, 2005), "trustworthiness" (Guba and Lincoln, 1989; Schwartz-Shea, 2014), or "credibility" (Charmaz, 2006), reflecting different underlying assumptions about the nature of knowledge.

Within the pragmatic framework, reliability retains its importance but is understood through the lens of practical applicability (Avenier and Thomas, 2015). Quality of inferences and constructs is linked to the rigor and relevance of data collection and analysis (Avenier and Thomas, 2015). Construct quality, for instance, is defined as the ability to create clear,

meaningful categories that structure experience (Suddaby, 2010). This quality is first related to the accuracy and thoroughness of data collection and the inferential processes that allow researchers to abstract meaningful constructs from the data (Tsoukas, 2018).

Generalisation, or external validity in positivist and post-positivist frameworks, is also treated distinctively within the pragmatic framework (Avenier and Thomas, 2015). It extends beyond the empirical basis of knowledge claims to their broader applicability (Avenier and Thomas, 2015). While qualitative research is often criticised for its perceived limitations in generalisation, particularly in case studies (Pratt, 2009), the pragmatic approach acknowledges multiple forms of generalisation (Lee and Baskerville, 2003; Tsang and Williams, 2012). These include abstraction and empirical testing, each contributing to theory-building, refinement, or testing, depending on the study's goals (Tsoukas, 2018). This flexibility in generalisation underscores the pragmatic framework's alignment with the study's aim to provide actionable insights for enhancing research funding systems (Avenier and Thomas, 2015).

The primary objective of this study is to enhance the efficiency and effectiveness of local research funding processes and outcomes in Malta. Consequently, in conducting interviews with stakeholders such as researchers, high-level individuals in EU funding, and research support directorates, a diverse range of perspectives were sought to comprehensively understand the dynamics of Malta's research funding systems. The goal was to engage a range of relevant stakeholders and individuals actively involved in the field to capture diverse perspectives. A key criterion for participant selection was their direct involvement in past or current research funding opportunities, ensuring they could provide first-hand experiences. This approach ensures that each participant brings a wealth of experience, allowing for a detailed and comprehensive description of the issues at hand.

Researchers were sought in order to provide valuable insights into the practical challenges of securing funding, ensuring alignment between research interests and funding priorities, and streamlining administrative procedures. Moreover, including high-level individuals in EU funding aims to contribute their expertise on EU funding frameworks, forward-looking strategies for maximising Malta's participation in EU research programs, and compliance with EU regulations. Meanwhile, research support directorates were included to provide knowledge on support services for researchers, capacity-building initiatives, and advocacy efforts for policy changes. Collectively, these perspectives are thought to feed a holistic understanding of the strengths, weaknesses, opportunities, and challenges within Malta's research funding ecosystem, guiding evidence-based recommendations for optimisation.

The researcher made a deliberate decision to exclude managing authorities from the study, instead prioritising a focus on beneficiaries, such as researchers and other key stakeholders. This choice was informed by the researcher’s prior professional experience, which already provides insight into the perspectives of managing authorities, ensuring that their viewpoints are indirectly considered. Including managing authorities would have broadened the study excessively, as it would have required expanding the scope to cover both national and European funding providers. By concentrating on beneficiaries, the study aims to provide a more focused analysis of the interventions' impacts, optimising the use of limited time and resources. The exclusion of managing authorities was thus a pragmatic approach to streamline the research within the project's constraints.

Sampling Method

Purposive snowball sampling was selected as the optimal sampling method for participant recruitment in this study due to its ability to access individuals within the target population who possess specialised knowledge and experience in R&I funding. This method

begins with identifying a few key informants who have the expertise relevant to the investigation, who are then asked to recommend others meeting the study's criteria, creating a "snowball" effect that expands the sample (Polkinghorne, 2005; Tongco, 2007).

This sampling technique is particularly effective when the research focuses on specific, niche expertise (Polkinghorne, 2005; Tongco, 2007). By leveraging existing networks, snowball sampling facilitates the inclusion of a diverse range of perspectives, enriching the data collection process with insights that might otherwise be overlooked (Polkinghorne, 2005; Tongco, 2007). The trust inherent in referrals also enhances participant engagement, as individuals are more likely to participate when approached through a trusted intermediary (Polkinghorne, 2005; Tongco, 2007).

Moreover, snowball sampling is both cost-effective and time-efficient, making it ideal for exploratory research where the goal is to uncover new insights and generate hypotheses (Naderifar et al., 2017). The method aligns with the pragmatic epistemological framework guiding this study, emphasising the importance of reliability, credibility, and the quality of inferences (Naderifar et al., 2017). By systematically expanding the sample through informed referrals, the study ensures that the data collected is both relevant and robust, contributing to a deeper understanding of the research topic (Naderifar et al., 2017).

In this context, snowball sampling not only broadens the scope of the research by including varied viewpoints but also strengthens the study's findings by ensuring that participants are well-informed and representative of the broader research community (Polkinghorne, 2005; Tongco, 2007). This approach is crucial for producing practical recommendations aimed at optimising research funding systems, as it captures a comprehensive and nuanced understanding of the field (Polkinghorne, 2005; Tongco, 2007).

Each identified individual was invited to contribute to the study by participating in an interview. Given the research questions, adopting a qualitative research approach was deemed essential for obtaining the detailed information required. This method aligns naturally with the needs of the study as qualitative research is particularly effective at revealing deep insights and new directions concerning human experiences and behaviours, as noted by Frankel & Devers (2000, p. 253). Interviews were conducted with the following individuals:

- 3 Representatives from different sections within the Research Support Services Directorate, University of Malta
- 4 Researchers from the University of Malta
- A Representative from the Malta University Innovation Portfolio
- 2 Researchers from the Malta College of Arts, Science & Technology
- 4 Representatives from national Chambers representing various sectors within the industry
- Prof Ing. Simon G Fabri, Pro-rector at the University of Malta
- Mr Jonathan Vassallo, Permanent Secretary (Funds), Ministry for The Economy, European Funds and Lands

Data Collection Method

Interviews were chosen as the primary data collection method for this study due to their effectiveness in exploring the thoughts and feelings of participants, which is central to understanding the motivations and behaviours that influence their actions. In qualitative research, the aim is not to generalise findings to a broader population but to gain deep insights into the specific experiences of individuals (Creswell & Poth, 1998/2024). This approach is particularly useful in contexts like pharmacy practice, where understanding the reasons behind behaviours, such as patients' nonadherence to medication or physicians'

resistance to pharmacists' clinical suggestions, is crucial (Polkinghorne, 2005). In the context of this research, such a data collection method proved useful in gathering insights and experiences, which helped to determine detailed thematics.

The role of the researcher in qualitative interviews is to access and interpret the thoughts and feelings of participants, a process that requires skill in forming accepting relationships, active listening, and focusing on the participant's experiential world (Seidman, 2019). The purpose of these interviews is to obtain detailed accounts from participants, which can then be analysed to interpret the meaning of the described phenomena (Seidman, 2019). This method is highly appropriate for this study, where the goal is to uncover rich, detailed insights that can inform future research and policy direction.

Moreover, interviews allow for the flexibility to delve into personal and sometimes sensitive experiences, which are essential for gaining a comprehensive understanding of the participants' perspectives (Creswell & Poth, 1998/2024). Given the complex nature of the topics being explored, interviews provided the most suitable approach to gather nuanced data, ensuring that the findings are both robust and reflective of the participants' lived experiences.

Each interview session was meticulously tailored to the individual category being interviewed, recognising the diverse roles and potential experiences they bring to the research process. By tailoring questions to the unique perspectives and experiences of each stakeholder group, the interviews aimed to delve deeply into their specific experiences, allowing for a richer and more comprehensive understanding of the subject matter. Inspiration on the questions posed during such interviews was taken from Formosa (2016). Unlike structured questionnaires, these interviews were designed to guide the discussion based on the interviewer's aims and the participant's responses, forming a semi-structure approach. This method ensures a dynamic "professional conversation," where the interviewer

follows and expands upon the participant's conversational threads to elicit a comprehensive account of their experiences (Seidman, 2019). The process involves transferring recalled experiences into spoken language, which is then transcribed for detailed analysis (Polkinghorne, 2005). Although some nuances, such as intonation and facial expression, are often lost in transcription, the goal is to capture the participant's authentic experiences (Polkinghorne, 2005). Memory and thoughts are inherently reconstructive, not exact replications of past events (Polkinghorne, 2005).

The semi-structured interview format chosen for this study also balances participant freedom with interviewer direction (Polkinghorne, 2005). This flexibility is particularly valuable for exploring complex and sensitive issues related to research funding. It allows participants to elaborate on their experiences in their own words, potentially uncovering themes or issues that might be missed in a more structured format (Creswell & Poth, 1998/2024). Additionally, it helps build rapport and trust, which is essential for candid communication, especially in such a close-knit community (Creswell & Poth, 1998/2024). Follow-up questions during the interviews probe deeper into topics that arise spontaneously, enhancing the depth and validity of the data (Creswell & Poth, 1998/2024). The interviewer effectively leveraged her sector expertise to challenge participants' perspectives, prompting more in-depth responses supported by specific examples. The interview inquiries were also carefully organised to align with the structured approach of obtaining research funding (Polkinghorne, 2005). Participants were asked about their experiences with different funding programs, the strengths and challenges of securing funding, and the role of collaborative research involving various stakeholders (Polkinghorne, 2005). The discussions covered operational challenges, administrative processes, reporting obligations, suggestions for improvement, and examples of successful research implementation (Polkinghorne, 2005). This semi-structured approach ensured that relevant questions were posed, facilitating a

comprehensive analysis of Malta's research funding systems and identifying factors influencing the effectiveness of current mechanisms (Polkinghorne, 2005).

All interviews were recorded and transcribed verbatim, with thematic analysis used to identify and categorise patterns or themes (Seidman, 2019). This systematic approach ensures that the study's conclusions are well-grounded and provides a robust basis for recommendations to optimise local research funding processes (Seidman, 2019).

To further enhance the depth of the data, individual interviews were chosen over group interviews to mitigate potential limitations on the level of expression. Group dynamics can sometimes inhibit participants from freely expressing their thoughts and opinions, particularly on sensitive or contentious topics (Ryu & Sandoval, 2015). By conducting individual interviews, participants had the opportunity to articulate their perspectives without concerns about peer influence or dominance within the group setting.

Notwithstanding, it is acknowledged that circumstances and contexts may vary, and there could be instances where group interviews might be more appropriate or beneficial. For example, certain topics or research areas may lend themselves better to collaborative discussions among multiple stakeholders (Ryu & Sandoval, 2015). The decision to prioritise individual interviews stemmed from the need to ask tailored questions that elicited insights specific to each participant's distinct role and perspective. Conducting interviews with individuals from multiple entities or authorities might have diluted the focus on each role, leading to more generic and less nuanced responses. Furthermore, the potential for hierarchical differences between researchers and research support officers, and the influence of power dynamics, was also considered undesirable. Therefore, the decision to conduct individual interviews was made after careful consideration of the research objectives, the nature of the topics under investigation, and the potential impact of group dynamics on data

quality. Nonetheless, it is important to remain flexible and open to adapting the methodology based on the specific requirements and nuances of the research context. This flexibility ensures that the data collection process remains robust and aligned with the overarching goal of optimising Malta's research funding systems through an evidence-based approach.

For practical reasons, such as accommodating interviewees' preferences, some interviews were conducted with multiple participants simultaneously. In these instances, several precautions were implemented to ensure the integrity of the data collection process. Care was taken to ensure that no significant power dynamics existed between the interviewees. Additionally, interview protocols were adjusted to ensure that each participant had equal opportunities to contribute, with the researcher taking on the role of a neutral facilitator to manage the flow of conversation and mitigate any potential bias. To further ensure that all perspectives were adequately captured, follow-up questions were tailored to elicit more detailed responses from participants who may have been less vocal during the discussion. Confidentiality and anonymity were also emphasised, with clear communication to participants about how their contributions would be used, ensuring a comfortable environment for open and honest dialogue.

Despite initial scepticism toward group interviews, I found that this format ultimately became a strength for several reasons. Group interviews served as an effective means of implementing snowball sampling, as there were instances where an individual I contacted responded by including others into the conversation and suggesting a group interview. Importantly, the participants themselves chose to be interviewed as a group; I neither organized nor proposed this format. Furthermore, the participants typically knew each other beforehand, which created a comfortable and collaborative dynamic that enriched the discussions.

