National Productivity Board

The National Productivity Board

Annual Report

2023

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INTRODUCTION TO THE NATIONAL PRODUCTIVITY BOARD

The National Productivity Board was established in line with L.N. 275 of 2019 under the Malta Council for Economic and Social Development Act (CAP. 431). The Malta Council for Economic and Social Development (MCESD) is an advisory council that issues opinions and recommendations to the Maltese government on matters of economic and social relevance. Under the remit of the MCESD is the National Productivity Board, which assesses and analyses productivity and competitiveness in Malta.

The National Productivity Board was set up in 2019. The Board is composed of 11 members, comprising of the chairperson and 10 other members. The Chairperson of the MCESD is ex officio and acts as the Chairperson of the Board. The other 10 members comprise of a senior official nominated by the Minister for Finance, a member nominated by the Governor of the Central Bank of Malta, four members nominated by the workers' organisations constituted bodies sitting in the Council, and four members nominated by constituted bodies representing national employers' organisations forming part of the Council. The National Productivity Board is also tasked with the preparation of the annual report.

The Board fulfilled the objectives of the EU Council recommendation in relation to the National Productivity Boards, as well as the diagnosis and analysis of productivity and competitiveness-related developments in Malta and Gozo.

The Authors: Contributing Economists to the National Productivity Board 2023 Annual Report

Silvan Mifsud is a Director at EMCS Advisory Limited. He holds a degree in Banking & Finance from the University of Malta and an MBA from the University of Reading. Silvan specialises in Corporate Finance and Business Leadership. Silvan has been involved in various sectors of the economy from telecommunications, financial services and also manufacturing, holding various managerial and directorship roles. Silvan has also authored various economic analysis articles.

Kurt Muscat is an Assistant Manager at EMCS Advisory Limited. He holds a Master of Science in Economics from the University of Malta and an ACCA qualification. He specialises in economic analysis, financial analysis, modelling & forecasting and company valuations. Kurt has also authored several economic analysis reports and economic analysis articles.

Diane Cilia, an economist by profession. She holds an Honours degree in Economics and a Master of Science in Economics from the University of Malta. She specialises in economic and financial analysis. As an Associate at EMCS Advisory Limited, she has contributed her expertise to numerous studies conducted for both the private and public sectors, applying economics in the advisory field.

Prof Philip von Brockdorff is an applied economist. He holds a Master of Science in Economics (University of Wales) and a DPhil in Economics (University of York). He served as Deputy Dean at the Faculty of Economics, Management and Accountancy at the University of Malta and is currently Rector's Delegate for the Gozo Campus. His areas of specialisation include Public Sector Economics, Cost Benefit Analysis, Transport Economics and Economics of Ageing Populations. He has authored several academic papers and reports including three on behalf of the National Productivity Board at the Malta Council for Economic and Social Development. He is vice-President of the Workers' Group at the European Economic and Social Committee based in Brussels for which he has authored several Opinions mostly related to economic

matters. He is also a Governor at the Malta Financial Services Authority, Government's representative on the Low Wages Commission, and is currently Chairman of Air Malta.

Dr Jonathan Spiteri is a Senior Lecturer within the Faculty of Economics, Management and Accountancy at the University of Malta. A PhD graduate in Economics from the University of Edinburgh, Jonathan's research interests include environmental economics, public health, macroeconomics and behavioural science, and his academic work has been published in several leading international peer-reviewed journals and books. He also has significant consultancy experience across various private and public sector projects, both in Malta and in London, particularly within the fields of environmental valuation, cost-benefit analysis, macroeconomic policy and ESG. Dr Spiteri has also served as an expert on several opinions drafted by the European Economic and Social Committee and is a co-opted member of the European Chemicals Agency's Committee for Socio-Economic Analysis (SEAC).

About EMCS Advisory Limited

EMCS is one of the leading boutique advisory and tax firms in Malta serving both local and international clients for the past 40 years. EMCS (Economic Management Consultancy Services) was born primarily at being the first economic advisory firm in Malta. We are proud to have maintained economic advisory as a central part of our offering for the past 40 years. Specifically, EMCS Advisory Limited provides a range of services including business advisory, EU Advisory and Market Research & Evaluation.

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EXECUTIVE SUMMARY

The legal notice setting up the National Productivity Board stipulates that the National Productivity Board shall be tasked with 'preparing an annual report outlining the main competitiveness and productivity challenges facing Malta, and the policy responses required to meet them and any recommendations thereto.' In this regard, this report shall focus on assessing the relationship between wages and productivity.

Chapter 1 to 3 highlights the economic situation of Malta as compared to its European counterparts. As discussed in detail within this report, the Maltese economy has, on average, consistently lagged behind its European counterparts when it comes to labour productivity. Labour productivity for the purpose of this report was defined as the nominal gross value added as a proportion of the total workforce in each economic sector. Given the consensus regarding the importance of wages for productivity, the focus of this report will be centred around assessing the changes in wages and salaries and productivity, understanding the specific challenges and opportunities that have emerged from the assessed relationship between wages and productivity and subsequently provide policymakers with several recommendations intended to mitigate or overcome such challenges.

The recommendations put forward in this report must be assessed in light of the current economic scenario faced by the Maltese economy, and indeed the rest of the world. It should be noted that several positive economic developments were recorded over 2022, especially in terms of GDP growth and labour market developments. In 2022, the Maltese economy recorded one of the lowest unemployment rates (2.9%) in the EU and the real GDP growth exceeded the EU-27 average, as the real GDP growth for Malta stood at 7.08% compared to the EU average of 3.41%. Notwithstanding these developments, there are still numerous economic challenges that the Maltese economy faces and that are leading to a high degree of uncertainty namely due to the geopolitical conflict between Russia and Ukraine, the ongoing military and political conflict in the Levant, the inflationary pressures and supply-chain-disruptions. Even though these disruptions are spread worldwide, some factors may

still hinge on the relative competitiveness of Malta. Indeed, in October 2023, Malta's headline inflation rate stood above the Euro Area, with an inflation rate of 4.3% in Malta and 2.9% in the Euro Area. However, looking at the core inflation, we see that the EA inflation for October 2023 when excluding energy stood at 4.9% and when excluding energy and food stood at 4.2%, whilst in Malta these stood at 4.6% and 3.8% respectively. This indicates that when looking at elements of the core inflation, especially when comparing the HICP based inflation after excluding energy, Malta has been having an inflation rate just below the Euro area average in 2023.

Given the underlying economic conditions, for this year's report, the National Productivity Board decided to focus on specific economic sectors in order to delve deeper into understanding the relationship between wages and productivity in Malta. The first step was to understand the wage dynamics and trends overtime in Malta. The next step was to synthesis the academic literature with a focus on highlighting several aspects of the wage-productivity relationship that can be particularly relevant to the Maltese economy. This provided the background to develop an appropriate understanding of what influences the relationship between wages and productivity. The insights gathered from the literature review served as a crucial step to formulate the econometric model, which was estimated on an annual basis, over the period 2012 to 2022. The following seven economic sectors were chosen based primarily on their relevance for productivity in the Maltese economy, these are the Manufacturing, Construction, Financial and Insurance Activities, Gaming, Information and Communication Technology, Professional, Scientific and Technical Activities, Accommodation and Food Service and Wholesale and Retail. The results attained from the econometric model enabled us to develop sector-specific insights that allowed for the identification of a set of ten recommendations aimed to spur on and facilitate the wages and productivity nexus.

The data presented in this report is derived from information collected during the period between 1st August and 31st October. Hence, this report had a data cut-off date 31st October 2023. It is important to note that any analyses, findings, or conclusions based on this data are reflective of the conditions and dynamics within that specific timeframe. Changes or developments occurring after this period may not be accounted for in the data presented in

these chapters. The report is structured as follows. Chapter 1 provides an overview of the Maltese economy with a focus on the recent macroeconomic developments, both at a national and European level, with a focus also on the challenges surrounding the underlying Maltese macroeconomic environment. Chapter 2 presents an analysis of Malta's human capital, skills, and educational attainment. As the availability of appropriate human capital, skills and educational attainment play a central role in enhancing a country's current and future productivity levels. Chapter 3 presents the indicator and indices relevant to wages and productivity with a specific focus on research, innovation and digitalisation. Chapter 4 provides an econometric model to assess the relationship between wages and productivity. Chapter 5 presents a list of ten recommendations emanating from the analysis carried out in this report, as well as an assessment of the progress on the National Productivity Board's past recommendations relating to the thematic area of wages and productivity.

CHAPTER 1: DEVELOPMENTS IN MALTA'S COMPETITIVENESS AND PRODUCTIVITY

1.1 Macroeconomic trends

In this section, we provide an analysis of Malta's macroeconomic performance in recent years. Additionally, this section gives an in-depth analysis of how the Maltese economy has been affected by the COVID-19 pandemic and the conflict between Russia and Ukraine, as well as the subsequent consequences of these events and mitigation measures to achieve economic recovery.

1.1.1 Gross Domestic Product

Malta's economy has been registering significant and sustained growth in recent years, mainly driven by domestic demand and export of services, including tourism. This growth trajectory was suddenly disrupted by the occurrence of the COVID-19 pandemic, in March 2020. The pandemic negatively impacted economic activity both locally and at the international level. Indeed, in the period 2011-2019, Malta's real Gross Domestic Product (GDP) growth averaged 6.1% as opposed to an average growth rate of 1.5% for the 27 European Union (EU27) countries.

As the Maltese economy is an open economy and highly dependent on the tourism sector, Malta's economy was hit hard in 2020. The Maltese economy contracted by 8.6% in 2020 relative to the EU27 average contraction of 5.6%. Once the pandemic-related restrictions eased in 2021, the Maltese economy recovered strongly, such that pre-pandemic GDP levels were exceeded. In 2021, Malta recorded real GDP growth of 11.7%, more than double the EU27 average of 5.6% (see Figure 1.1.1).

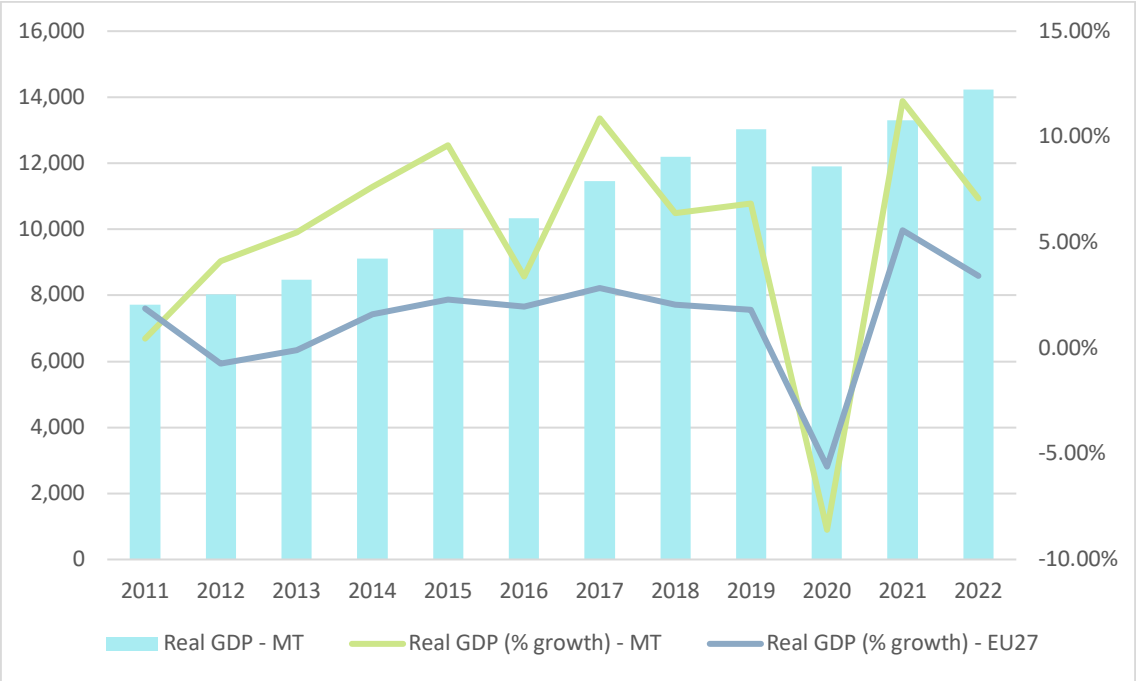

FIGURE 1.1.1 REAL GDP IN LEVELS AND GROWTH RATE *(SOURCE: EUROSTAT, 2023)*

In February 2022, due to Russia's invasion of Ukraine, the downside risk in economic growth in Europe increased substantially, due to Europe's high dependency on Russian energy resources and the dependency on various agricultural and food products from Ukraine. However, in 2022, Malta registered a real GDP growth of 7.0% while, the EU27 registered a real GDP growth of 3.4%. In May 2023, the European Commission issued its Spring 2023 Economic Forecast, in which it reported that the European economy has been successful in managing the adverse effects, primarily the energy crisis through the rapid diversification of supply and a significant decrease in gas usage.