Additionally, a small minority of the interviews were conducted in a written question-and-answer format, rather than the usual verbal, semi-structured approach, due to the participants' scheduling constraints and personal preferences. To accommodate their limited availability, the format was adjusted to be more direct and detailed, with questions crafted to elicit focused and comprehensive responses. This structured approach ensured that key topics were thoroughly addressed, despite the participants' inability to engage in real-time conversations. Although it lacked the flexibility of semi-structured interviews, this method allowed participants to carefully consider their answers and provide precise responses, ensuring that the quality and depth of the data were maintained.

Table 1: Interview Type Strengths and Weaknesses

Individuals Interviews	Group Interviews	Written Interviews
Strengths	**Strengths**	**Strengths**
Allows participants to express their thoughts freely without peer influence. A smooth and free-flowing discussion is ensured. Tailored questions elicit insights specific to each participant's distinct role and perspective. Builds rapport and trust, promoting candid communication. Mitigates hierarchical or power dynamics that might inhibit responses in group settings.	Effective for collaborative discussions. Can enrich data through interaction and collective brainstorming. Useful for snowball sampling, as participants sometimes introduced others to the study. Can foster a comfortable and collaborative dynamic.	Enabled the researcher to provide detailed, sequential questions, ensuring all specific topics were addressed without the risk of conversation redirection. Provides participants with the flexibility to respond at their convenience, accommodating scheduling constraints. Encourages precise and thoughtful responses due to the lack of time pressure. Offers a structured format that ensures all key topics are addressed.
Weaknesses	**Weaknesses**	**Weaknesses**
Time-intensive for both researcher and participants. Limits the possibility of discussions on shared perspectives among interviewees.	Risk of dominant participants overshadowing others, leading to less equitable contributions. Power dynamics or hierarchical differences may skew data quality.	Lacks the spontaneity and depth that follow-up questions in verbal interviews can provide. Misses out on non-verbal cues like tone and facial expressions. Limited opportunity to probe deeper into emergent themes or clarify ambiguous responses.

All in all, during Q3 and Q4 of 2024, 16 interviews were conducted, serving as the groundwork of primary data for this research. A diverse group of individuals was interviewed, providing a wide range of perspectives. Notably, significant differences in perceptions of administrative burdens and strategic priorities were highlighted by the contrasting viewpoints between researchers and high-level EU funding experts. Generally speaking, the need for streamlined application procedures and greater alignment between funding priorities and research goals was often emphasised by researchers, while insights into the complexities of compliance and strategic planning required to maximise Malta's involvement in EU programs were provided by individuals such as the Permanent Secretary responsible for EU Funding and the Pro-Rector of the University of Malta. Additionally, the importance of capacity-building and advocacy efforts was underscored by the perspectives of research support directorates, which offered a complementary view on how to enhance support for researchers. These diverse and sometimes contrasting insights have been instrumental in forming a comprehensive understanding of Malta's research funding landscape and will inform targeted recommendations for improvement.

Methodology for Data Analysis

The qualitative research method used for data analysis in this study is thematic analysis, which involves identifying, analysing, and categorising themes to uncover patterns within the data. Initially, themes were derived from the literature review, refined through interview questions, and adjusted based on participant responses. This approach helps categorise individual experiences and enhances the credibility of the findings by integrating empirical data (Braun and Clarke, 2006).

One of the key advantages of thematic analysis is its flexibility. It can be used across a range of theoretical and epistemological frameworks, making it adaptable to various research paradigms (Braun and Clarke, 2006). This theoretical freedom allows it to provide a rich and

detailed yet complex account of data (Braun and Clarke, 2006). However, to ensure that this flexibility does not lead to vague or unfocused results, it is essential to follow a clear framework and remain transparent about the analytical choices made (Braun and Clarke, 2006).

Braun and Clarke's (2006) six-phase guide to thematic analysis was applied to ensure rigor and clarity in this process. First, the researcher familiarised themselves with the data by reading and re-reading the transcripts, followed by generating initial codes based on significant ideas and concepts. Through analysing the transcripts, these codes were identified, and then organised into broader themes. These were then reviewed and refined to ensure they accurately represented the data. Each theme was defined clearly, highlighting its relevance to the research question.

This process of thematic analysis is inherently interpretive, often going beyond mere description to offer insights into various aspects of the research topic (Braun and Clarke, 2006). However, the method does not prescribe a rigid procedure for determining what constitutes a theme; rather, a theme is something that captures a significant aspect of the data related to the research question (Braun and Clarke, 2006). While prevalence can help determine a theme's importance, it is not solely defined by the frequency of occurrence but by its relevance and impact on the research objectives (Braun and Clarke, 2006). Therefore, ongoing reflexivity on the part of the researcher is critical throughout the analytical process to ensure that the chosen themes meaningfully represent the data (Braun and Clarke, 2006).

Ethical Considerations

The research instruments, including an information letter and consent form, were developed and approved by the Faculty Research Ethics Committee at the University of Malta prior to implementation. Ethical considerations were prioritised throughout the

research process, particularly during the consenting phase and interviews. Participation was entirely voluntary, with participants free to withdraw at any point without providing an explanation. All participants were fully informed about the potential benefits, risks, and the ultimate purpose of the study. Furthermore, any information that could reveal participants' identities was kept confidential, unless they explicitly consented otherwise. Given the non-invasive nature of the study, it was not anticipated that the data would have any harmful effects on participants. It was essential that the researcher accurately represented all views and opinions. Interviews were conducted either online or in comfortable, private settings such as quiet offices, ensuring an environment conducive to open and honest communication. Consent forms were thoroughly explained, emphasising participants' rights to stop the interview at any time, ask questions, or request data erasure. Confidentiality and the absence of personal gain were also underscored to build trust and transparency.

Limitations

In any research endeavour, acknowledging and addressing limitations is vital for ensuring the credibility and validity of the findings. Whilst the researcher remains confident that the decisions made and outlined previously are the best for the particularities of the study, it is essential to recognise the potential challenges and constraints. Understanding these limitations helps to contextualise the findings and offers insights into areas for improvement in future research.

Firstly, despite the strong advantages of utilising snowball sampling, several limitations need to be considered, particularly concerning selection bias and gatekeeping. Snowball sampling relies on initial participants to recommend subsequent ones, which can introduce selection bias. This method may lead to a sample skewed towards individuals with similar perspectives, backgrounds, or affiliations, potentially excluding less connected or

minority voices. As a result, the diversity and representativeness of the findings may be compromised.

In specialised or close-knit communities, key individuals or gatekeepers can significantly influence who is included in the study. This gatekeeping effect can shape the research sample, possibly skewing data and limiting the study's overall representativeness.

To address these limitations, it is crucial to be transparent about potential biases and actively work to mitigate them. In this study, efforts were made to expand the network by reaching out not only to individuals and organisations directly recommended by interviewees but also to those mentioned in passing. To further reduce bias, the snowball sampling process was initiated from multiple and varied sources within the research community. Additionally, setting specific criteria for recruiting new participants outside the initial network helped to broaden the demographic and professional diversity of the sample.

This study gathered valuable insights into the current state of research funding in Malta. However, certain perspectives may be underrepresented. While the participants had substantial experience in securing research funding, the findings might not fully reflect the views of those from smaller institutions or niche research areas. Efforts were made to engage individuals from both major research institutions in Malta, but responses from the Malta College of Arts, Science & Technology were particularly limited. Similarly, several NGOs and private companies known to have participated in research endeavours were contacted, yet responses from this sector were also notably sparse. Additionally, whilst doing the thematic analysis, and utilising a method of coding in order to accurately identify themes was deemed the most reliable form of analysis, one must also mention the possibility of a bias and misinterpretation since the researcher was the sole coder for the study.

Consequently, the findings may primarily reflect the perspectives of more established voices within the research community. Broadening the sample in future studies could capture a wider range of experiences and challenges, enriching the understanding of the research funding landscape.

Conclusion

In summary, this chapter establishes a solid foundation for the research endeavour through the integration of desk research and primary data collection methods. It delineates a methodical approach to research design, navigating key decisions to aptly meet the research objectives. The methodology was meticulously crafted to facilitate efficient data acquisition while providing participants with a platform to express their experiences openly during interview sessions. Subsequently, the ensuing chapter will present the data gleaned from this research, followed by an exhaustive thematic analysis of the findings.

Results

Overview

The Maltese research funding landscape, while a critical pillar for both academic and industrial advancement, is often viewed as a complex system of policies, bureaucracies, and funding mechanisms that require careful navigation. The aim of this study is to analyse these challenges and identify areas for improvement through an evidence-based approach. To achieve this, key stakeholders from academia, industry, and government were interviewed to provide firsthand insights into the strengths and weaknesses of Malta's research funding ecosystem.

In this section, most participants are anonymised to ensure confidentiality while preserving the clarity of their contributions. The interviews revealed a broad range of experiences, frustrations, and aspirations for the future of research in Malta. These discussions formed the foundation of this analysis, offering a comprehensive view of the current funding landscape, the challenges faced by researchers, the issues within the support infrastructure, and the complexity of academia-industry collaborations.

The interviews covered topics such as Malta's dependency on external funding sources, the internal administrative structures governing research, the relationship between national policies and academic output, and the role of collaboration between academia and the private sector in driving research innovation. The insights gained from these conversations are crucial to understanding how Malta can optimise its research funding systems to support sustainable and impactful research.

From these interviews, several elements emerged, including the state of research funding, the administrative and bureaucratic hurdles researchers face, the disincentives for participating in competitive grants, and the difficulties in fostering productive collaborations

between academia and industry. This section presents the study's findings, focusing on presenting a clear and objective report of the outcomes, without interpretation or discussion of their implications. In this writing, most participants are represented with a code, whilst a few other individuals, namely Prof Ing. Simon G Fabri and Mr Jonathan Vassallo are mentioned by name as their identity was not concealed due to their public position (as per annexes 2 and 4).

Table 2: Participants and their representative roles in this research

Participant 1	A Representative for the Research Support Services Directorate, University of Malta
Participant 2	A Representative for the Research Support Services Directorate, University of Malta
Participant 3	A Representative for the Research Support Services Directorate, University of Malta
Participant 4	A Researcher from the Malta College of Arts, Science & Technology
Participant 5	A Researcher from the University of Malta
Participant 6	A Representative from the Malta University Innovation Portfolio
Participant 7	A Representative for the Malta Chamber of Scientists
Participant 8	Prof Ing. Simon G Fabri, Pro-rector at the University of Malta
Participant 9	A Researcher from the Malta College of Arts, Science & Technology
Participant 10	A Researcher from the University of Malta
Participant 11	A Representative for the Malta Chamber for Commerce, Enterprise and Industry
Participant 12	A Representative for the Malta Chamber of Engineers
Participant 13	A Researcher from the University of Malta
Participant 14	A Representative for the Malta Chamber of SMEs
Participant 15	A Researcher from the University of Malta
Participant 16	Mr Jonathan Vassallo, Permanent Secretary (Funds), Ministry for The Economy, European Funds and Lands

Presentation of Key Findings

This chapter aims to start by providing a detailed outline of the topics discussed as well as the general outcomes of the research. Following, the themes identified will be presented, aiming to serve as the basis of the discussion chapter.

Current State of Research Funding in Malta

The current state of research funding in Malta reflects both the progress made since the country's accession to the European Union and the structural and financial limitations inherent to small island nations. While Malta's integration into the European research landscape has opened up opportunities for accessing EU research funds, the heavy reliance on these external sources has created gaps in national funding, which, in turn, has shaped the priorities and direction of research activities across the country.

Participant 1, a representative from the Research Support Services Directorate at the University of Malta, explained that the majority of research activities at the institution are reliant on external funding sources, particularly those provided by the European Union. The University of Malta, like many other European universities, taps into EU programs such as Horizon 2020 and Horizon Europe to fund research projects that range from scientific innovation to social sciences and humanities. This reliance on external funds has proven both a strength and a limitation.

From a positive perspective, EU membership has afforded Maltese researchers access to a vast pool of competitive funding opportunities. Prof Ing Simon Fabri, the pro-rector for research at the University of Malta, highlighted how EU funding has allowed the University of Malta to expand its research capabilities, particularly in science, engineering, and medicine. This expansion has not only enhanced the university's research output but has also

strengthened its collaborations with international partners, making it an integral part of Europe's research community.