In the pre-pandemic period, 2011-2019, private consumption was one of the leading drivers of economic growth. On the onset of the COVID-19 pandemic, households significantly decreased the level of private consumption, as consumers were less willing to spend or limited by store closures and restrictions to their movement[1]. In 2020, even the net exports contributor to the economy contracted Malta's economic growth, in fact, the only contributor

[1] *Statistical insights: How did the first wave of the COVID-19 pandemic ...* Available at: https://www.oecd.org/sdd/na/statistical-insights-how-did-the-first-wave-of-the-covid-19-pandemic-affect-the-household-sector-and-public-finances.htm

which grew was government expenditure resulting from the COVID-19 measures implemented during the year. In the subsequent year (2021), the economic recovery from the pandemic was mainly due to the recovery in private consumption and investment. Such a recovery was mainly possible due to the extensive government support offered to the private sector during the pandemic, which safeguard the structures within the economy. In 2022, the economy grew by 7%, mainly from private consumption and investment. These two components offset the negative change in net exports resulting from higher imports and lower exports (see Figure 1.1.2).

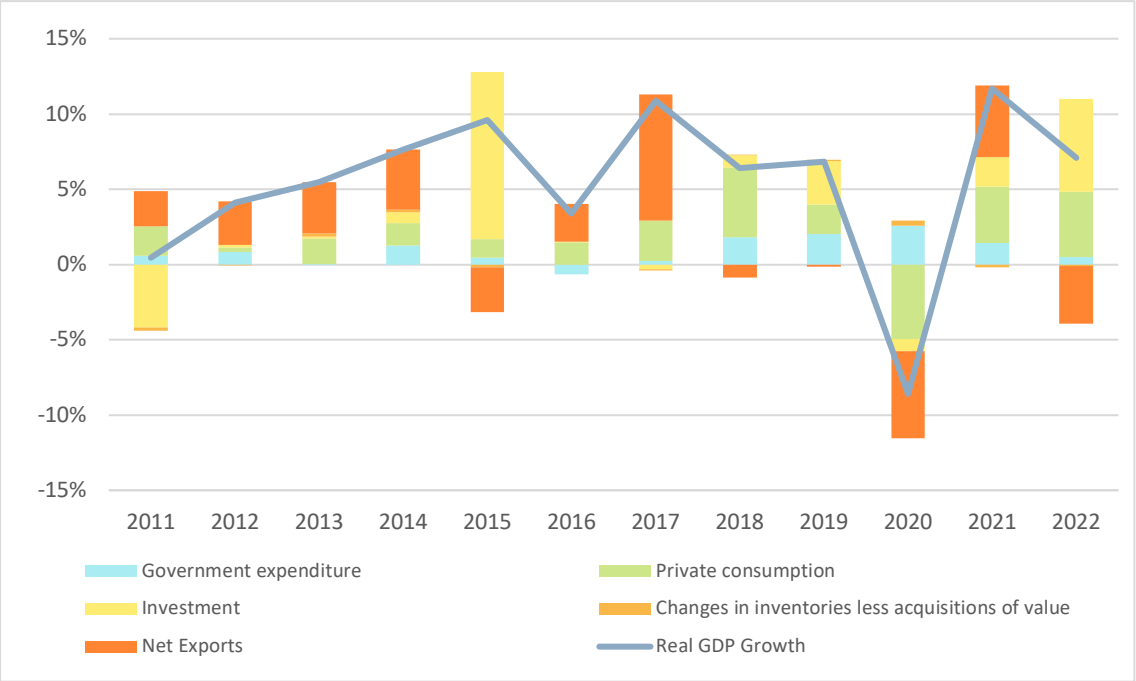

FIGURE 1.1.2 REAL GDP AND ITS MAIN COMPONENTS (*SOURCE: EUROSTAT,2023*)

1.1.2 Employment rates

Malta's improvement in economic performance is also reflected in the employment rates. Indeed, employment rates have been outperforming the EU27 average since 2014 and in fact, Malta's employment rate in 2022 stood at 81.1% whilst the EU27 employment rate was at 74.6% (see Figure 1.1.3).

The mentioned substantial increase in economic growth is expected to lead to an elevated demand for workers. This was partially met by a set of effective labour market policies introduced in 2014 which encouraged women to join the labour force by providing free childcare services and other active labour market policies. Moreover, the remaining unmet demand for workers from such labour market policies resulting in an unprecedented increase in foreign workers. Such a substantial increase (population as end 2022 stood at 542k) in population is resulting in a heavy strain on Malta's infrastructure across the board. The challenge going forward will be on how policy makers will provide incentives to have businesses adopt and increase the uptake of technology that reduces the need for workers and upskill workers to increase their productivity.

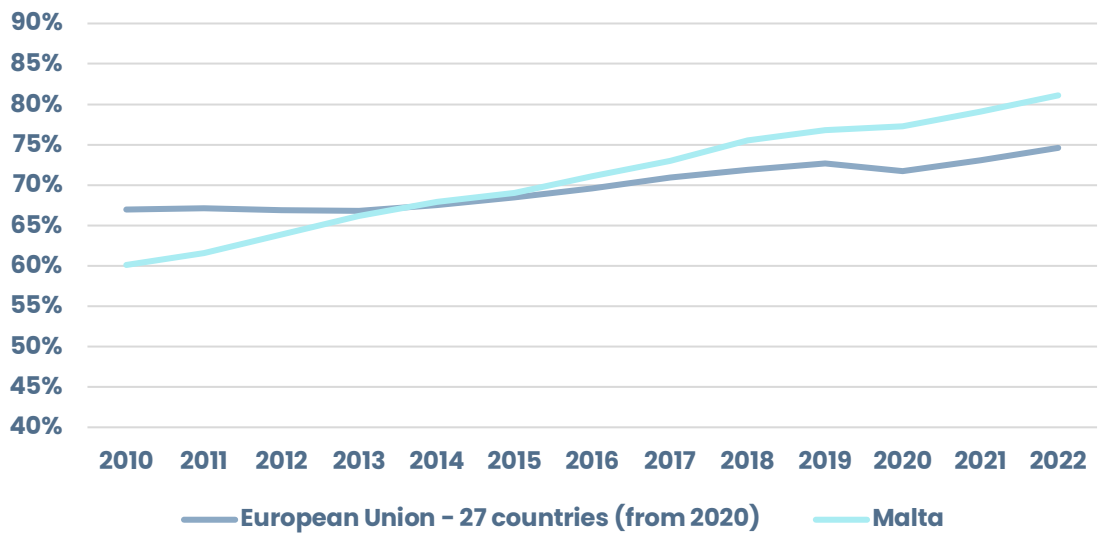

FIGURE 1.1.3 EMPLOYMENT RATES (%) (*SOURCE: EUROSTAT,2023)*

On the other hand, since 2010 unemployment rate was on a downward trend, with a slight increase during the COVID-19 pandemic. In fact, in 2022, the unemployment rate in Malta reached its lowest rate (2.9%) since 2010. This can be attributed to the incentives government provided businesses during the covid-19 pandemic to maintain their employees in employment. Malta's unemployment rate has consistently been below the EU27 average (see Figure 1.1.4).

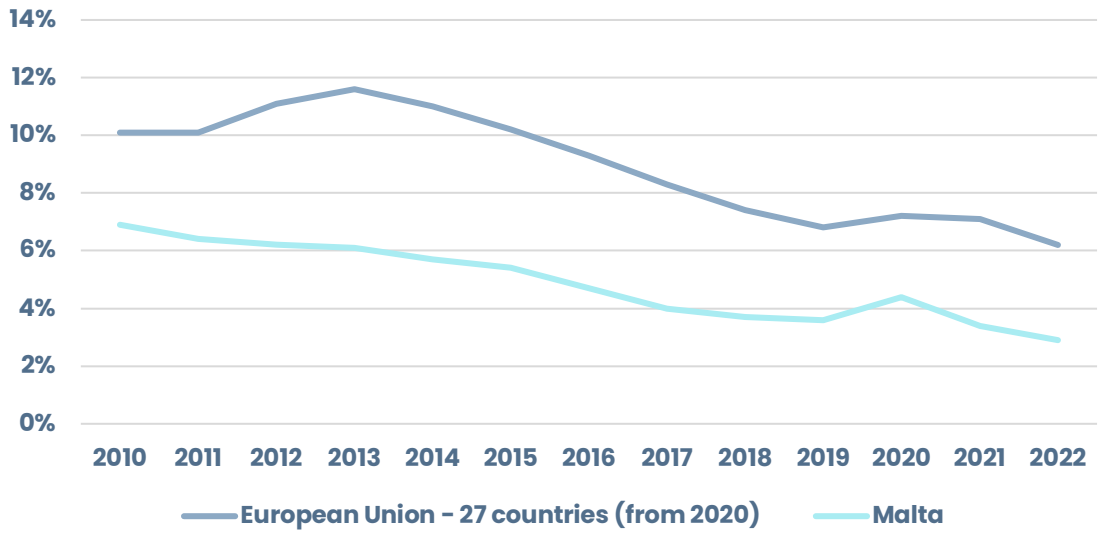

FIGURE 1.1.4 UNEMPLOYMENT RATES (%) (*SOURCE: EUROSTAT,2023*)

1.1.3 Public Finances

A pivotal element of macroeconomic stability is fiscal discipline. In fact, several institutional arrangements for sound policies have been agreed to at the EU level.

The low debt to GDP ratio at the beginning of 2020, was useful at times of crises created by the COVID-19 pandemic and the subsequent conflict between Russia and Ukraine. In March 2020, the European Commission activated the general escape clause within the Stability and Growth Pact (SGP), effectively suspending the Maastricht criteria requirements, specifically those limiting government finances[2]. This allowed for the government to issue emergency measures in response to the COVID-19 pandemic and the conflict between Russia and Ukraine. Indeed, through the various government expenditure and the different budgetary measures, the government managed to safeguard employment and helped soften the impact of both the COVID-19 and the war in Ukraine. As a result of these measures, the fiscal budget swung back to significant budget deficit, however this deficit has been gradually decreasing since 2020 (see Figure 1.1.5).

[2] The annual government deficit must not exceed 3% of GDP and the Government debt must not exceed 60% of GDP.