However, Prof Ing Fabri also noted that while EU funding plays a crucial role in supporting Maltese research, the country's national funding infrastructure remains underdeveloped. The Maltese government allocates a relatively modest budget for research activities, with only 1.3 million euros in annual research funds available to the University of Malta for 2024. According to the participant, this amount is far from sufficient to support the full range of research activities required to position Malta as a leader in innovation. Although national funds are often awarded to research clusters and strategic areas of interest, the limited financial resources have led to a highly competitive environment in which only a small number of projects receive funding.

This competitive atmosphere, according to Prof Ing Fabri, has had both positive and negative consequences. On the one hand, the pressure to secure external funding has led to higher research standards and more innovative projects. On the other hand, the lack of consistent national funding has meant that researchers are often forced to align their research agendas with the priorities of external funding bodies rather than pursuing projects that address Malta's specific needs.

Participant 5, an academic and researcher within the University of Malta, with experience in securing both national and EU grants, echoed these concerns. He observed that the Maltese research funding ecosystem, while dynamic, suffers from a lack of long-term financial stability. The participant explained that many research projects, particularly those in the early stages of development, require sustained investment over several years. However, the reliance on short-term, competitive funding mechanisms means that researchers often face funding gaps that disrupt the continuity of their work. For example, once a grant ends,

researchers may struggle to secure additional funding, which can lead to a “start-stop” research cycle where momentum is lost, and valuable time is spent reapplying for new grants.

Adding to these challenges, Mr. Vassallo, Permanent Secretary for European Funds, emphasised that while EU funds are pivotal in driving research, the complexities associated with accessing these funds can be daunting for smaller institutions. He highlighted that Malta’s research initiatives are significantly influenced by the EU’s strategic objectives as outlined in the Partnership Agreement and Malta’s Smart Specialisation Strategy. These frameworks prioritise areas such as digitalisation, green technologies, and health. However, Mr. Vassallo noted that the rigid alignment to these broader EU priorities often compels local researchers to adjust their focus, potentially at the expense of addressing pressing local issues.

This issue of research continuity was a recurring theme throughout the interviews, disrupting progress on long-term projects. Both Participant 7, a representative from the Malta Chamber of Scientists, and Participant 13, a researcher at the University of Malta emphasised this issue, noting that inconsistent funding hinders meaningful research. Long-term projects, especially those involving extensive data collection or new technology development, require sustained support to produce impactful results. As Participant 13 highlighted:

> Substantial funding is allocated to large-scale projects [...] However, there's no requirement that the project must continue to function for a minimum of five years after the funding ends. This lack of a long-term operational guarantee is concerning [...] without assurance that these projects will be sustainable beyond the initial funding period, there's a risk that a lot of money might not lead to enduring benefits.

However, existing funding frameworks, such as the Xjenza Malta Research Excellence Programme, typically offers relatively short-term funding. While accessible, these limited durations restrict researchers to incremental advancements, reducing the attractiveness of

Maltese research projects for experienced scientists and stifling opportunities for in-depth exploration. This short-term focus on funding models ultimately limits Malta's potential for significant research contributions, highlighting the need for reforms prioritising long-term project support.

Participant 5 also highlighted the role of bureaucracy in exacerbating these funding challenges. He described how the complex administrative procedures associated with both national and EU grants can lead to delays in project implementation. For instance, the participant recounted an experience where his research team had to wait several months for approval to purchase essential equipment due to bureaucratic red tape. These delays, he argued, not only hinder the progress of individual projects but also discourage researchers from applying for grants in the first place.

Mr. Vassallo confirmed that Malta's limited capacity for innovation is partly due to the relatively low R&D intensity in businesses, which stood at only 0.33% of GDP in recent years. He suggested that enhancing the support mechanisms for early-stage and small-scale research projects could help mitigate this issue. Further consolidation of EU funding resources and a reduction in administrative burdens could also facilitate better access to these funds for local researchers.

The reliance on external funding has also influenced the types of research conducted in Malta. Participant 1, in general agreement with Prof Ing Fabri's sentiments explained that, because many EU grants are designed to address broad, pan-European challenges, researchers in Malta are often compelled to tailor their projects to fit these priorities. While this has led to valuable contributions to global research agendas, it has also meant that research projects that address local issues, such as environmental sustainability or public health in Malta, are often sidelined. The participant argued that a more robust national funding system would allow

researchers to focus on projects that are of direct relevance to Malta's needs, rather than having to align their work with the priorities of external funding bodies, stating:

> There is a lack of national support on research. There have been improvements but there is still much to do. When looking at R&I as a percentage of GDP, it's very low at 0.6%, when big countries in Europe are closer to 3% [...] There needs to be more budgetary commitment from the government.

The disparity between national and external funding was further highlighted by Participant 12, a representative from the Malta Chamber of Engineers. He observed that while EU funding has been crucial in supporting high-level research in Malta, the country's limited national funding has made it difficult to develop a strong research culture at the grassroots level. The participant explained that many smaller research projects, particularly those led by early-career researchers or those based in industry, do not meet the criteria for EU grants. As a result, these projects often go unfunded, which stifles innovation and prevents the development of new ideas that could potentially have a significant impact on Malta's economy and society.

One of the most significant findings from the interviews was the need for a more balanced funding system that integrates both national and external resources. Prof Ing Fabri argued that while Malta will continue to rely on EU funding for the foreseeable future, there is a pressing need for the government to increase its investment in research. The creation of a dedicated research ministry was suggested, one similar to those found in other EU countries. This could help to centralise and streamline the allocation of research funds, providing researchers with more consistent financial support and aligning national research priorities with Malta's long-term strategic goals.

Administrative Challenges and Support Structures

A strongly consistent theme across all the interviews was the issue of administrative burdens and the inadequacies of current support structures for researchers in Malta. Mr. Vassallo, Permanent Secretary for European Funds acknowledged that one of the significant obstacles Maltese researchers face in accessing EU funds is the complexity of the application and reporting processes. He noted that the extensive documentation requirements and compliance checks can be particularly daunting for smaller institutions and researchers who lack the administrative resources to manage these complexities. Mr. Vassallo emphasised that simplifying funding mechanisms and reducing bureaucratic hurdles would be essential to improving efficiency. Additionally, he highlighted the need for capacity-building initiatives to better prepare institutions for navigating EU funding opportunities, suggesting that enhanced support structures could alleviate some of the administrative burdens currently shouldered by researchers.

While research support services and project management entities exist to assist academic researchers in navigating the complexities of funding applications and project administration, many of the participants expressed frustration with the inefficiency and lack of capacity within these systems. A recuring issue, as highlighted by representatives from various Chambers in Malta, is the extensive administrative burden, especially for SMEs and researchers with limited support. Both participants 7 and 14, having good knowledge of SME's needs and obstacles highlighted the complexity in applications, noting that SMEs particularly struggle due to lack of dedicated administrative staff, making the process time-intensive and often deterring participation in research funding.

Participant 7 addressed the issue of short-term research staff contracts, which create instability and disrupt project continuity. High turnover means that each new hire requires training, which can compromise consistency and deter researchers from committing to long-

term projects in Malta. Moreover, participant 7 highlighted the limitations of current funding structures, which lack provisions for the maintenance and calibration of specialised equipment essential for accurate research outcomes, explaining:

> One of the issues we highlighted was on maintenance agreements for equipment […] It's useless just buying equipment that is state of the art. We spent money for it, we have training, we have funds for it, but we don't have the funds to maintain it. [...] You need a set amount of money per year, to maintain the equipment, calibrate it, etc., so as to keep it in a working order, and to make sure it lasts.

Without dedicated funds for these purposes, research teams are forced to reallocate resources, adding administrative strain and impacting project progress. Participant 7 argued that addressing these gaps would enhance both the quality and efficiency of research.

Similarly, Participant 14 focused on the financial and administrative barriers that deter SMEs from engaging with Malta's research funding system. A key issue he identified is the lack of pre-financing options, which requires SMEs to bear project costs upfront before being reimbursed. This strain on cash flow discourages smaller companies from pursuing research, as they often prioritise financially viable projects with more predictable outcomes. The participant also noted that while the Chamber of SMEs provides initial advisory support to help businesses identify potential grants, it lacks the resources for in-depth application assistance. The complexity and time commitment involved in the application process can be overwhelming for SMEs without dedicated administrative teams, which often deters them from pursuing available funding opportunities. Participant 14 emphasised that providing additional support, especially during the application phase, would be beneficial in encouraging greater participation from smaller businesses in Malta's research ecosystem.

From the academic sphere, participant 5, who briefly explained his complex involvement in multiple research projects, explained that while the University of Malta has established the Project Support Office (PSO) to assist researchers, the office is often understaffed and overwhelmed by the volume of research activities. The participant noted that the PSO is responsible for supporting not only national projects but also EU-funded initiatives, which require extensive financial reporting, procurement documentation, and administrative oversight. This workload, he argued, places a significant burden on the PSO, making it difficult for them to provide the level of support needed for large, complex projects. Participant 5 emphasised that the country's research support infrastructure, although improving, still lacks sufficient depth. Project support officers provide only basic assistance, mainly focused on surface-level proposal edits rather than in-depth technical evaluation, which leaves researchers to manage a significant portion of the bureaucratic workload on their own. This administrative burden detracts from their primary research responsibilities, reducing overall productivity.

The participant recounted several instances where the research team experienced delays due to the administrative bottlenecks within the PSO. For example, one project required the purchase of specialised laboratory equipment. However, the procurement process, which required multiple rounds of approval and the submission of three separate quotations from suppliers, took several months to complete. During this time, the research team was unable to proceed with their experiments, which ultimately delayed the entire project. Reflecting on these challenges, the participant noted:

> For instance, when an order is placed, payment must be processed before the supplier provides the required materials. This involves extensive internal procedures that are time-consuming. Consequently, meeting deadlines becomes highly challenging, particularly within tight project timeframes of 12 to 18 months.

The participant explained that such delays are not uncommon in Malta's research environment and are often caused by the rigid procurement rules imposed by national funding agencies and EU programs.

Participant 6, a representative of the Malta University Innovation Portfolio, echoed these concerns, describing how his office is often inundated with administrative tasks that take time away from more strategic activities, such as supporting the commercialisation of research. He explained that while the office is responsible for helping academics negotiate research agreements, manage intellectual property, and identify potential industry partners, much of their time is spent dealing with bureaucratic paperwork. This includes submitting financial reports, managing procurement processes, and ensuring compliance with funding requirements.

The participant explained that one of the key issues is the lack of specialised administrative support staff who are trained to handle the specific challenges of research project management. Whilst many researchers are experts in their respective fields, they often lack the administrative skills needed to manage the day-to-day operations of a research project. This results in a situation where academics are forced to take on multiple roles, from project manager to financial administrator, which not only detracts from their ability to conduct research but also leads to inefficiencies in project execution.

The problem of administrative overload was also highlighted by Participant 13, who has been involved in several large-scale EU-funded projects. He described how the reporting requirements for these projects are often excessively demanding, with financial claims due every four to six months and detailed post-project reports required at the end of each grant. The participant explained that these reporting obligations place a significant strain on research teams, particularly those with limited administrative support. In many cases, the

responsibility for compiling these reports falls on the academic lead, who must balance this administrative workload with their research and teaching duties.

Participant 3 provided additional insights into the administrative challenges faced by researchers in Malta. He explained that the country's small size means that there is a limited pool of experienced research support officers (RSOs) who can assist with the management of large projects. Many of the RSOs hired to assist with EU-funded projects are employed on short-term contracts, and once these contracts expire, the expertise they have gained is often lost. This creates a cycle of continuous recruitment and retraining, which hinders the ability of research teams to maintain continuity and complete projects on time.

The participant recounted an experience where his research team faced significant delays due to the inability to recruit a suitable RSO in time. The project, which was funded by an EU program, required extensive financial reporting and compliance with complex procurement rules. However, the team was unable to hire an RSO with the necessary skills, which meant that the academic lead had to take on these administrative duties. As a result, the project fell behind schedule, and several deliverables were delayed.

This issue of human resource turnover was also discussed by Participant 2, who emphasised the importance of retaining experienced RSOs in order to ensure the smooth running of research projects. He explained that while the University of Malta and other institutions have made efforts to improve their support structures, there is still a lack of long-term planning when it comes to staffing. The participant suggested that one solution to this problem would be to offer longer-term contracts to RSOs, which would allow them to build up expertise over time and provide more consistent support to research teams.

The administrative challenges faced by researchers in Malta are further compounded by the country's rigid procurement rules, which often slow down the progress of research

projects. Participant 5 described how the requirement to obtain three separate quotations for every purchase, no matter how small, creates unnecessary delays in the procurement process. He argued that while these rules are designed to ensure transparency and accountability, they are often applied in a way that is overly bureaucratic and ill-suited to the fast-paced nature of research. For example, the participant recounted an incident where his team needed to purchase a roll-up banner for a research event. The cost of the banner was only 150 euros, but the procurement rules required the team to obtain three separate quotations from suppliers. This process took several weeks, during which time the event had already passed. The participant argued that such rules are overly burdensome for small, low-cost purchases and suggested that a more flexible approach to procurement could help to alleviate some of the administrative burden on researchers.

Participant 6 also discussed the challenges of complying with EU procurement rules, which are often more stringent than those imposed by national funding agencies. He explained that while these rules are designed to ensure the proper use of public funds, they can be difficult to navigate for researchers who are not familiar with the complexities of procurement law. This can lead to delays in project implementation, as researchers must spend time ensuring that their procurement processes are fully compliant with EU regulations.

The issue of compliance with EU rules was further highlighted by Participant 13, who argued that while financial accountability is important, the current system places an excessive burden on researchers, particularly those who are managing multiple projects at once. It was suggested that one way to alleviate this burden would be to adopt a more flexible approach to financial reporting, similar to the “lump sum” system used in some Horizon Europe programs. Under this system, researchers are awarded a lump sum of money at the start of the project, and they are not required to submit detailed financial reports until the end of the grant

period. This, he argued, would reduce the administrative workload on researchers and allow them to focus more on their research activities.

Researcher Motivations and Disincentives

The interviews revealed several key factors that influence the level of engagement and motivation among researchers in Malta. Despite the dedication and expertise of the academic community, several participants emphasised that the current research funding environment does little to encourage long-term commitment, particularly among early-career researchers and those working in non-traditional academic fields. The main factors disincentivising researchers from engaging with Malta's research funding systems can be broken down into issues of career progression, time constraints, job security, and administrative burden.

Participant 4, a researcher at the Malta College for Art Science and Technology, provided a candid account of how the lack of tangible career progression opportunities diminishes the motivation to participate in competitive grant schemes. The participant explained that the internal reward structures for academic staff are heavily skewed toward teaching and first-authored publications. This has led to a situation where participation in collaborative or multi-disciplinary projects is viewed as less valuable since these projects often do not translate directly into first-author publications, which are crucial for career advancement. Participant 4 explained that this disconnect between the type of research being funded and the institutional rewards structure serves as a major disincentive, especially for mid-career academics who are looking to advance within the system.

Participant 10, a professor at the University of Malta, corroborated this perspective by describing how many lecturers feel that they are not sufficiently rewarded for their contributions to research projects. In particular, it was pointed out that while students and junior researchers benefit from exposure to new methodologies and developments in their

field, senior researchers are often left feeling overburdened by the administrative demands of managing a research project without any significant career benefits. This results in a situation where many senior researchers are reluctant to take on the added responsibilities of project management, which ultimately limits the scope of research projects that Malta can pursue.

Another major issue raised by the participants is the unpredictability and time-consuming nature of the competitive grant process. Participant 9, an experienced researcher at the Malta College of Arts, Science & Technology who has secured multiple grants, described how the time and effort required to prepare a competitive grant proposal can be overwhelming, especially when there is no guarantee of success. The participant recounted how many researchers invest months of their time writing and refining grant proposals, only to have their applications rejected. This uncertainty, as the participant explained, is a significant source of stress for researchers, particularly those who rely on project-based funding to support their work.

Mr. Vassallo further elaborated on this issue by noting that the administrative complexities associated with accessing EU funding can serve as a significant disincentive for researchers, particularly early-career academics who may lack experience in navigating the intricate processes required for grant applications. He emphasised that the time-consuming nature of these administrative tasks often diverts researchers' focus away from their core research activities, thereby reducing their motivation to pursue grant opportunities in the first place. Streamlining these processes and providing targeted support could enhance researchers' willingness to engage with available funding programs, particularly those focused on long-term, impactful research.

Participant 9 further explained that the unpredictability of the grant process also has a direct impact on the quality of research produced. The time constraints imposed by grant

deadlines often force researchers to rush through the planning and execution phases of their projects, which can lead to suboptimal outcomes. Additionally, the short-term nature of most grants means that researchers are often unable to explore more complex or high-risk projects that require sustained investment over several years. Instead, they are incentivised to pursue "safer" projects that can be completed within the funding period but may not contribute significantly to the advancement of knowledge in their field.

Job security emerged as another key issue that discourages researchers from fully committing to the grant application process. Participant 10 explained that many researchers in Malta, particularly those on fixed-term contracts, are reluctant to apply for grants because they fear that they will not be able to secure long-term employment once the project ends. This is particularly true for early-career researchers and postdoctoral fellows, who often find themselves in a precarious position once their contracts expire. The participant described how the uncertainty surrounding contract renewals and the lack of permanent positions in academia has led to a "brain drain," with many talented researchers leaving Malta to pursue opportunities abroad where job security is more assured.

Participant 5 expanded on the theme of job insecurity by highlighting the challenges faced by research teams in recruiting and retaining skilled staff. He explained that many research projects in Malta are hampered by the high turnover of staff, particularly research assistants and technicians, who are often employed on short-term contracts tied to specific projects. Once these contracts expire, research teams are forced to recruit new staff, which not only leads to delays in project implementation but also results in a loss of institutional knowledge. This issue is further compounded by the fact that many of the administrative and technical staff involved in research projects are not afforded the same job security as academic staff, which contributes to a lack of continuity in project execution.

The issue of time constraints was also a highly relevant theme in the interviews. Several participants discussed how the demands of research projects, combined with teaching and administrative responsibilities, leave little time for researchers to focus on their core academic interests. Participant 9 described how her involvement in multiple projects simultaneously left her with little time to devote to her primary area of research. This, as explained, is a common issue for many researchers in Malta, who often find themselves juggling multiple roles, from lecturer to project manager to administrator.

Participant 5 described how the administrative workload associated with research projects often leaves researchers feeling overwhelmed and unable to devote sufficient time to their research activities. The participant recounted how, during a particularly busy period, he was managing several overlapping grants, each of which required extensive financial reporting and procurement documentation. As the participant explained,

> The problem is, at least for the projects I am involved in, the timelines are very rigid. Internally, the administrative process is quite time-consuming [...] This year, we encountered a situation where different types of funding were running concurrently, creating significant challenges. A similar issue arose last year while I was managing two different grants simultaneously. I managed because I worked much harder than I should have.

Such a situation was described as possibly hindering time for actual research, ultimately affecting the quality of the project outcomes. The participant argued that the current funding system, which places such a heavy emphasis on financial accountability and administrative compliance, detracts from the primary goal of research: generating new knowledge and insights.

Another disincentive for researchers, according to Participant 6, is the lack of support for interdisciplinary and collaborative research. While many funding bodies, particularly

those at the EU level, encourage collaboration across disciplines and institutions, the structures in place in Malta often make it difficult for researchers to engage in such projects. For example, Participant 6 explained that interdisciplinary research projects often require a higher level of administrative coordination, as they involve multiple faculties and departments. However, the lack of centralised support for such projects means that much of the administrative burden falls on the researchers themselves, which can be a significant deterrent.

Prof Ing Fabri also pointed out that the fragmented nature of Malta's research funding system makes it difficult for researchers to pursue interdisciplinary projects. He explained that many of the available grants are highly specialised and tied to specific fields, which limits the opportunities for researchers to engage in cross-disciplinary work. This, he argued, is a missed opportunity, as many of the most pressing global challenges, such as climate change and public health, require interdisciplinary approaches that draw on expertise from multiple fields.

Industry Collaboration and Commercialisation

A persistent challenge identified in the interviews was the difficulty in fostering effective collaboration between academia and industry in Malta. While both sectors stand to benefit from closer ties, participants highlighted several obstacles preventing the full realisation of such partnerships, including misalignment between academic and industry research priorities, reluctance from private companies to engage in early-stage research, and insufficient incentives for academics to pursue commercialisation.

Participant 2, explained that one of the main barriers to industry collaboration is the misalignment between the research priorities of academia and the needs of industry. Many of the projects that receive funding through national and EU programs are focused on

fundamental research, particularly in fields such as science, technology, and engineering. However, these projects are often of limited interest to industry partners, who are typically more focused on applied research and product development. This disconnect, according to Participant 2, creates a situation where academia is pursuing research that is not directly relevant to the needs of the private sector, which limits the potential for collaboration.

Participants also discussed the need for funding reforms to better support industry collaboration and commercialisation. Programs like the FUSION initiative currently prioritise commercial applications over exploratory research, emphasising projects with immediate market potential over "blue-sky" research. Participant 11, being a representative of the Malta Chamber for Commerce, Enterprise and Industry advocated for a more balanced approach, recommending a distinct allocation of funds for both foundational and commercial R&D, which could diversify Malta's research landscape and provide a stronger innovation base.

Mr. Vassallo emphasised that fostering industry collaboration is critical for driving Malta towards an innovation-led economy. He noted that aligning funding initiatives with the country's Smart Specialisation Strategy could incentivise collaboration between academia and industry by focusing on high-growth sectors like digitalisation, green technologies, and health. According to Mr. Vassallo, targeted support for industry-led projects and investments in research infrastructure could bridge the gap between academic research and industry needs, thereby facilitating commercialisation and enhancing the impact of research outputs.

Additionally, Participant 11 and Participant 12 emphasised the need for more industry-led funding schemes, where academia plays a supporting role, as this shift could produce research outcomes more applicable to industry needs.

Participant 3, expanded on this point by explaining that many industry partners are hesitant to engage in early-stage research because of the inherent risks involved. He

recounted several instances where his office had attempted to facilitate partnerships between academic researchers and private companies, only to have the companies back out due to concerns over the feasibility and commercial viability of the research. This reluctance, he explained, is particularly pronounced when it comes to projects that are at low Technology Readiness Levels (TRLs), where the research is still in its early stages and has not yet been proven in a practical setting.

Participant 6 provided an example of a promising research project in the field of renewable energy, where the university had developed a new technology that showed potential for commercialisation. However, despite initial interest from several companies, none of them were willing to commit to taking the technology to market. The participant explained that the companies wanted the university to conduct further testing and validation before they would consider investing in the project. However, the university did not have the funds to carry out the additional research, and as a result, the project stalled. This, he argued, is a common issue in Malta's research ecosystem, where the lack of funding for late-stage research and development creates a gap between academic innovation and industry commercialisation.

Participant 13, referring to involvements in industry-academia collaborations, echoed these concerns, noting that many of Malta's industries do not have the capacity or the resources to engage in research and development. He explained that most of the country's industries are small and focused on manufacturing, which means that they do not have dedicated R&D departments. This lack of industry involvement in research, he argued, limits the opportunities for academic researchers to collaborate with private companies and bring their innovations to market. The participant suggested that one way to address this issue would be for the government to provide incentives for companies to invest in R&D, particularly in high-growth sectors such as renewable energy and information technology.

Participant 12 added that the funding structures in place do not always support industry collaboration. He explained that many of the available grants, particularly those from EU programs, require an industrial partner. However, finding a suitable partner can be difficult, especially for projects that are in the early stages of development. The participant suggested that Malta's funding bodies should consider creating more flexible funding schemes that allow for academic-industry collaboration at different stages of the research process, rather than requiring industry involvement from the outset.

The issue of commercialisation was another major theme in the interviews. Participant 6, whose office is responsible for helping academics protect their intellectual property and bring their innovations to market, explained that while there is growing interest in commercialisation, many academics are reluctant to pursue it. He argued that the main reason for this reluctance is the lack of incentives for academics to engage in commercialisation. While universities in other countries often provide financial rewards or career advancement opportunities for academics who successfully commercialise their research, this is not the case in Malta. As a result, many academics prefer to focus on publishing research papers, which are more highly valued in terms of career progression.