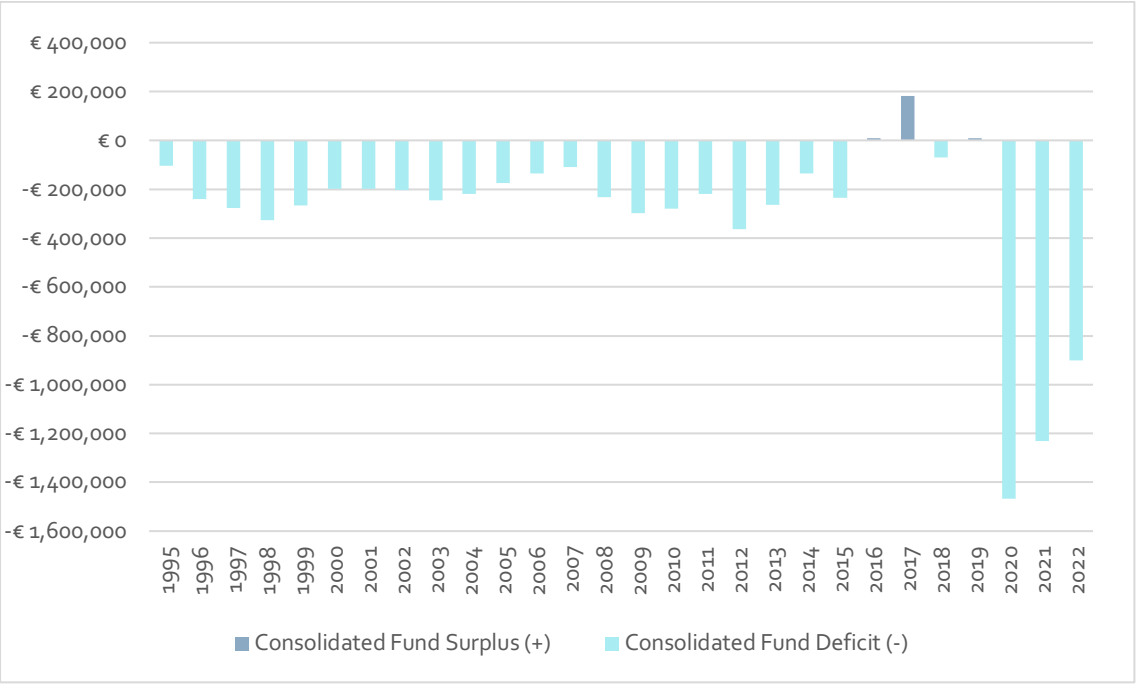

FIGURE 1.1.5 GOVERNMENT DEFICIT VS SURPLUS (*SOURCE: NSO,2023*)

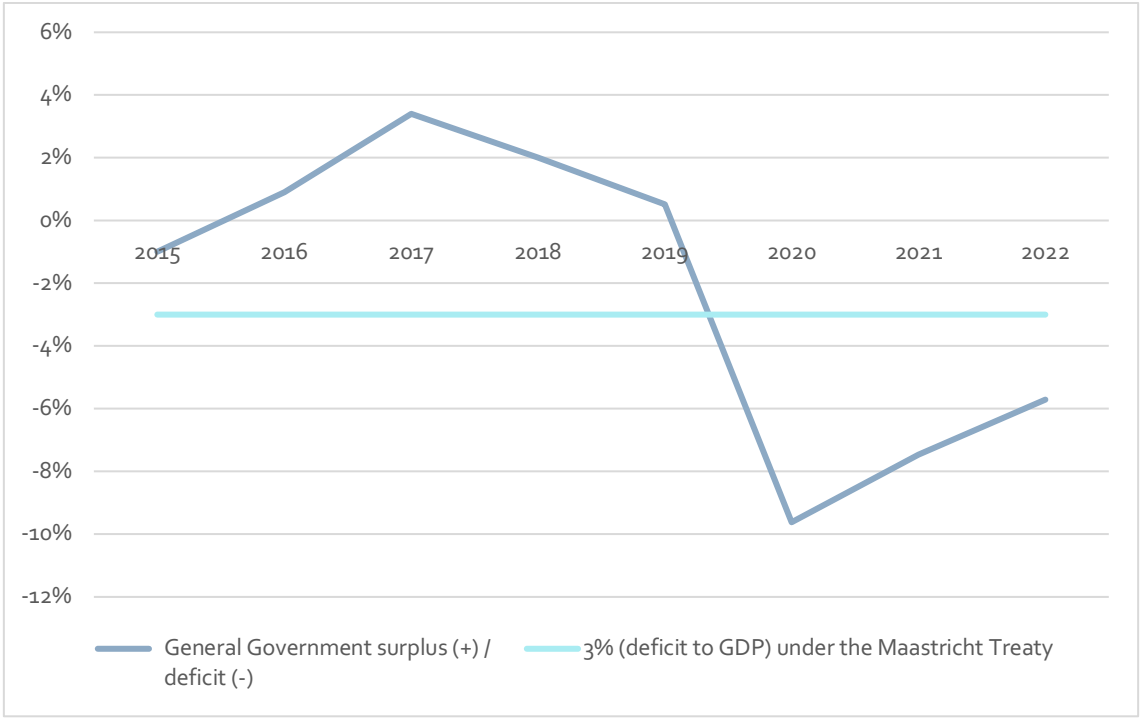

FIGURE 1.1.6 GENERAL GOVERNMENT SURPLUS (+) / DEFICIT (-)

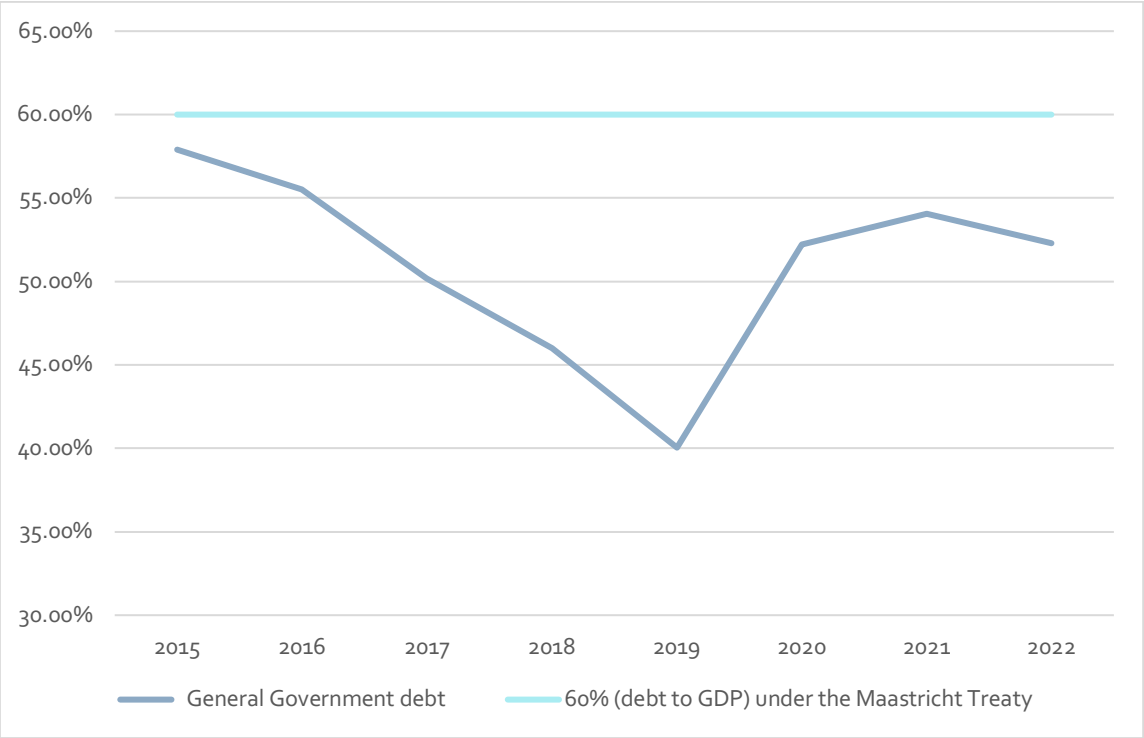

FIGURE 1.1.7 GENERAL GOVERNMENT DEBT AS A PERCENTAGE OF GDP

1.1.4 Inflation

The COVID-19 pandemic and the geopolitical conflict between Russia and Ukraine have had significant and varied impacts on economies and economic growth. The pandemic's global spread led to widespread lockdowns, business closures, and disrupted supply chains, causing a global recession. Sectors like travel, hospitality, and retail suffered, while digital technologies and remote work gained prominence.

In contrast, the Russia-Ukraine conflict raised concerns about trade disruptions, investment confidence, and the effects of economic sanctions. The conflict's proximity to energy supply routes and infrastructure also posed potential challenges. The war in Ukraine resulted in an energy crisis. As a result, the government of Malta introduced an energy subsidy to counter the high cost of energy prices. However, such energy subsidies are putting a strain on government's fiscal sustainability, therefore the emphasise should shift towards achieving a prudent medium-term fiscal position. Therefore, as outlined in the February 2023 IMF report for Malta "the authorities should prepare an exit strategy from the fixed-energy-price policy while protecting vulnerable groups. The exit strategy should aim to contain fiscal costs and

introduce market price mechanisms to enhance incentives for energy conservation and help accelerate the green transition while protecting vulnerable groups". Finally, any potential savings from energy subsidies or higher than projected revenue should be used to rebuild fiscal buffers.[3] Notwithstanding the above, it is Government Policy to keep subsidising energy and fuel costs for the foreseeable future, in an attempt to curb inflation.

As these disruptions were spreading worldwide some factors hinged the competitive position of Malta. Indeed, Malta's inflation rates, as recorded by the Harmonised Index of Consumer Prices (HICP) remained below the EU27 average. In fact, when comparing inflation from June 2022 to 2023, Malta recorded a slightly lower inflation rate of 6.2%. At the same time, the highest inflation rate was recorded by Hungary (19.9%) (see Figure 1.1.6). Taking a more detailed look into each constituent element that contributes to the HICP measure, in June 2023, the highest recorded inflation was in food and beverages (11.8%) for Malta. This was due the fact that food and beverages are highly dependent on raw materials whose prices are affected by the Ukrainian conflict. Also, the production of food and beverages is highly dependent on the cost of energy, which increase significantly during the said conflict (See Figure 1.1.7).

By analysing core inflation, specifically HICP for all items excluding energy and unprocessed food allows for an assessment of the fundamental inflationary trend by eliminating the influence of highly volatile components. In October 2022, Malta had a higher core inflation rate (7.6%) compared to the Euro Area Average (EA) (6.4%) for all items excluding energy and unprocessed food. By October 2023 we can see that the headline inflation in Euro Area inflation for October 2023 stood at 2.9% whilst in Malta this stood at 4.3%. However, if one where to dig deeper and look at elements of the core inflation, we see that the EA inflation for October 2023 when excluding energy stood at 4.9% and when excluding energy and food this stood at 4.2%, whilst in Malta these stood at 4.6% and 3.8% respectively. This indicates that when looking at elements of the core inflation, especially when comparing the HICP

[3] https://mfac.org.mt/wp-content/uploads/2023/06/MFACs-Assessment-of-the-Update-of-the-Stability-Programme-23-26.pdf

based inflation after excluding energy, Malta has been having an inflation rate just below the Euro area average in 2023 as can be seen from Figure 1.1.8 below.