Participant 6 provided further insight into the challenges of commercialisation in Malta. It was explained that the Malta University Innovation Portfolio was established to support the commercialisation of research, the office is often under-resourced and unable to provide the level of support needed for large-scale commercialisation efforts. The participant recounted how several promising technologies developed at the university had failed to reach the market due to a lack of funding for further development and testing. He argued that while Malta has made significant progress in promoting R&I, there is still a long way to go in terms of translating academic research into commercial products.

The participants also highlighted the role of the government in fostering industry-academia collaboration and commercialisation. Participant 12 suggested that the government should provide more targeted funding for late-stage research and development, which would help to bridge the gap between academic research and industry commercialisation. He argued that whilst there are several funding programs available for early-stage research, there is a lack of support for projects that are ready to move into the commercialisation phase. This, as explained, is a major barrier to innovation in Malta, as many promising research projects are unable to reach the market due to a lack of funding and industry involvement.

In addition to funding, several participants suggested that the government could play a more active role in promoting collaboration between academia and industry. Participant 8, for example, argued that the government should establish a national innovation council that brings together representatives from academia, industry, and government to discuss research priorities and identify opportunities for collaboration. Such a council could help to ensure that research projects are aligned with the needs of industry and that the private sector is more involved in the research process from the outset.

Additionally, Participant 7 advocated for a shift towards industry-led funding programs, where companies approach researchers to initiate collaborations. It was argued that, while academia typically drives research, a more industry-led approach would bridge the gap between research and practical applications, enhancing research and development outcomes through direct industry involvement. This shift, as suggested, could help create a research environment where projects are more aligned with industry needs, facilitating faster commercialisation and a stronger impact on Malta’s innovation landscape.

Funding Accessibility and Bureaucratic Barriers

The accessibility of research funding in Malta, particularly in relation to the bureaucratic hurdles that researchers face, was another prominent theme in the interviews. While participants acknowledged the importance of financial accountability and transparency in the allocation of public funds, many expressed frustration with the cumbersome administrative processes that often accompany grant applications and project management. The participants highlighted several key issues related to funding accessibility, including the complexity of the application process, the rigid eligibility criteria, and the excessive reporting requirements.

Participant 1, a senior administrator at the University of Malta, described how the application process for research grants, particularly those from EU programs, can be daunting for many researchers, especially those who are new to the system. The participant explained that the amount of paperwork required to apply for a grant is often overwhelming, and the eligibility criteria can be difficult to navigate. For example, many EU grants require researchers to partner with institutions from multiple countries, which can be a challenge for smaller research teams that do not have established international networks.

Mr. Vassallo emphasised that one of the main barriers to accessing EU research funds is the fragmented nature of the funding programs and the extensive administrative requirements involved. He argued that consolidating these funding mechanisms and providing clearer guidance to applicants could significantly improve accessibility. Additionally, Mr. Vassallo suggested that capacity-building initiatives focused on simplifying the funding processes and reducing the administrative burden would empower smaller institutions and researchers who may not have the resources to navigate the complexities of current systems.

Participant 3, echoed these concerns, describing how the complexity of the application process often deters researchers from applying for grants in the first place. The participant recounted how the research team had spent months preparing an application for an EU-funded project, only to be rejected due to a minor technicality related to the eligibility criteria. The participant explained that such experiences are not uncommon in Malta's research community, and they often leave researchers feeling discouraged and disillusioned with the funding system.

One of the main barriers to funding accessibility, according to Participant 7, is the rigid eligibility criteria imposed by many funding bodies. He explained that while these criteria are designed to ensure that public funds are allocated to high-quality research projects, they often exclude researchers who do not meet specific requirements, such as having a dedicated research team or partnering with an academic institution. This, was argued to be a particularly problematic aspect for SMEs, which may have innovative ideas but lack the resources to meet the stringent eligibility criteria.

Participant 10 expanded on this point by discussing the issue of pre-financing, a common requirement in many grant schemes. The participant explained that under the current system, researchers are often required to cover the initial costs of a project out of their own pockets and then seek reimbursement from the funding agency. This can create significant financial strain, particularly for smaller research teams and early-career researchers who may not have the financial resources to front the costs of a project. The participant argued that this requirement often acts as a barrier to entry for many researchers, particularly those from disadvantaged backgrounds or underfunded institutions.

The issue of pre-financing was also raised by Participant 13, who explained that many research teams in Malta are unable to participate in large-scale EU projects due to the

financial risks involved. He described how his team had applied for a Horizon Europe grant but ultimately decided to withdraw from the project because they could not afford the upfront costs.

In this regard, participant 11 believes that separating ‘blue sky’ R&D from commercial R&D would allow for different levels of support and more appropriate disbursement methods. It was argued that in commercial R&D, it’s important to provide greater support at the beginning of the project, whereas blue sky research often relies on existing facilities provided by research institutions like universities. In such cases, the main investment from the researcher is their time, unlike in businesses, where the initial capital costs must be covered by the business itself.

Participant 3, provided further insight into the challenges of managing research funds once they have been awarded. He explained that the excessive reporting requirements imposed by many funding bodies, particularly those at the EU level, create significant administrative burdens for researchers. For example, many EU-funded projects require detailed financial reports every four to six months, which include itemised lists of all expenditures, receipts, and invoices. The participant explained that compiling these reports is time-consuming and often requires researchers to chase down suppliers for missing documentation, which can lead to delays in project implementation.

Participant 15 expanded on this point by describing how the reporting requirements for some grants are overly bureaucratic and not always aligned with the realities of research. He explained that many research projects, particularly those in the early stages of development, do not follow a linear path, and unexpected challenges often arise. However, the current reporting system requires researchers to adhere to strict timelines and milestones, which can be difficult to achieve when dealing with complex, unpredictable research topics.

The participant argued that a more flexible approach to reporting, which allows for deviations from the original project plan, would help to alleviate some of the administrative burdens on researchers and ensure that projects are completed to a high standard.

The participants also discussed the issue of financial accountability, particularly in relation to the procurement rules imposed by both national and EU funding bodies. Participant 5 described how the requirement to obtain three separate quotations for every purchase, regardless of the amount, creates unnecessary delays in the procurement process. The participant recounted an experience where his research team needed to purchase a piece of equipment for a project, but the procurement process took several months to complete due to the need to obtain multiple quotes. This delay, he explained, not only hindered the progress of the project but also led to frustration among the research team, who were unable to proceed with their work until the equipment was purchased.

Participant 13 provided a similar example, describing how his team had been forced to delay the start of a project because they were unable to secure the necessary equipment in time. He explained that while the procurement rules are designed to ensure transparency and prevent fraud, they often have the unintended consequence of slowing down the research process. The participant argued that a more streamlined procurement system, particularly for small, low-cost purchases, would help to reduce delays and ensure that projects are able to proceed on schedule.

Emerging Themes and Recommendations

The interviews with key stakeholders in Malta's research funding system brought to light several important themes and suggestions for improvement. In this regard, the below thematics were selected as the most significant discussion areas.

1. **National vs. External Research Funding (theme 1)**: Malta's heavy reliance on EU funding has shaped the research landscape, highlighting gaps in national funding. The lack of robust national funding forces researchers to align with external priorities rather than addressing local needs.

2. **Administrative and Bureaucratic Barriers (theme 2)**: The complex administrative processes, extensive reporting requirements, and rigid procurement rules hinder research progress. These burdens affect both academic institutions and SMEs, leading to delays and discouraging engagement in funding applications.

3. **Short-Term Funding and Project Continuity (theme 3)**: The reliance on short-term grants disrupts the continuity of long-term research projects. Limited national funding availability, coupled with short-term contracts, leads to project fragmentation and a lack of stability in research teams.

4. **Industry Collaboration and Commercialisation (theme 4)**: Misalignment between academic research goals and industry needs, along with insufficient incentives for commercialisation, hampers collaboration. There are calls for more industry-led funding and government support to bridge the gap between research and market applications.

5. **Researcher Motivation and Disincentives (theme 5)**: Issues like job insecurity, limited career progression, and the administrative burden discourage researchers, especially early-career academics, from engaging fully in Malta's research ecosystem. The focus on first-author publications over collaborative projects further exacerbates this issue.

Conclusion

The results of this extensive analysis reveal both the strengths and limitations of Malta's current research funding system. The participants' insights highlight the progress Malta has made in integrating into the European research landscape and leveraging EU

funding, but they also underscore the pressing need for a more balanced, sustainable, and strategic approach to research funding that reflects Malta's unique needs and challenges.

The participants provided a number of actionable recommendations to address these issues. These include the establishment of more robust administrative support structures, the introduction of longer-term funding cycles, the creation of an interdisciplinary research centre, and the promotion of international collaborations. Additionally, there is a clear call for the government to play a more active role in shaping Malta's research ecosystem, both through policy reforms and increased investment in research infrastructure and human capital.

The interviews also highlighted the critical role that R&I play in driving national growth. By aligning research efforts with Malta's broader economic and social development strategy, particularly in sectors such as green energy, digital innovation, and healthcare, Malta can ensure that its research ecosystem contributes to the country's long-term prosperity.

Finally, the overarching takeaway from this analysis is the recognition that research is not merely an academic pursuit; it is a foundational pillar of national progress and development. By investing in research, fostering collaboration, and creating a supportive ecosystem that values innovation, Malta can continue to build on its strengths and position itself as a leader in global R&I.

To achieve this, all stakeholders—academia, industry, government, and society—must work together to ensure that Malta's research funding system is optimised to meet the needs of the future. By implementing the recommendations outlined in this analysis, Malta has the opportunity to create a research ecosystem that is not only competitive on the global stage but also deeply responsive to the specific needs of the Maltese people and the challenges they face.

The future of Malta's research ecosystem will depend on a sustained commitment to funding, collaboration, and innovation, with the recognition that research is a long-term investment in the future prosperity and well-being of the nation.

Discussion

Overview

In the modern global economy, the ability for a country to remain competitive and drive sustainable economic growth is increasingly tied to its capacity for R&I (Maradana et al., 2017). Countries that successfully invest in research see substantial long-term benefits, including advances in technology, healthcare, and environmental sustainability, as well as improvements in social welfare and productivity (Maradana et al., 2017). For small nations like Malta, the role of research is particularly crucial, as it offers an opportunity to diversify the economy, create high-value jobs, and address pressing national challenges such as energy dependency, public health, and climate change. Despite these potential benefits, Malta's research ecosystem faces a number of significant challenges, particularly related to funding structures, research capacity, and administrative inefficiencies (Malta Council for Science and Technology, 2024b). These factors create instability, limiting the ability of researchers to pursue ambitious, long-term projects that could yield significant scientific and societal benefits. Additionally, the administrative burden placed on academics, the lack of advanced research infrastructure, and the relatively low level of industry engagement in research further exacerbate these challenges.

The purpose of this discussion is to critically examine the current state of Malta's research funding system through the information gathered from the interviews conducted and offer actionable recommendations for its improvement. Furthermore, this discussion will explore how Malta can address specific challenges related to administrative support, research infrastructure, industry collaboration, and international partnerships, while also emphasising the importance of an ethical research practices, and the role of education in fostering a research-oriented economy.

This chapter will be structured according to the themes identified following the thematic analysis conducted and outlined in the previous section. By addressing these key areas, Malta can create a more sustainable and impactful research ecosystem that not only enhances the country's global competitiveness but also contributes to addressing the most pressing challenges of the 21st century. Research is not merely an academic pursuit, it is a national imperative that drives technological advancement, economic resilience, and societal well-being. In recognising the critical role of research in shaping Malta's future, this discussion aims to provide a roadmap for strengthening the country's research funding system and ensuring that it becomes a cornerstone of national development.

Theme 1 - National vs. External Research Funding

Malta's research landscape is heavily shaped by its reliance on European Union funding due to the limited availability of national research grants (National Statistics Office, 2024). The stakeholders interviewed for this study underscored the significant impact of this reliance, which forces local researchers to align their projects with EU priorities rather than focusing on national or localised challenges. This dependence is largely due to the fact that Malta lacks a robust, well-funded national research framework, which constrains researchers to seek external funding sources. This trend has implications for the strategic autonomy of the country's research agenda, often skewing it towards areas that align with the EU's funding priorities, which may not necessarily correspond with Malta's specific socio-economic or environmental needs. This finding aligns with the literature's emphasis on Malta's dependency on EU funding, which has been identified as a key barrier to addressing national needs effectively (Schembri, 2022). However, the findings of this study add to this understanding by highlighting how stakeholders perceive this reliance as a driver of misaligned research priorities.

Malta's National Research and Innovation Strategic Plan 2023-2027 aims to embed R&I at the heart of the nation's economic and social framework by fostering a knowledge-based, value-driven growth model (Malta Council for Science and Technology, 2024b). The strategy prioritises investments in green and digital transitions, aligning research efforts with sustainability and digitalisation goals to support the EU's Green Deal and Digital Compass initiatives (Malta Council for Science and Technology, 2024b). It emphasises strengthening governance structures, fostering public-private partnerships, and enhancing collaboration between academia, industry, and government to drive commercialisation and applied research (Malta Council for Science and Technology, 2024b). Additionally, it focuses on bolstering local research capabilities and infrastructure to enhance international competitiveness, ultimately positioning R&I as a key driver of Malta's sustainable development (Malta Council for Science and Technology, 2024b).

Nevertheless, one of the recurrent themes from the interviews was the need for stronger investment in locally relevant research, the country could better align scientific endeavours with national policy priorities, such as environmental sustainability, public health, and economic diversification. This approach would not only enhance the relevance of research outputs but also reduce the overreliance on external funding sources, which may not always be available in the future. Given this context, it may be worth considering that, while the strategic policy framework is sound, there appears to be an opportunity to address fragmentation in the practical implementation of these policies. This resonates with the literature on the fragmented nature of Malta's research and innovation systems (Malta Council for Science and Technology, 2024b). By fostering better coordination, streamlining funding mechanisms, and enhancing support structures, Malta could more effectively translate its strategic R&I objectives into tangible outcomes. Strengthening these practical

aspects might help ensure that the ambitious goals outlined in the strategy are fully realised, supporting long-term sustainable growth and innovation.

Stakeholders suggested that national funding should prioritise interdisciplinary research projects that address Malta's unique challenges. By doing so, researchers would be incentivised to collaborate on complex, multi-faceted problems, such as coastal erosion or the sustainable management of limited freshwater resources. This suggests that interdisciplinary collaborations, supported by stable funding, are crucial for aligning research with national policy priorities. This perspective emphasizes the importance of shifting the focus from merely securing funds to fostering research with tangible local impact, particularly by addressing Malta's unique challenges through targeted investments, as highlighted in the literature review (Schembri, 2022). To achieve this, it is crucial for the government to provide stable, long-term funding mechanisms that allow research teams to develop sustained projects rather than short-term, fragmented efforts driven by external deadlines.

Another issue repeatedly raised during the interviews is the administrative complexity involved in applying for EU funding. One of the advantages of EU funding is the access it provides to larger amounts of funding and the increased likelihood of fostering collaborations, which often lead to more ambitious, large-scale projects. However, navigating the stringent requirements of EU programs can be overwhelming, particularly for smaller institutions and early-career researchers who may not have the resources to manage these administrative burdens. As a result, these researchers often find themselves at a disadvantage, unable to compete effectively with more established entities that have dedicated support teams.

By bolstering the national funding system, there is potential to relieve some of this pressure and create a more inclusive funding landscape. A stronger national funding

infrastructure could also make international research opportunities more accessible to early-career researchers by providing them with the foundational support needed to participate in collaborative projects. This could help to bridge the gap between established and emerging researchers, enabling a wider range of Maltese academics to engage in impactful international research initiatives without being deterred by the complexity of EU grant applications. This builds on the literature's identification of Malta's limited capacity to compete effectively in EU funding programs (European Commission, 2021).

Investing in national funding not only addresses these structural issues but also serves to build capacity and expertise within Malta's research community. By fostering a more balanced funding ecosystem, the country can encourage young researchers to remain in Malta, reducing the brain drain that occurs when talented individuals seek opportunities in better-funded environments abroad. Stakeholders emphasised that enhancing national research funding would also improve Malta's ability to participate in international collaborations as a leading partner rather than just a supporting contributor. Currently, Malta's participation in EU projects is often limited to ancillary roles due to the country's lack of experience in managing large-scale projects, which is partly a consequence of insufficient national funding experience.

Ultimately, a dual approach that leverages both national and EU funding could create a more resilient and strategically aligned research ecosystem in Malta. The government's recent initiatives to increase research and development spending are a step in the right direction, but these efforts need to be bolstered with clear policies and frameworks that prioritise national interests (Zammit, 2024). A potential solution could be the establishment of a national research fund, which would serve as a catalyst for local innovation and capacity building.

Centralising research funding in Malta through such a dedicated fund could bring several advantages. For instance, it might streamline the allocation of resources, reducing fragmentation and allowing for a more focused and coherent research agenda aligned with national priorities. By centralising oversight, the fund could also ensure greater consistency in funding decisions, minimising duplication of efforts and enabling a strategic allocation of resources to high-impact areas. This approach could simplify access to funding for researchers, particularly for smaller institutions and early-career academics who may currently struggle with the complexities of securing EU grants. Additionally, the previously mentioned centralised national fund could facilitate more targeted support for projects that address Malta's unique socio-economic challenges, thereby fostering research that directly benefits local communities.

While these potential benefits align with sentiments shared in the interviews, it is crucial to carefully consider how such a system could be implemented effectively to complement existing EU funding opportunities, rather than replace them. By striking this balance, Malta could develop a more robust, adaptive research landscape that drives sustainable growth and innovation.

Theme 2 - Administrative and Bureaucratic Barriers

The research revealed that administrative and bureaucratic obstacles are a major hindrance to the research funding landscape in Malta. Across the interviews, stakeholders consistently highlighted the overwhelming administrative burdens tied to both national and EU funding processes. The layers of bureaucracy involved in the application, management, and reporting stages of research projects significantly slow down the progress of research and discourage researchers, particularly those with limited administrative support. This issue is especially prevalent among smaller institutions and independent researchers who lack the resources to navigate these complex procedures efficiently. This observation aligns with the

literature's emphasis on the disproportionate challenges faced by smaller institutions and early-career researchers in navigating complex funding processes (Malta Council for Science and Technology, 2024b).

Administrative hurdles manifest in several ways, starting with the application process. Preparing funding proposals, especially for EU projects, requires a detailed understanding of procurement rules, eligibility criteria, and extensive documentation. For Maltese researchers, who often operate in smaller research offices with limited administrative staff, this becomes a daunting task. Many stakeholders emphasised that the time and effort required to prepare a single funding application could take several months, during which researchers must divert their attention away from actual research activities. To alleviate some of these challenges, it is worth noting that a two-stage submission process has already been implemented for many grants, which allows researchers to submit a simplified initial proposal before committing to the more complex and time-consuming full application.

Moreover, once funding is secured, the bureaucratic challenges do not end. Project management, financial reporting, and compliance with procurement regulations are often cited as ongoing headaches for researchers. The rigid nature of these requirements means that even minor discrepancies in reporting can lead to delays in funding disbursements or, in worst-case scenarios, the withdrawal of funds. While it would be ideal to introduce some flexibility in the procurement process to better accommodate the needs of research projects, it is also important to acknowledge that procurement rules are in place to ensure proper use of public funds. Researchers must adhere to these rules, even if they can be cumbersome, to maintain the integrity of the funding process. For SMEs involved in research projects, this can be particularly detrimental as they lack the internal capacity to handle such administrative burdens effectively. Stakeholders reported that these barriers are a significant factor in

discouraging SMEs from participating in research initiatives, despite their potential to contribute valuable industry insights and innovation.

Another area where administrative hurdles are evident is in the procurement process within the public sector. Rigid procurement rules, designed to ensure transparency and accountability, are often not well-suited to the dynamic and iterative nature of research projects. Researchers need flexibility to adapt their methods and resources as new insights emerge, but current procurement processes are slow to accommodate such changes. For instance, obtaining approvals for equipment purchases or subcontracting services can take weeks or even months, causing delays that could jeopardise project timelines and outcomes. This lack of flexibility is a major source of frustration for project coordinators who need to ensure the timely execution of research activities.

To mitigate these issues, stakeholders suggested the need for streamlined administrative processes that are more aligned with the practical realities of conducting research. Simplifying application forms, reducing redundant documentation, and introducing digital platforms for submissions and reporting were among the most frequently mentioned recommendations. These changes would not only enhance the efficiency of the funding process but also free up researchers' time, allowing them to focus more on their scientific work. In line with Smits & Denis (2014), stakeholders also advocated for the establishment of dedicated support units within research institutions to assist with grant applications and project management. These units could provide specialised expertise in navigating both national and EU funding requirements, thereby reducing the administrative burden on individual researchers.

While simplifying processes is crucial for fostering a more efficient research environment, it is equally important to recognise that, in the private sector, certain

regulations, such as State Aid rules, play a vital role in ensuring accountability for public funds allocated to private entities. Although these regulations may increase the complexity and administrative workload, they are necessary for maintaining transparency. The checks and documentation required help verify that funds are used appropriately, ensuring that public investments are responsibly managed. Thus, any effort to streamline administrative processes must also balance the need for robust oversight to protect the integrity of public funding.

Another one of the most commonly discussed challenges was the excessive reporting requirements imposed on funded projects. While accountability and transparency are important, the current level of detail required is seen as excessive and time-consuming. Researchers expressed concerns that these reporting demands are not proportionate to the size of the grants, with smaller projects often facing the same level of scrutiny as larger, multi-million-euro projects. This one-size-fits-all approach disproportionately impacts smaller research teams and early-career researchers who are less experienced with these processes. Stakeholders also suggested adopting such a system whereby projects are assessed based on their scale and impact. Similarly, the literature critiques reporting requirements that strain research teams administratively (National Science Board, 2014). Stakeholders advocated for a tiered system to balance accountability with administrative efficiency. It may be worthwhile for both national authorities and EU funding bodies to consider evaluating the complexity of these reporting obligations. Streamlining these processes could reduce the administrative burden on researchers without compromising oversight and accountability.

A related issue is the lack of feedback provided to unsuccessful funding applicants. Many researchers reported that they invest substantial time and resources into preparing proposals, only to receive a generic rejection notice with little to no explanation. This lack of constructive feedback prevents researchers from improving their proposals for future submissions, leading to repeated failures and wasted effort. Providing detailed feedback

could significantly enhance the quality of subsequent applications, ultimately benefiting the research community as a whole.

In addition to simplifying administrative processes, stakeholders also called for better training and capacity-building initiatives to help researchers navigate the complexities of funding applications and project management. This could include workshops, webinars, or even one-on-one mentoring sessions focused on grant writing, financial management, and compliance with procurement rules. By equipping researchers with the necessary skills, Malta could improve its success rate in securing both national and EU research grants.

The administrative burden is not only a practical challenge but also a significant demotivating factor for researchers. The interviews revealed that the stress and frustration associated with managing bureaucratic hurdles often lead to burnout, particularly among early-career researchers who are already dealing with job insecurity and the pressure to publish. This, in turn, affects the overall research output and innovation potential of the country. Therefore, addressing administrative inefficiencies is not just about improving project management but also about enhancing researcher well-being and retaining talent within Malta's research ecosystem.

Theme 3 - Short-Term Funding and Project Continuity

The issue of short-term funding emerged as a significant barrier to the continuity and long-term success of research projects in Malta. Stakeholders consistently highlighted that the prevalent model of short-term, project-specific grants leads to fragmented research efforts, disrupts team stability, and ultimately hampers the development of sustained research programs. This challenge is particularly acute in Malta, where national funding sources are limited, and researchers often depend heavily on short-term EU funding schemes that prioritise immediate outputs over sustained scientific exploration.

One of the core problems associated with short-term funding is its impact on the continuity of research projects. Many research areas, especially those tackling complex societal challenges like climate change, public health, or sustainable development, require sustained, multi-year efforts to achieve meaningful results. For example, studying subjects such as the preservation of cultural heritage requires long-term funding, as these projects demand extended timelines for comprehensive analysis and impactful outcomes. However, the current funding landscape in Malta, which is dominated by grants with short lifespans (typically one to three years), often forces researchers to cut projects short before they reach their full potential. Stakeholders emphasised that such a fragmented approach leads to a cycle of unfinished projects and lost knowledge, as research teams are frequently disbanded once funding ends.