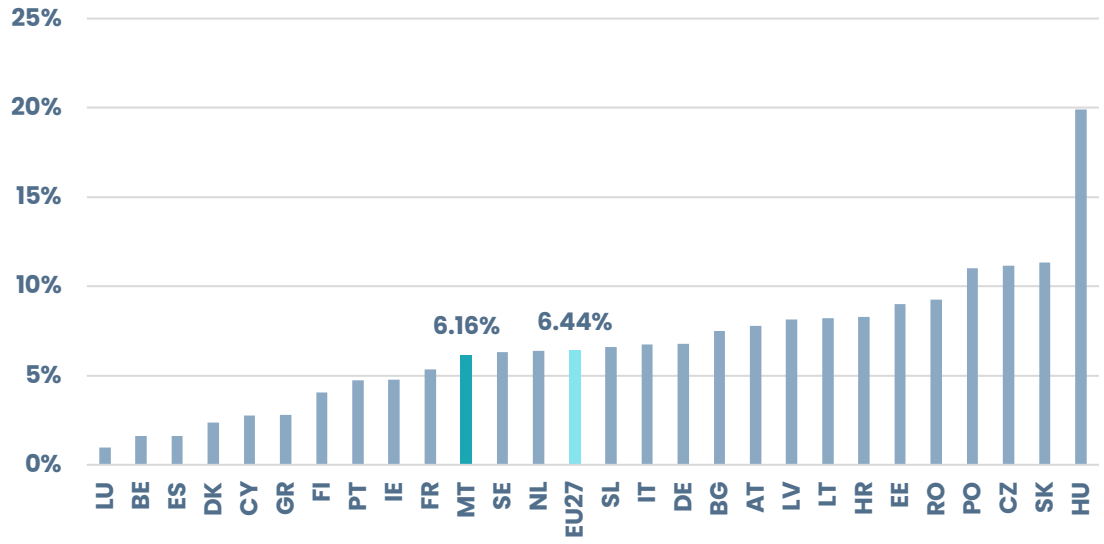

FIGURE 1.1.6 HARMONISED INDEX OF CONSUMER PRICES (*SOURCE: EUROSTAT,2023*)

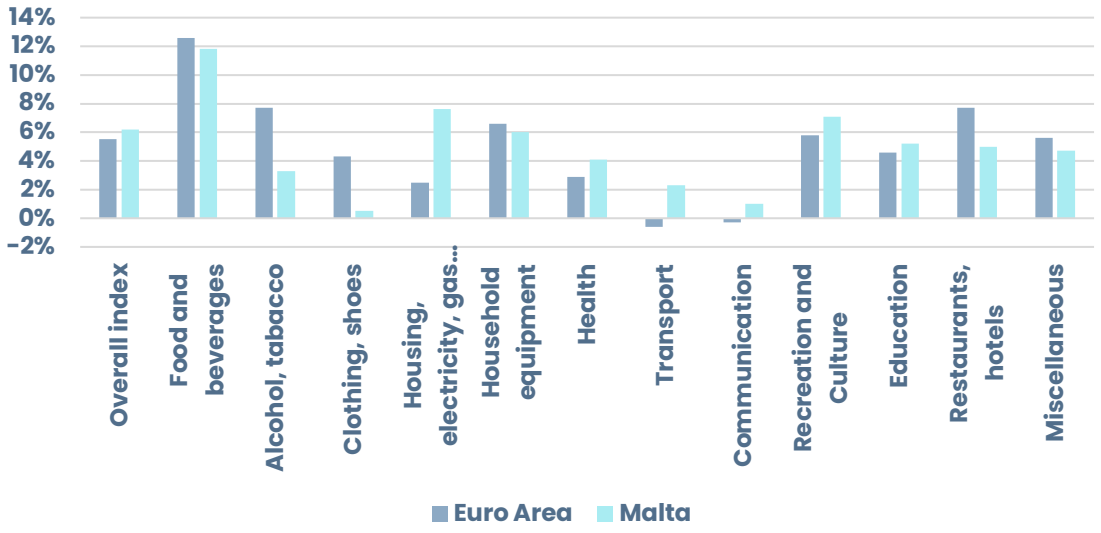

FIGURE 1.1.7 HICP BY COMPONENT EU27 AND MALTA, JUNE 2023 (*SOURCE: EUROSTAT,2023*)

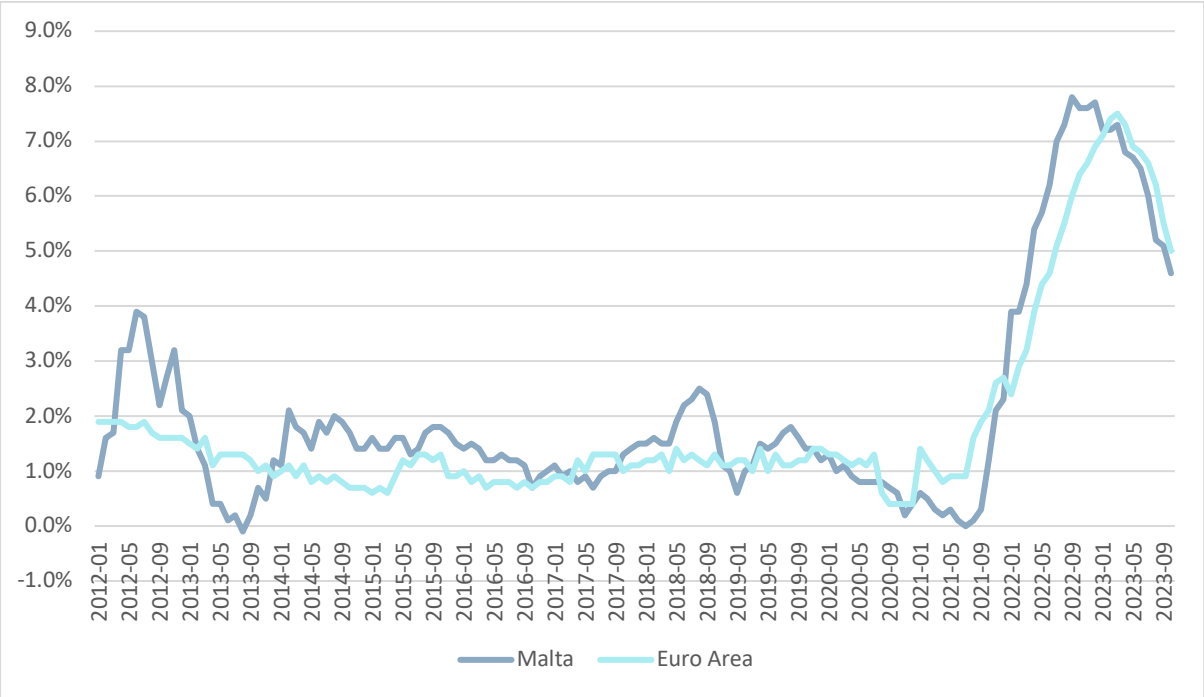

FIGURE 1.1.8 HICP - ALL-ITEMS EXCLUDING ENERGY AND UNPROCESSED FOOD, PERCENTAGE CHANGE *(SOURCE: ECB,2023)*

1.2 Sectoral Contributions Analysis

1.2.1 Sectoral contributions to GVA

The Gross Value Added (GVA) metric assesses the different sectors contribution to the Maltese economy. It validates that the 'Wholesale and retail trade, transport, accommodation, and food service activities', 'information and communication activities' and the 'Professional, scientific, and technical activities; administrative and support service activities' are the sectors contributing the most in terms of value added to the Maltese economy.

The COVID-19 pandemic has negatively impacted certain economic sectors, mainly those which are sensitive to economic cycles, such as the 'Wholesale and retail trade, transport, accommodation and food service activities.' It is important to note that in 2020, the GVA of other sectors, such as 'information and communication activities' and the Arts (mainly

iGaming) industry still grew and contributed positively to GVA. In the subsequent years (2021 and 2022) all sectors contributed positively to real GVA growth. (See Figure 1.2.1).

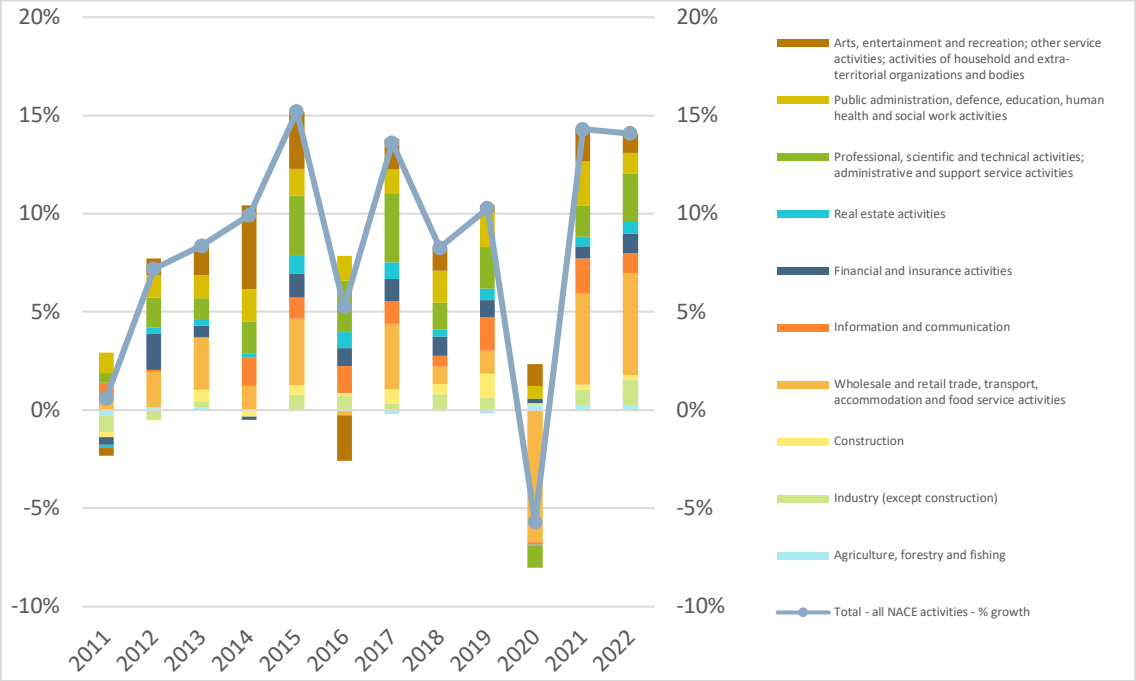

FIGURE 1.2.1 CONTRIBUTION TO REAL GROSS VALUE ADDED BY SECTOR *(SOURCE: EUROSTAT,2023)*

In addition, from the GDP calculations we can determine the split between who benefits the most from economic growth in a country. Figure 1.2.2 shows the economic growth cycle and calculate the difference between the gross operating surplus and mixed income (real adjusted) and the compensation of employees (real adjusted).

The shaded areas show the beneficiaries of economic growth which are mainly businesses and employees. In terms of benefits for businesses this analysis takes into consideration gross operating surplus & mixed income (in simple terms profits) while for employees the benefit relates to the wages earned. The green shaded region representing the phase during which employees experience the most benefits (higher wage increases when compared to the increase in profits for businesses), while the red shaded area corresponds to the period when businesses reap the greatest advantages. Figure 1.2.2 highlights the inclination for businesses to profit more from positive economic cycles. However, in times of economic slowdown, such as the COVID-19 pandemic, it becomes increasingly probable that businesses suffer more than

employees. In 2020, Covid-19 hit, and the economy contracted sharply. During this year, business suffered the most as they registered a substantial decrease in profits while the wages remained relatively stable. In contrast, in the latter part of 2021 and 2022, when the economy started to recover, business benefited the most as they registered a high increase in profits, significantly higher than the increase in wages. Now it can be argued that government played a crucial role here with its wage supplement, however, this economic behaviour was also observed between 2009 and 2012, in the midst of the financial crisis. It is also important to note that between 2009 and 2012 the government at the time provided substantial aid to businesses.

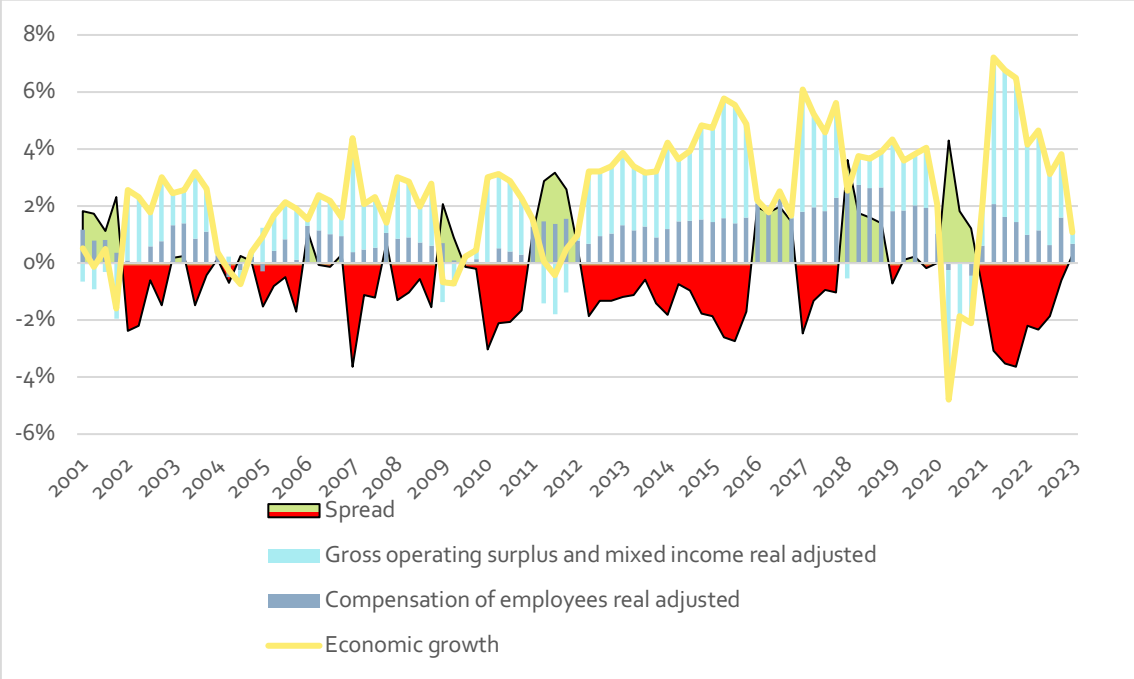

FIGURE 1.2.2 BENEFICIARIES OF ECONOMIC GROWTH BETWEEN BUSINESSES AND EMPLOYEES (*SOURCE: AUTHOR'S CALCULATIONS, 2023)*

In a more elaborate analysis, the calculations of GVA provide us with the means to ascertain who is benefiting from the generated profits.