The reliance on short-term grants also creates instability in research teams. Since most funding is tied to specific projects with defined durations, researchers are often employed on fixed-term contracts. This leads to high turnover rates, with experienced researchers leaving projects prematurely due to job insecurity. The loss of skilled personnel disrupts the flow of research activities, as new team members need time to get up to speed, resulting in delays and a loss of institutional knowledge. This issue is particularly challenging for early-career researchers, who face difficulties securing stable, long-term positions in academia. The lack of job security discourages talented individuals from committing to research careers in Malta, exacerbating the brain drain as they seek more stable opportunities abroad.

In addition to impacting human resources, the short-term nature of grants also limits the ability to plan and execute comprehensive research strategies. Researchers reported that they are often forced to focus on “low-hanging fruit”, projects that promise quick results and publications rather than those that are more impactful in the long term. The pressure to demonstrate immediate results for funding bodies leads to a focus on short-term metrics like

the number of publications or patents, rather than meaningful contributions to scientific knowledge or societal impact. This focus on quick wins stifles innovation, as researchers are less likely to take on ambitious projects that may take years to yield results.

Stakeholders suggested that one way to mitigate these issues is to introduce more flexible, long-term funding mechanisms that allow research teams to pursue ambitious projects without the constant pressure of short funding cycles. For example, establishing funding schemes with durations of five to ten years would provide researchers with the stability needed to develop and refine their research agendas. This could be particularly beneficial for research areas that align with Malta's national priorities, such as environmental sustainability, digital innovation, and public health. Additionally, a shift towards outcome-based funding, where projects are evaluated based on their societal impact rather than just immediate outputs, could encourage researchers to take on more challenging projects with the potential for high impact.

Another recurring theme from the interviews was the negative impact of short-term funding on collaborative research efforts. Long-term collaborations, particularly with international partners, require stable funding commitments to build trust and ensure continuity. However, the current funding environment makes it difficult to maintain such partnerships. Stakeholders noted that while initial funding might be secured to start a collaborative project, it is often challenging to secure follow-up funding to continue the partnership. This lack of continuity not only disrupts collaborative research but also damages Malta's reputation as a reliable partner in international research consortia.

The problem is compounded by the lack of bridging funds or transitional grants to support researchers between projects. Stakeholders highlighted that there are currently no mechanisms in place to provide interim funding for projects that are awaiting the results of

new grant applications. As a result, research teams often face gaps in funding that force them to halt their work, even when they are on the cusp of significant breakthroughs. These funding gaps are particularly detrimental for projects involving experimental work or field studies, where disruptions can lead to the loss of valuable data or samples. Establishing a system of bridging grants could help alleviate this issue by providing temporary support to maintain project momentum.

The short-term funding model also affects the ability of researchers to invest in infrastructure and resources. Long-term projects often require significant upfront investments in equipment, technology, and training. However, short-term grants do not typically cover these capital expenses, forcing researchers to make do with limited resources. This creates a cycle where researchers are unable to build the capacity needed to compete for larger, more prestigious grants, further limiting their ability to conduct impactful research. Stakeholders suggested that introducing more flexible funding categories, which include provisions for infrastructure and capacity building, could help researchers better plan for long-term projects.

Furthermore, the current focus on short-term funding has implications for the retention of expertise and institutional knowledge. When research teams are disbanded due to the end of funding, the knowledge and skills accumulated over the project's lifespan are often lost. This results in a significant loss of intellectual capital, which could have been leveraged for future projects. Stakeholders advocated for the creation of dedicated funding streams aimed at building and sustaining research capacity, which would enable institutions to retain key personnel and build on existing research rather than starting from scratch with each new grant cycle. Another potential improvement would be to create a case-by-case assessment at the end of the project duration to determine if additional funding or support might be warranted to further develop upon the project results. This tailored approach, rather than

relying solely on ranking lists, could provide more flexibility and help promising projects to achieve their full potential.

Theme 4 - Industry Collaboration and Commercialisation

One of the critical themes that emerged from the interviews was the misalignment between academic research goals and industry needs in Malta. This disconnect, coupled with insufficient incentives for commercialisation, poses significant challenges to fostering collaboration between academia and the private sector. Stakeholders highlighted that while there is growing recognition of the importance of industry-academia collaboration, the existing funding mechanisms and policy frameworks are not adequately designed to facilitate these partnerships. As a result, Malta's research ecosystem struggles to translate scientific discoveries into market-ready products and services. This aligns with the literature, which underscores the structural challenges in Malta's research ecosystem, including the need for stronger industry-academia linkages and support systems to drive innovation (Malta Council for Science and Technology, 2024b).

The lack of structured incentives for commercialisation is one of the main barriers to effective collaboration. Researchers often face limited motivation to engage with industry partners due to the lack of recognition for commercialisation activities within the academic evaluation systems. The emphasis on academic publications as the primary measure of research success means that researchers prioritise publishing in high-impact journals over exploring commercialisation opportunities. This misalignment of incentives discourages researchers from pursuing industry partnerships, as such collaborations may not yield immediate publications or fit within the traditional metrics of academic performance. The literature review conducted also highlighted the importance of recognising commercialisation activities within academic evaluation systems, as seen in successful examples from countries like Germany, where performance-based incentives are used to align research outcomes with

market needs (Hicks, 2012). The findings complement this by illustrating the lack of similar mechanisms in Malta and how this reinforces the prioritisation of academic publications over industry collaboration.

Moreover, stakeholders noted that while some funding schemes encourage collaboration between academia and industry, they often lack the flexibility needed to adapt to the dynamic nature of research commercialisation. For instance, existing funding programs may impose rigid criteria that do not align with the timelines and development cycles of commercial projects. This rigidity can be particularly challenging for startups and SMEs that require agile funding models to bring innovative solutions to market quickly. This observation is consistent with the literature, which discusses the need for flexible funding mechanisms to accommodate the dynamic nature of research commercialisation (Tenhunen-Lunkka & Honkanen, 2024). The findings provide a localised perspective, highlighting how many industry players are reluctant to engage in collaborative research projects that are bound by inflexible funding terms.

Another issue is the limited availability of industry-led funding initiatives in Malta. Unlike in larger economies where industry players actively fund research projects to gain competitive advantages, Maltese companies, especially SMEs, often lack the resources to invest in research and development. This creates a dependency on public funding sources, which are frequently skewed towards academic institutions. Stakeholders suggested that introducing targeted incentives, such as tax credits for companies that invest in collaborative research, could stimulate private sector involvement. Additionally, establishing industry-specific funding streams could help bridge the gap between research outputs and market needs, fostering a more innovation-driven economy.

The interviews highlighted a critical gap in Malta's research ecosystem: the absence of well-established research centres like those in countries such as Cyprus (The Cyprus Institute, 2015). In other regions, these centres play a vital role in transferring knowledge from universities to industry, helping researchers secure patents, licenses, and venture capital (Frederick University, 2020). Without such infrastructure, Maltese researchers face significant hurdles in navigating the commercialisation process, limiting the potential impact of their research. This finding resonates with the literature's emphasis on the role of well-established research hubs in fostering innovation and commercialisation, as evidenced by the success of Horizon Europe-funded projects in larger EU states (European Parliament, 2017). To address this shortcoming, stakeholders frequently emphasised the need for collaborative research centres tailored to Malta's strengths in areas like pharmaceuticals, maritime technology, and information technology. These specialised centres could serve as dynamic platforms for joint projects, where academic expertise and industry insights converge to drive innovation. By facilitating partnerships and pooling resources, they would not only accelerate technology development but also enhance Malta's competitive position in niche markets. Furthermore, these centres could provide hands-on industry experience for students and early-career researchers, enhancing their skills and employability. In turn, this would foster a more robust, industry-ready workforce, creating a cycle where research outputs are more effectively translated into tangible economic benefits for Malta.

Furthermore, stakeholders highlighted the need for better alignment between national research priorities and industry needs. Currently, research projects are often designed based on academic interests or to align with EU funding calls, rather than being driven by industry demand or local market needs. This disconnect limits the relevance of research outputs for Maltese businesses, reducing the likelihood of successful commercialisation. To address this, stakeholders recommended establishing regular dialogues between academia, industry, and

government to ensure that research projects are aligned with the country's economic priorities and areas of competitive advantage.

The need for mentorship and training in commercialisation was another aspect that emerged from the discussions. Many researchers, especially those early in their careers, lack the experience and business competence necessary to translate their research into viable business ventures unaided. Stakeholders recommended the introduction of training programs focused on business development, market analysis, and product commercialisation. These programs could be offered through partnerships with business incubators or the national chamber of commerce, providing researchers with the skills and networks necessary to bring their innovations to market.

Theme 5 - Researcher Motivation and Disincentives

The theme of researcher motivation emerged as a significant concern in Malta's research funding landscape. Stakeholders repeatedly highlighted that various systemic disincentives are undermining the motivation of researchers, particularly early-career academics and those considering a long-term research career. These challenges are compounded by issues such as job insecurity, limited career progression, and the overwhelming administrative burdens associated with funding applications and project management. Addressing these disincentives is crucial for fostering a vibrant research ecosystem in Malta that can attract and retain talent.

A primary factor affecting researcher motivation is the pervasive sense of job insecurity. Most research positions in Malta are tied to short-term, project-based contracts due to the prevalent funding model that favours short-term grants. As a result, researchers often face uncertainty regarding their future employment, which deters many talented individuals from committing to a career in academia or research. This situation is particularly challenging

for early-career researchers, who are often unable to secure permanent positions despite having the necessary qualifications and experience. Stakeholders emphasised that this lack of stability not only affects the morale of researchers but also contributes to the ongoing brain drain, with Maltese researchers opting to work for local industry or electing for more secure opportunities abroad.

Another significant issue is the limited opportunities for career progression within the research sector. Unlike larger research ecosystems in countries like the UK or Germany, where researchers can advance through well-defined career tracks and find their professional niche, the Maltese research landscape offers limited avenues for promotion and professional growth (Reichert, 2019). Stakeholders reported that the lack of a structured career pathway discourages researchers from pursuing long-term projects or investing in their skills development. The current focus on short-term project deliverables rather than the long-term development of research talent contributes to this issue, as researchers are often evaluated based on immediate outputs rather than their potential for future contributions.

The administrative burden associated with securing research funding is another demotivating factor. Researchers in Malta frequently expressed frustration with the time-consuming and complex application processes required for both national and EU funding. The bureaucratic demands do not end once funding is secured; they extend into project management, financial reporting, and compliance with procurement regulations. This administrative workload takes away valuable time that could otherwise be dedicated to actual productive research activities. Stakeholders suggested that streamlining these processes and providing administrative support through dedicated research offices could alleviate some of these pressures, thereby enhancing researcher motivation.

In addition to job insecurity and administrative burdens, the emphasis on individual achievements, particularly the requirement to publish as first author, creates a competitive rather than collaborative research environment. The current evaluation metrics used to assess researcher performance prioritise first-author publications, which are often seen as the primary indicator of academic success. This focus on individual output discourages researchers from engaging in collaborative projects, which may take longer to yield results but have the potential for greater impact. The stakeholders argued that this emphasis on first-author publications creates a disincentive for early-career researchers to participate in interdisciplinary or multi-institutional collaborations, which are essential for tackling complex societal challenges.

Moreover, the pressure to publish frequently in high-impact journals can lead to burnout among researchers, especially those early in their careers who are striving to build their academic credentials. The “publish or perish” culture forces researchers to prioritise quantity over quality, often at the expense of more meaningful, long-term research projects that could have a significant impact on Malta’s socio-economic landscape (Nemec et al., 2020). Stakeholders recommended that funding bodies and academic institutions should adopt a more holistic approach to evaluating research performance, one that takes into account collaborative work, societal impact, and knowledge transfer, rather than just publication metrics.

Furthermore, stakeholders noted that researchers in Malta often lack access to adequate resources, infrastructure, and training opportunities. Limited funding for research infrastructure means that researchers must often work with outdated equipment or inadequate facilities, which can be a significant barrier to conducting high-quality research. Additionally, there is a lack of professional development programs focused on building the skills needed to navigate the evolving research landscape, such as grant writing, project management, and

commercialisation. Providing more opportunities for skills development and ensuring access to modern research facilities could enhance both motivation and the quality of research outputs.