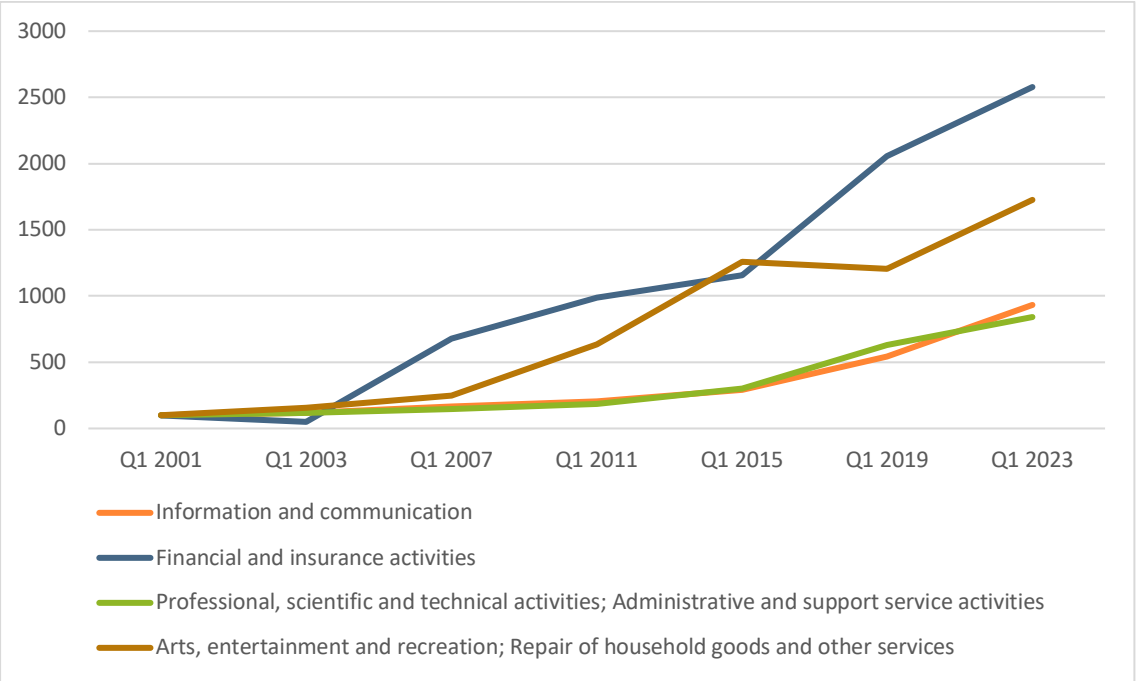

Figure 1.2.3 illustrates that since 2001, all sectors witnessed an upswing in profit generation; however, specific sectors have experienced a more pronounced acceleration in profits. Notably, the K: financial and insurance activities sector emerged as the primary beneficiary, displaying the highest gains over the past decade. Subsequently, the J: information and communications sector also demonstrated substantial profit growth during this period.

Particularly between 2019 and 2023, the profits within the information and communications sector underwent an impressive expansion of 72%. Another sector that is rapidly gaining traction in terms of profitability is the R to U: Arts, Entertainment, and Recreation sector, which encompasses industries which includes the iGaming sector. This specific sector exhibited a notable growth of 43% in profits between 2019 and 2023.

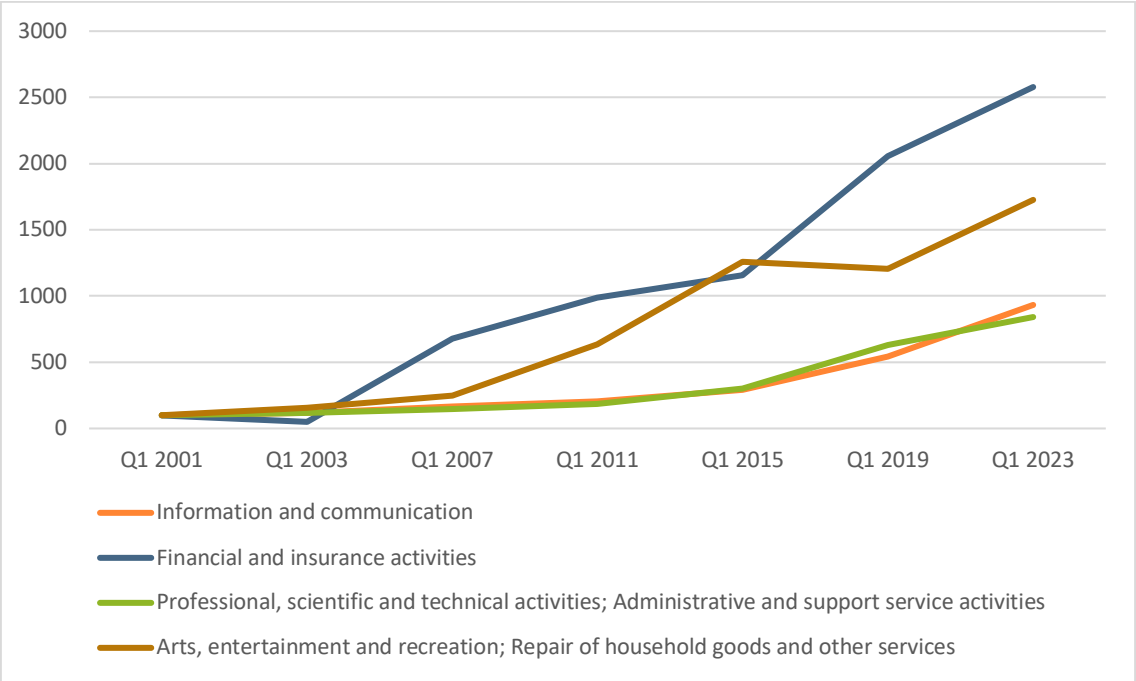

FIGURE 1.2.3 PROFITS GENERATED GROWTH, BASE YEAR Q1 2001 = 100 (*SOURCE: NSO & AUTHOR'S CALCULATIONS, 2023*)

The allocation of profits between businesses and employees varies across sectors. A detailed examination of this distribution reveals that different sectors exhibit differing patterns in how profits are shared (see Figure 1.2.4). For clarity, a figure of 0.6 means that out of every €100 in GVA generated, €60 is taken as profits by businesses while €40 are taken by employees as wages. In some sectors, businesses tend to retain a larger proportion of the profits, while in others, employees receive a more substantial share. For instance, in sectors characterised by high capital intensity and specialised skill requirements, such as technology and finance, businesses may retain a larger share of profits due to the significant investments in infrastructure, research, and development.

In fact, the B to E: Mining and quarrying; Manufacturing; Electricity, gas, steam, and air conditioning supply; Water supply; sewerage, waste management and remediation activities retain most of the profits the businesses. On the other hand, sectors with a larger reliance on labour, such as K: financial and insurance activities allocate a relatively larger portion of profits to employees as wages.

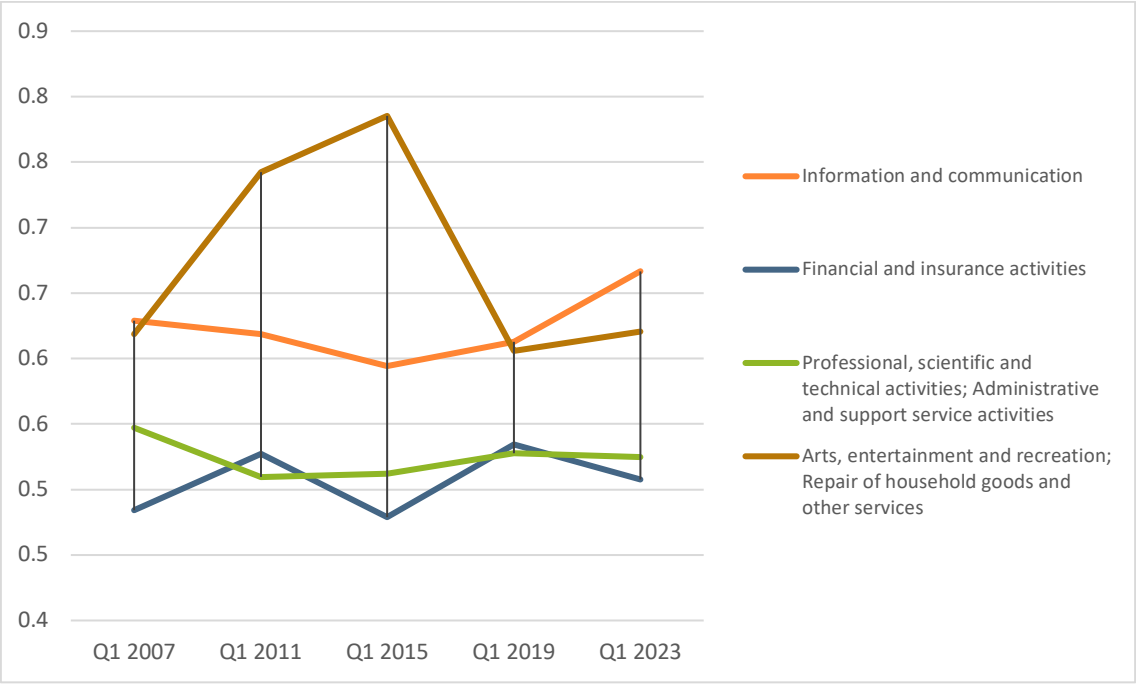

FIGURE 1.2.4 SHARE OF PROFITS, 1=ALL BUSINESSES, 0 = ALL EMPLOYEES *(SOURCE: NSO & AUTHOR'S CALCULATIONS, 2023)*

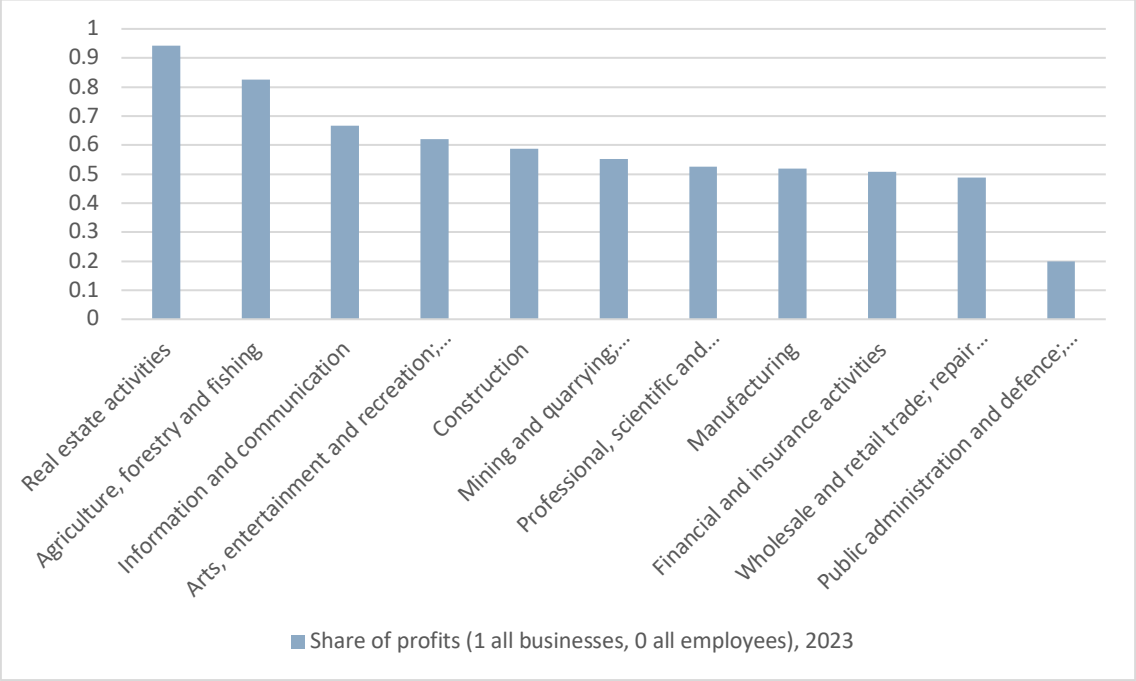

FIGURE 1.2.5 SHARE OF PROFITS, FOR Q1 2023 (SOURCE: NSO & AUTHOR'S CALCULATIONS, 2023)

1.2.1 International trade

The Maltese economy is one of the smallest open economies in the euro-zone, it relies heavily on international trade in both goods and services. Figure 1.2.6 shows the developments in the main components of Malta's current account within the Balance of Payments (BoP), between 2017 and 2022. Over the years, Malta recorded growing surpluses mainly due to the growing industries including the iGaming and tourism. During the pandemic the services sector remained in a positive trade balance, however, compared to previous the year (2019) it contracted. In 2021 and 2022, the services sector improved and even exceeded pre-pandemic balances, however this has been mostly outweighed by the increasingly negative trade balance in the goods market, mainly because of the conflict between Russia and Ukraine. This trend seems to be persistent even in the second quarter of 2023, the current account reported a trade deficit.

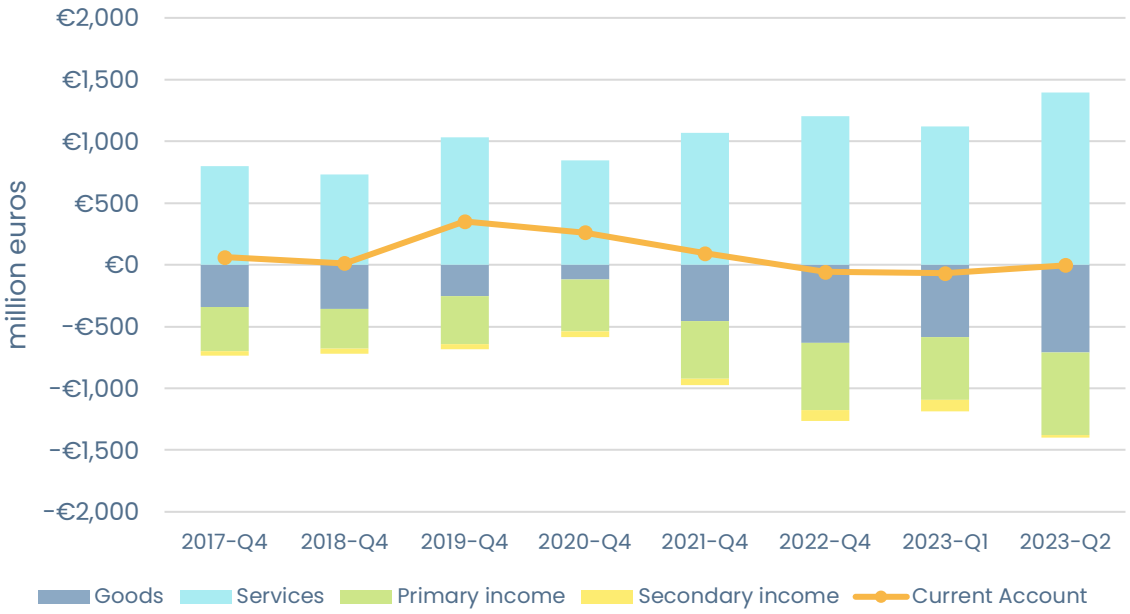

FIGURE 1.2.6 CURRENT ACCOUNT BALANCE AND MAIN COMPONENTS *(NSOT,2023)*

Looking in detail into the international trade of Goods, Malta's exports play a vital role in a country's economic growth and development. Exports contribute to GDP growth and

generate revenue. Moreover, it is one of the best measures of assessing external competitiveness. Malta exported most of its goods to the EU as can be seen in Figure 1.2.7.

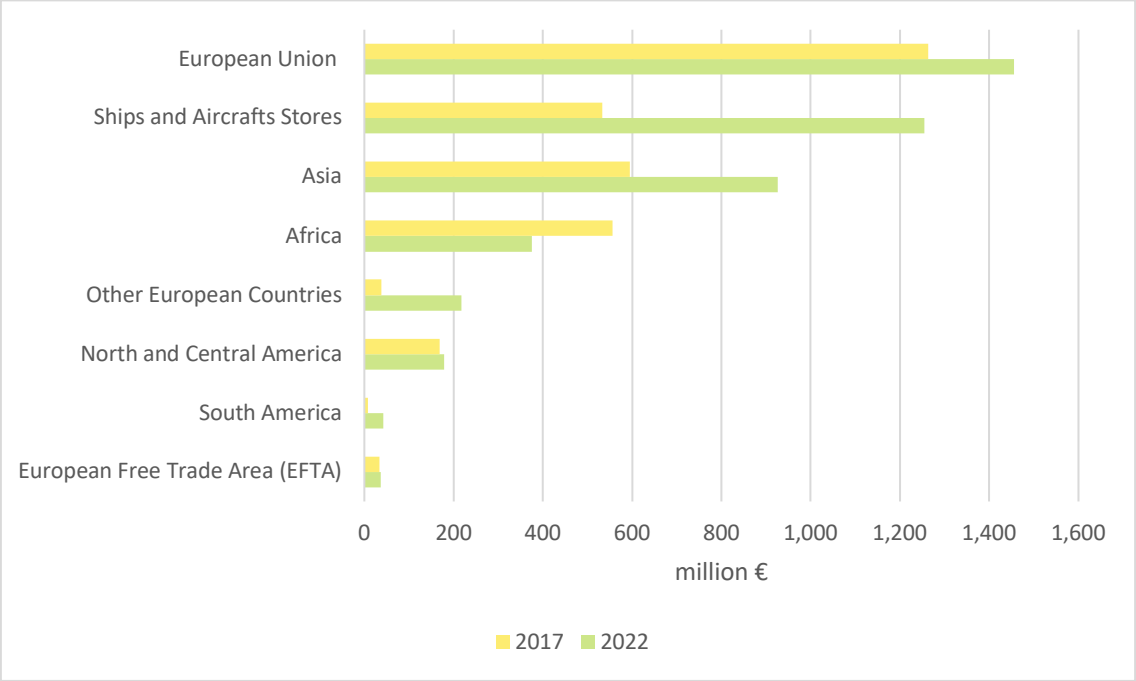

FIGURE 1.2.7 EXPORTS BY REGION *(SOURCE: NSO,2023)*

The shift-share analysis shows the economic growth of Malta and compares it to an economic block, in this case the European union to provide insights into the changes in competitiveness. By decomposing the change in value added, it is evident that the total growth in value added between 2011 and 2021 is trending upwards, except for 2020. The Shift-share analysis, the term 'shift' refers to changes in economic activity, and 'share' pertains to the relative proportion of that activity within a specific region (in this case Malta) (see Figure 1.2.8). The upward trend line (the differential shift component) reflects Malta's competitiveness gains overtime (see Figure 1.2.9).

This analytical framework integrates and aligns with a comprehensive evaluation of Malta's competitiveness landscape, utilising the Ease of Doing Business (DB) score, administered by the World Bank, which is analysed in more detail later on in this report. Malta's ranking at the

88th place out of 190 economies in the ease of DB score provides insights into the regulatory environment and business practices. Mainly, improvements in categories such as securing credit and business initiation correlate with Malta's positive economic trajectory, establishing a link between economic growth and the fostering of business opportunities, all of which are contributing to the increase in competitiveness as highlighted in figure 1.2.9 below.