Academic researchers can be further incentivised to focus more on applied, market-driven research rather than purely fundamental research. Offering targeted incentives to encourage collaboration with industry partners could transform this landscape by bridging the gap between academia and industry. Such incentives would help align their goals, optimising resource use and accelerating the translation of research into commercially viable products, ultimately driving innovation and economic growth.

The lack of mentorship and support networks also contributes to the disincentives faced by researchers in Malta. Early-career researchers, in particular, noted that they often struggle to find mentors who can guide them through the complexities of the research process and career development. Establishing structured mentorship programs, where senior researchers provide guidance to younger colleagues, could foster a more supportive research environment. This, in turn, would help to retain talent and build a more resilient research community in Malta.

Conclusion

The findings from this study highlight critical gaps and challenges within Malta's research funding landscape, as revealed through in-depth interviews with key stakeholders. The discussion highlights that while Malta's research funding landscape shows potential, significant barriers, such as limited national funding, heavy reliance on EU grants, and administrative complexities, remain. Addressing these challenges requires a dual strategy of enhancing national funding mechanisms and streamlining administrative processes to better support researchers. Strengthening industry collaboration, fostering long-term funding

stability, and building dedicated support structures can help align research efforts with national priorities. Only by prioritising sustainable investments and reducing bureaucratic hurdles, can Malta create a more resilient and impactful research ecosystem that drives innovation, economic growth, and societal progress.

Conclusion and Opportunities for Future Research

This study has explored the complexities and challenges of Malta's research funding landscape, focusing on optimizing systems to foster a more robust and sustainable research ecosystem. By leveraging in-depth qualitative interviews with key stakeholders, the research identified significant barriers and opportunities within the current funding structures. These findings provide a critical understanding of how Malta can enhance its research capabilities, drive innovation, and ultimately contribute to socio-economic growth.

The research revealed that Maltese researchers face several significant obstacles when attempting to secure research funding (RQ1). Key challenges include the heavy administrative burdens associated with EU grant applications, which are often complex and time-consuming, especially for early-career researchers and smaller institutions with limited administrative support. Malta's reliance on EU grants due to limited national funding forces researchers to align their projects with EU priorities, which may not always address Malta's specific needs. This dependence restricts strategic autonomy, making it difficult for researchers to focus on issues critical to the nation, such as public health, environmental sustainability, and economic diversification. However, despite these hurdles, Malta benefits from access to substantial EU funding opportunities, which support large-scale collaborations and enhance the country's research profile.

To address these barriers and optimize the research process (RQ2), the study suggests implementing targeted strategies that can streamline funding access and enhance project outcomes. Simplifying administrative processes and introducing tiered reporting systems could reduce the bureaucratic workload on researchers, enabling them to focus more on impactful research. Additionally, establishing a centralised national research fund with more

stable and long-term funding mechanisms could provide much-needed financial security, empowering researchers to engage in projects aligned with national priorities.

Enhancing industry collaboration emerged as a vital area for improving Malta's research ecosystem. By fostering partnerships between academia and the private sector, Malta can better translate research into commercially viable products, driving both innovation and economic growth. Introducing incentives, such as tax credits and dedicated funding streams, could encourage industry engagement in research and development activities. Strengthening collaboration can also optimise resource use and accelerate the commercialisation of research outputs, further contributing to national economic goals.

The study also highlights the need for capacity-building initiatives and better support structures for researchers. Many early-career researchers in Malta struggle with limited access to resources, training, and mentorship, which hinders their ability to secure competitive funding. Establishing dedicated support units within research institutions to assist with grant applications, project management, and commercialisation would help alleviate these challenges.

Furthermore, the research underscores that Malta's funding landscape is overly reliant on short-term grants, which disrupt project continuity and discourage researchers from pursuing long-term, high-impact projects. Investing in more flexible and sustainable funding models could support research addressing long-term socio-economic and environmental challenges. Prioritising interdisciplinary projects that tackle issues such as water management, energy efficiency, and climate resilience could further enhance Malta's research output.

Future research should delve deeper into the political and systemic factors shaping the research ecosystem in Malta. Potential themes for exploration could be segregation and

fragmentation within the research sphere. Such themes are hypothesised to significantly influence collaboration and effectiveness. Exploring these areas could uncover additional opportunities for systemic improvements. Additionally, building on this, an implementation study could be conducted to examine the systematic uptake of research findings and evidence into policy and practice. Such research would provide a framework for understanding when, how, and why strategies designed to translate evidence from research into practice can be effectively integrated (Binagwaho et al., 2019). By highlighting practical approaches, this work could inform strategies that improve funding accessibility and enhance the overall research ecosystem. Investing in national projects and celebrating local research achievements could inspire wider participation and strengthen Malta's position in global collaborations. Initiatives such as recognition programs and additional support for collaborative leadership could foster a culture of innovation and ambition.

In conclusion, optimizing Malta's research funding system requires a multi-faceted, evidence-based approach that addresses administrative inefficiencies, enhances industry collaboration, and strengthens national funding mechanisms. By implementing the recommendations outlined in this study, Malta can build a more resilient and innovative research landscape. These efforts will not only drive scientific discovery but also contribute to the nation's socio-economic development. By addressing gaps, such as those highlighted in future research opportunities, Malta can better position itself as a leader in R&I within the EU and beyond.

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Annexes

Annex 1: Template for Concealed Identity Information and Recruitment Letter

Dear Participant,

My name is Christy Baldacchino. I am currently reading for a Master's Degree in Evidence-Based Management and Effective Decision Making under the academic supervision of Dr David Baldacchino, at the Faculty of Economics, Management and Accountancy (FEMA) of the University of Malta. Our research study involves optimizing local research funding processes through evidence-based decision-making.

Your insights and experiences are invaluable to our understanding, and we would greatly appreciate your participation in this study. We are therefore writing to invite you to participate in an interview as part of our research. The interview will be conducted by myself, Christy Baldacchino, as the researcher and will last approximately 1 hour. Please note that your identity will be kept strictly confidential throughout the study. Any information you provide will be anonymised, and your responses will be coded to ensure your privacy. Additionally, please be advised that the interview will be recorded for clarity and ease of reporting.

Your participation in this interview is entirely voluntary, and you may choose to withdraw at any time without penalty. Additionally, your decision to participate or decline participation will not affect any current or future relationship with our organization.

If you are willing to participate, we could schedule a convenient time for a conversation. Thank you for considering this invitation. We look forward to the opportunity to learn from your perspectives and experiences.

Sincerely,

_____	_____
Christy Baldacchino	Dr David Baldacchino
Researcher	Supervisor

Annex 2: Template for Revealed Identity Information and Recruitment Letter

Dear Participant,

My name is Christy Baldacchino. I am currently reading for a Master's Degree in Evidence-Based Management and Effective Decision Making under the academic supervision of Dr David Baldacchino, at the Faculty of Economics, Management and Accountancy (FEMA) of the University of Malta. Our research study involves optimizing local research funding processes through evidence-based decision-making.

Your insights and experiences are invaluable to our understanding, and we would greatly appreciate your participation in this study. We are therefore writing to invite you to participate in an interview as part of our research. The interview will be conducted by myself, Christy Baldacchino – as the researcher and will last approximately 1 hour. Your name may be used in any reports or publications resulting from this research, but your responses will be handled with the utmost confidentiality and respect for your privacy. Additionally, please be advised that the interview will be recorded for clarity and ease of reporting.

Your participation in this interview is entirely voluntary, and you may choose to withdraw at any time without penalty.

If you are willing to participate, we could schedule a convenient time for a conversation. Thank you for considering this invitation. We look forward to the opportunity to learn from your perspectives and experiences.

Thank you for considering this invitation.

Sincerely,

_____	_____
Christy Baldacchino	Dr David Baldacchino
Researcher	Supervisor

Annex 3: Template for Identity Concealed Consent Form

Principal Investigator: Christy Baldacchino

Introduction
I, *[Participant's Name]*, have been invited to participate in a research study titled *"An evidence-based approach to optimising Malta's research funding systems"*. Before agreeing to participate, I have been provided with information about the study's purpose, procedures, risks, benefits, confidentiality measures, and my rights as a participant. I have had the opportunity to ask questions, and any concerns I raised have been addressed to my satisfaction.

- Purpose and Procedures; The purpose of this study is to learn from past research efforts in improving how research funding is allocated. It seeks to identify both the strengths and barriers encountered by researchers as they pursue funding opportunities. By uncovering these obstacles, the study aims to propose effective strategies to mitigate them, ultimately fostering an environment that encourages greater research productivity and enhances the success rates of securing research funding. Participation will involve engaging in a semi-structured interview. The estimated duration of my participation is approximately one hour.
- Voluntary Participation; I understand that my participation in this study is entirely voluntary. I am under no obligation to participate, and I am free to withdraw from the study at any time without penalty or consequence. In case I withdraw, I understand that all records and information collected will be destroyed.
- Confidentiality and Use of Data; I understand that all information collected during this study will be kept strictly confidential. Any identifying information will be removed or anonymized to protect my privacy. Only authorized members of the research team will have access to the data, and they are bound by confidentiality agreements. I acknowledge that the interview will be recorded to ensure clarity and facilitate accurate reporting, with the recorded material being kept confidential. Additionally, I understand that the data collected during this study may be used for research purposes, including analysis, publication, or presentation. However, my identity will be kept confidential, and my name will not be associated with any published or presented findings without my explicit consent. I also understand that the recording will be destroyed 3 years after the interview takes place
- Benefits and Risks; I understand that there may be no direct benefits to me for participating in this study. However, my participation may contribute to advancing knowledge in the field.
- Contact Information; If I have any questions or concerns about the study, I can contact Christy Baldacchino at christy.baldacchino.17@um.edu.mt.

By signing below, I confirm that:

- I have read and understood the information provided in this consent form.
- I have had the opportunity to ask questions and have received satisfactory answers.
- I voluntarily agree to participate in this research study.

Participant's Signature: _____

Date: _____

Researcher's Signature: _____

Supervisor's Signature: _____

Date: _____

Annex 4: Template for Identity Revealed Consent Form

Principal Investigator: Christy Baldacchino

Introduction
I, *[Participant's Name]*, have been invited to participate in a research study titled *"An evidence-based approach to optimising Malta's research funding systems"*. Before agreeing to participate, I have been provided with information about the study's purpose, procedures, benefits, confidentiality measures, and my rights as a participant. I have had the opportunity to ask questions, and any concerns I raised have been addressed to my satisfaction.

- Purpose and Procedures; The purpose of this study is to learn from past research efforts in improving how research funding is allocated. It seeks to identify both the strengths and barriers encountered by researchers as they pursue funding opportunities. By uncovering these obstacles, the study aims to propose effective strategies to mitigate them, ultimately fostering an environment that encourages greater research productivity and enhances the success rates of securing research funding. Participation will involve engaging in a semi-structured interview. The estimated duration of my participation is approximately one hour.
- Voluntary Participation; I understand that my participation in this study is entirely voluntary. I am under no obligation to participate, and I am free to withdraw from the study at any time without penalty or consequence. In case I withdraw, I understand that all records and information collected will be destroyed.
- Confidentiality and Use of Data; I understand that my identity will be revealed during the study. My name may be used in any reports or publications resulting from this research, but responses will be handled with the utmost confidentiality and respect for your privacy. Furthermore, I acknowledge that the interview will be recorded to ensure clarity and facilitate accurate reporting, with the recorded material being kept confidential. I understand that the data collected during this study may be used for research purposes, including analysis, publication, or presentation. My name may be associated with any published or presented findings unless I request otherwise. However, my personal information will be handled confidentially, and steps will be taken to protect my privacy. I also understand that the recording will be destroyed 3 years after the interview takes place.
- Benefits and Risks; I understand that there may be no direct benefits to me for participating in this study. However, my participation may contribute to advancing knowledge in the field.
- Contact Information; If I have any questions or concerns about the study, I can contact Christy Baldacchino at christy.baldacchino.17@um.edu.mt.

By signing below, I confirm that:

- I have read and understood the information provided in this consent form.
- I have had the opportunity to ask questions and have received satisfactory answers.
- I voluntarily agree to participate in this research study.

Participant's Signature: _____

Date: _____

Researcher's Signature: _____

Supervisor's Signature: _____

Date: _____