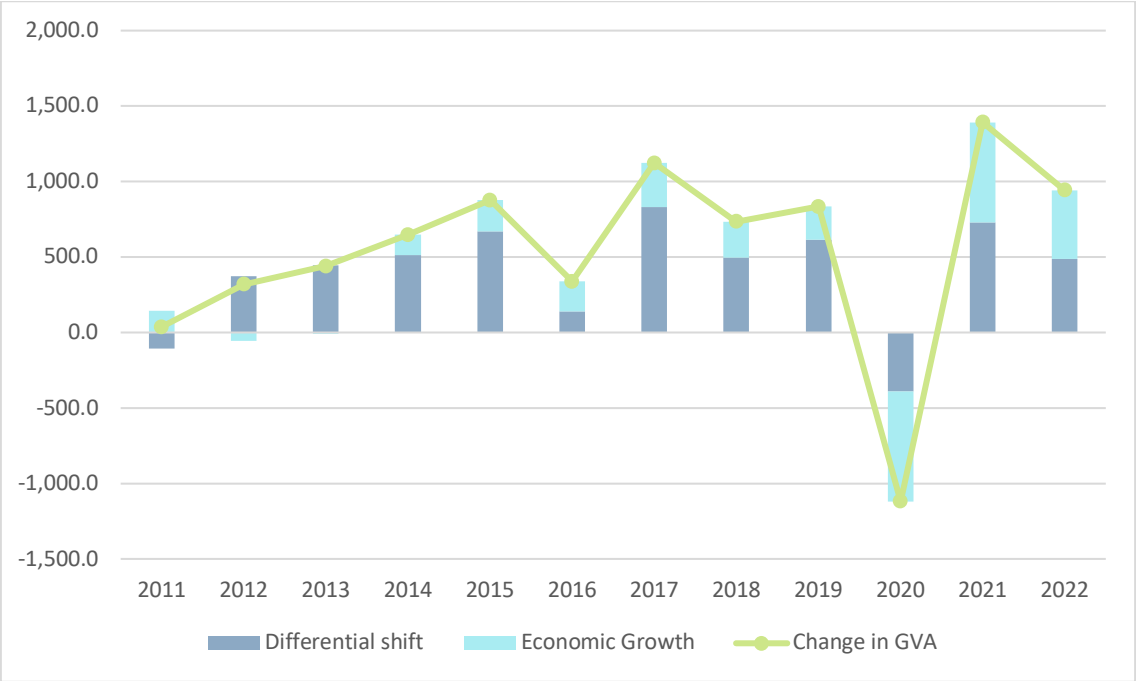

FIGURE 1.2.8 DECOMPOSING THE CHANGE IN GVA *(SOURCE: EUROSTAT & AUTHOR'S CALCULATIONS, 2023)*

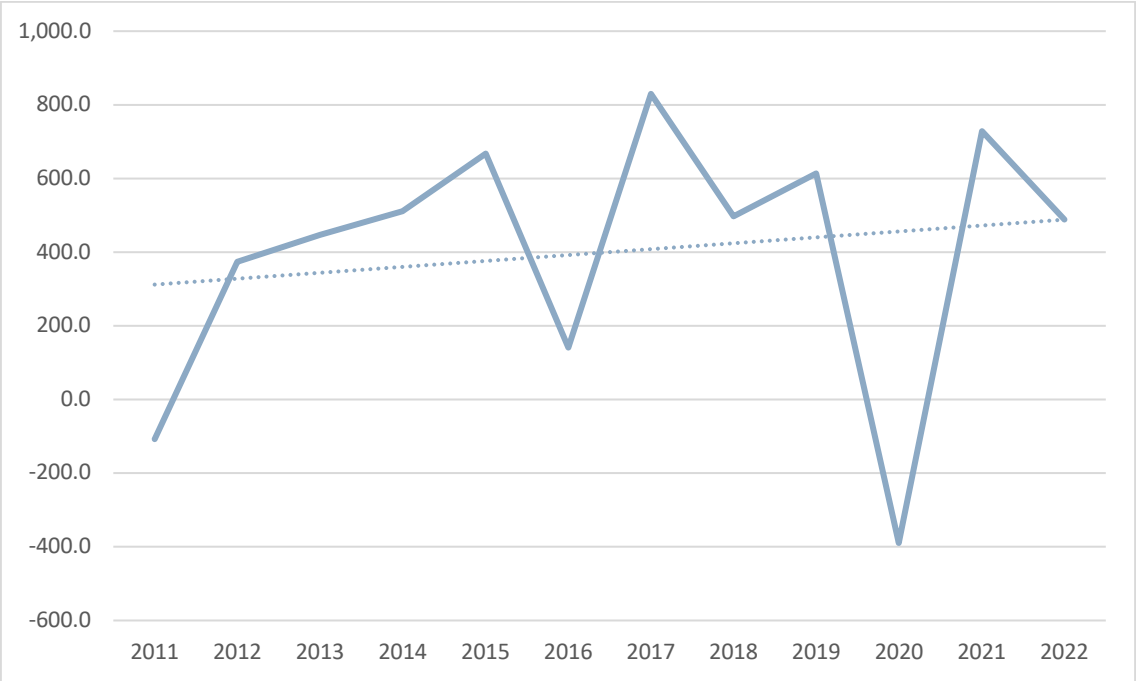

FIGURE 1.2.9 MEASURE OF COMPETITIVENESS *(SOURCE: EUROSTAT & AUTHOR'S CALCULATIONS, 2023)*

1.3 Labour productivity

Labor productivity plays a significant role in driving economic growth and enhancing a country's competitiveness in the global marketplace. Comparing the real labour productivity per hour worked of Malta with the EU27 average, it seems that Malta is lacking slightly behind the EU27 average. In particular, the convergence of labour productivity observed between 2015 and 2017 seems to have embarked on a trend reversal in the following years as economic growth became more labour intensive and required a greater influx of labour resources. The below Figure 1.3.1 was indexed to the year 2015. For the EU27 labour productivity increased gradually over the years, reaching its peak at 106.3 in 2022. This indicates that by 2022, labour productivity in the EU27 had increased to a level that was 6.3% higher than the base year 2015. Similarly, to the EU27, labour productivity in Malta also increased over the years and reached 103.3 in 2022. This indicates that by 2022, labour productivity in Malta had increased to a level that was 3.3% higher than the base year 2015. Thus, by 2022, both the EU27 and Malta had labour productivity levels higher than the base year (2015).

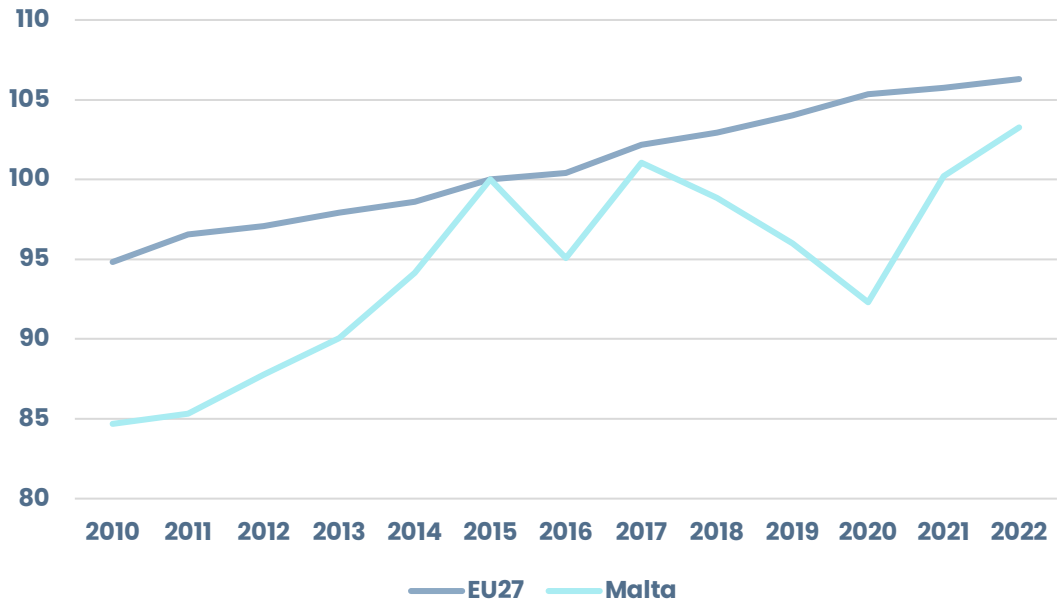

FIGURE 1.3.1 REAL LABOUR PRODUCTIVITY PER HOUR WORKED (BASE YEAR 2015=100) *(SOURCE: EUROSTAT,2023)*

Furthermore, in this context sectoral contributions refers to the individual contributions of different sectors or industries to the overall productivity of an economy. To derive the average productivity measure per employee for each sector, one need to divide the GVA generated from each economic sector by the total number of Full-Time Equivalent (FTE) employees in that sector. Looking at Figure 1.3.2 indexed to year 2013, the information and communication, consistently showed higher productivity. Comparing 2022 to the base year (2013), GVA per employee grew by 79% for the information and communication sector.

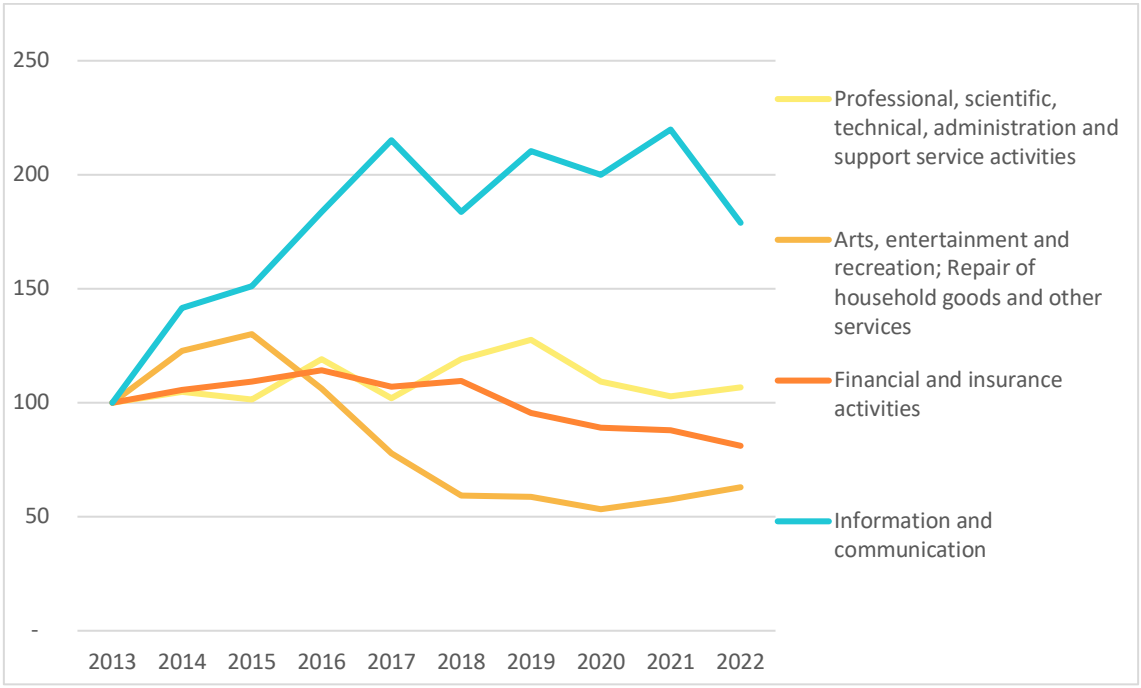

FIGURE 1.3.2 GVA PER EMPLOYEE, INDEXED TO BASE YEAR 2013 *(SOURCE: NSO & AUTHOR'S CALCULATIONS, 2023)*

Table 1.3.1 shows Malta's top performing sectors, in absolute terms, the real estate activities, generate the most[4], with a total GVA of €190,109 per employee in 2022. The second-best performing sector is the information and communication sector which generated a GVA per employee of €98,317 in 2022. Other top-performing sectors in 2022 include the financial and insurance sector (€64,231) and the Arts, entertainment, and recreation; Repair of household goods and other services (€58,508). However, when comparing the growth rate of these top-performing sectors it seems that productivity in recent years is dropping.

TABLE 1.3.1 GVA PER EMPLOYEE (PRODUCTIVITY) (SOURCE: NSO & AUTHOR'S CALCULATIONS,2022)

	2013	**2022**	**Growth, 2013-2022 (%)**
Agriculture, forestry, and fishing	€ 30,099	€ 68,532	127.7%[5]

[4] However, the total GVA per employee for real estate activities might be skewed due to the different market dynamics, inclusion of part-time or contract employees and the distorted effect of imputed rent.
[5] This growth rate can be skewed due to factors such as unregistered and informal workers, the challenging nature of the work, seasonal employment, subsistence farming practices, lack of modernisation, and difficulties in data collection.

Construction	€ 28,274	€ 28,675	1.4%
Financial and insurance activities	€ 79,188	€ 64,231	-18.9%
Information and communication	€ 54,958	€ 98,317	78.9%
Manufacturing, mining and quarrying and other industry	€ 29,511	€ 35,770	21.2%
Arts, entertainment, and recreation; Repair of household goods and other services	€ 92,775	€ 58,508	-36.9%
Professional, scientific, technical, administration and support service activities	€ 61,615	€ 65,794	6.8%
Public administration, defence, education, human health and social work activities	€ 29,126	€ 27,125	-6.9%
Real estate activities	€ 316,569	€ 190,109	-39.9%
Wholesale and retail trade, transportation and storage, accommodation, and food service activities	€ 32,739	€ 34,681	5.9%

1.4 Key economic and competitiveness indicators

Two important tools used to assess and compare the business environment and competitiveness of Malta is through the ease of doing business score, issued by the World Bank and the Global Competitiveness Index (GCI), developed by the World Economic Forum. The Ease of Doing Business (DB) score focuses specifically on business regulatory practices, while the GCI takes a more comprehensive approach to assess overall competitiveness.

1.4.1 Ease of doing business score

The ease of DB score assesses and compare the regulatory environment and businesses in different countries. The score is calculated based on various indicators that reflect different

aspects of the business environment. These indicators cover a wide range of topics related to business regulations, such as starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts, and resolving insolvency. An economy's ease of doing business score is reflected on a scale from 0 to 100, the closer the score is to 100, the closer would that country be to the best performing country in each indicator. Malta ranked the 88th place[6] is the ease of doing business out of 190 economies. When comparing the scores from 2016 to 2020, Malta made improvements in most of the categories, most notably in respect to getting credit and starting a business which can be both linked to economic growth resulting in more opportunities. However, Malta slightly lost its relative standing in paying taxes and resolving insolvency (see Figure 1.4.1).

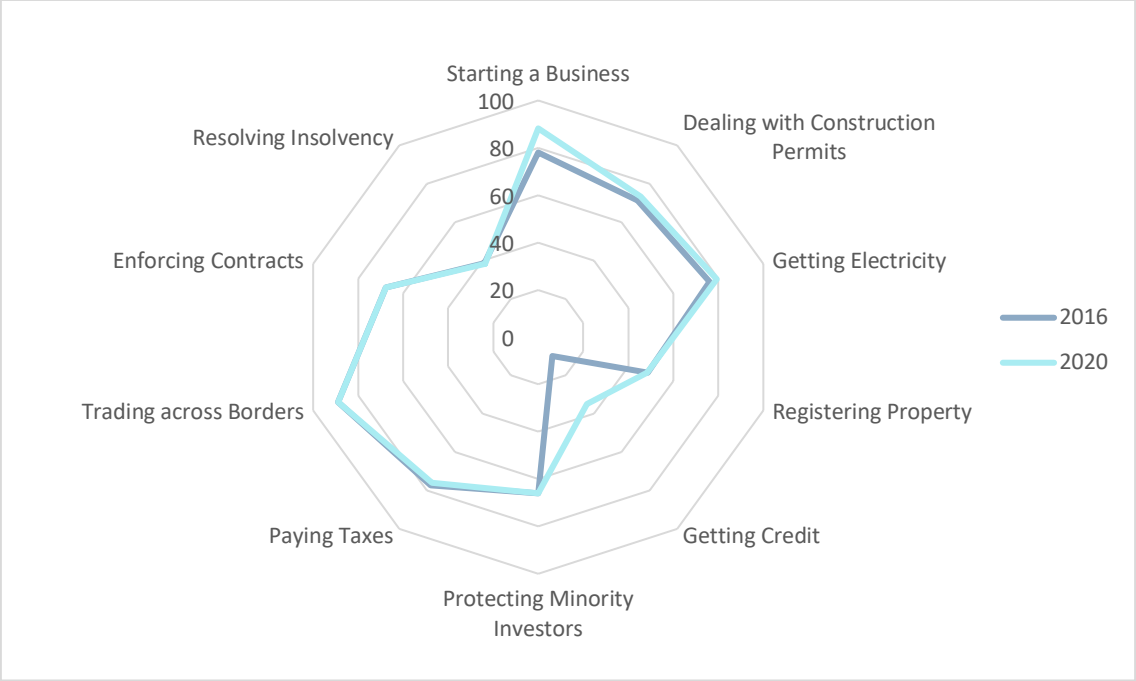

FIGURE 1.4.1 EASE OF DOING BUSINESS SCORE ACROSS TIME AND THE DIFFERENT INDICATORS *(SOURCE: WORLD BANK)*

[6] The rankings for all economies are benchmarked to May 2019

1.4.2 Global Competitiveness Index

The GCI, a highly comprehensive index, which captures the microeconomic and macroeconomic foundations of national competitiveness. The GCI is based on a comprehensive set of indicators that cover areas such as infrastructure, macroeconomic stability, health and education, innovation, technological readiness, market efficiency, and more. Each indicator is assigned a score on a predefined scale. The scores are usually normalised to a scale of 0 to 100, with higher scores indicating better performance. Then countries are ranked based on their GCI scores. Figure 1.4.2 illustrates Malta's rank between 2012 and 2019. However, in 2020, the traditional rankings of the GCI were temporarily halted. Instead, the focus was redirected towards a special edition that delved into the strategies for recovery and resurgence. This unique edition also explored the foundational elements required for a shift towards novel economic frameworks that harmoniously integrate the pillars of "productivity," "people," and "planet."

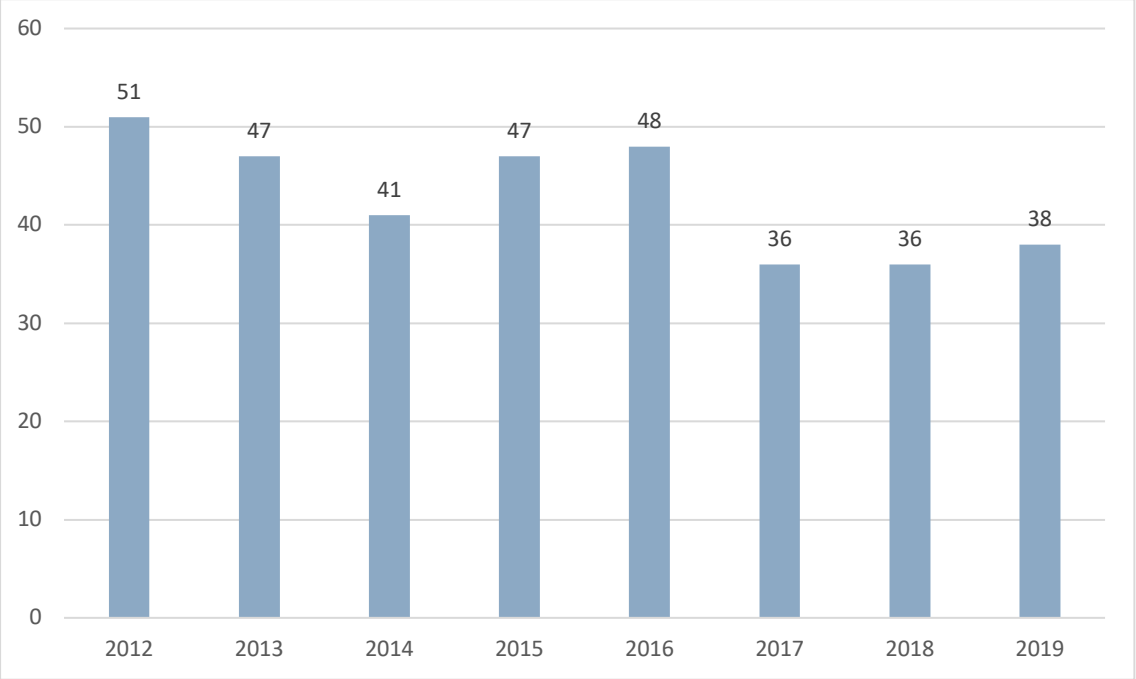

FIGURE 1.4.2 GLOBAL COMPETITIVENESS INDEX (*SOURCE: WORLD ECONOMIC FORUM*)

1.4.3 EU Competitiveness Agenda

Competitiveness is now high on the EU agenda. The them of competitiveness has been pushed by the European Economic and Social Committee. In its document entitled "Driving Prosperity for All", the key focus areas to drive competitiveness has been clearly outlined. These include:

- Competitive access to energy and raw materials which requires the strengthening of domestic production, ecosystems and resources & diversifying foreign suppliers, together with a general reconciliation between the various policy objectives and related regulation.
- Ensuring adequate labour and skills that is achieved through the facilitation of workforce mobility and migration, together with effective life-long learning systems and improved anticipation of future skills needs.
- A true fostering the Single Market through full implementation and enforcement of common rules and an avoidance of national deviations and new regulations conflicting with common rules.
- An EU foreign trade strategy based on avoiding critical dependencies on politically risky countries and enhancing cooperation and bilateral agreements with like-minded partners.
- All policy- and law-making in the EU should be guided by a competitiveness check to be embedded in the EU's decision-making processes. Such a competitiveness check would be based on a comprehensive assessment of competitiveness impacts and their proper consideration in deciding on new initiatives.
- The development of the EU's fiscal framework that ensures long-term economic sustainability and fiscal discipline. Any reforms must not lead to increased taxation, ineffective public spending or debt for future generations. To enhance economic sustainability, the tax system must be conducive to investments and entrepreneurship and encourage doing business and working.

1.5 Total Factor Productivity

The total factor productivity (TFP) is a metric which measures productivity across both factors of production, namely labour and capital. TFP is a crucial concept in economics that measures

the efficiency with which inputs are transformed into outputs in an economy. TFP growth is a key driver of long-term economic growth. As economies become more efficient in using their resources, they can produce more goods and services, leading to higher standards of living.

Figure 1.5.1 shows the movements in TFP over the period 2010 to 2022. Over the analysed period, Malta's TFP has lagged that of the rest of the EU, although it converged in 2015 and 2017-2019. Nevertheless, following the onset of COVID-19 Malta's TFP dropped sharply. Nonetheless, since the onset of COVID-19, it seems that TFP is recovering slowly in line with the EU27 trend. In 2022, Malta's TFP grew by 2.1 percentage points and the EU27 TFP grew by 1.6 percentage points.

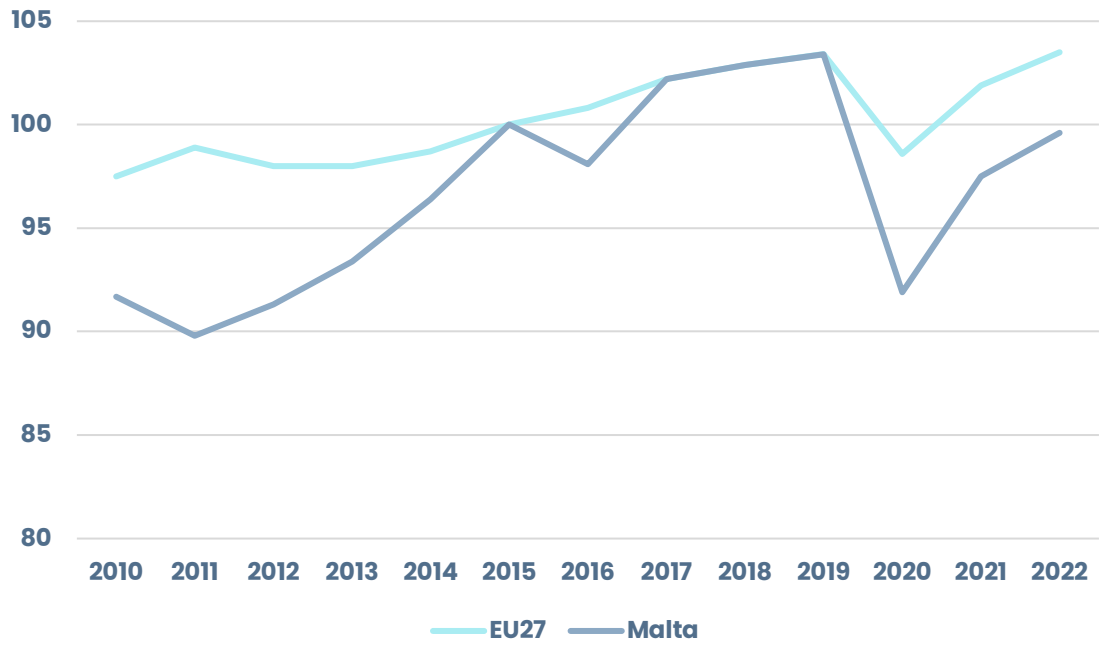

FIGURE 1.5.1: TOTAL FACTOR PRODUCTIVITY *(SOURCE: KLEMS, 2022)*

CHAPTER 2: HUMAN CAPITAL AND SKILLS

This section presents an analysis of Malta's human capital, skills, and educational attainment. It assesses Malta's competitiveness position and potential growth. The availability of appropriate human capital, skills and educational attainment play a central role in enhancing a country's current and future productivity levels. In this section, you will find a presentation of different indicators and indexes that assess Malta's standing in terms of human capital and skills and make comparisons with other EU counterparts.

2.1 Educational attainment

We begin by looking at the educational attainment levels in 2022 and compare Malta's levels with the rest of the EU27 countries. Figure 2.1.1 shows the distribution of the population aged 15 to 64 years by educational attainment level. The three levels of educational attainment are classified according to the International Standard Classification of Education (ISCED) 2011 as follows:

- Less than primary, primary, or lower secondary level of education (ISCED 2011 levels 0–2; hereafter referred to as a low educational attainment level or low level of education)

- Upper secondary or post-secondary non-tertiary education (ISCED 2011 levels 3 and 4; hereafter referred to as medium educational attainment level or medium level of education)

- Tertiary education (ISCED 2011 levels 5–8; hereafter referred to as a high educational attainment level or high level of education).

Figure 2.1.1 ranks the countries from left to right according to the less than primary, primary and lower secondary education (level 0-2), it shows that Portugal holds the highest level of

low educational attainment (39.6%) and the lowest level of low educational attainment is held by Lithuania (11.3%). Malta's low educational attainment level is of 33.1% which is above the EU27 average of 24.9%. This indicates that a larger portion of Malta's population aged 15 to 64 years has not completed basic primary and low secondary education compared to the EU27. With respect to medium and high educational attainment Malta's percentage out of the total population is below the EU average. The medium educational attainment level of Malta is of 38% which is 6.9 percentage points below the EU27 average of 44.9%. The high educational attainment level of Malta is of 28.9% which is 1.3 percentage points below the EU27 average of 30.2%. Hence, this data indicates that overall Malta has a higher percentage of its working-age population with lower levels of education compared to the EU27 average.

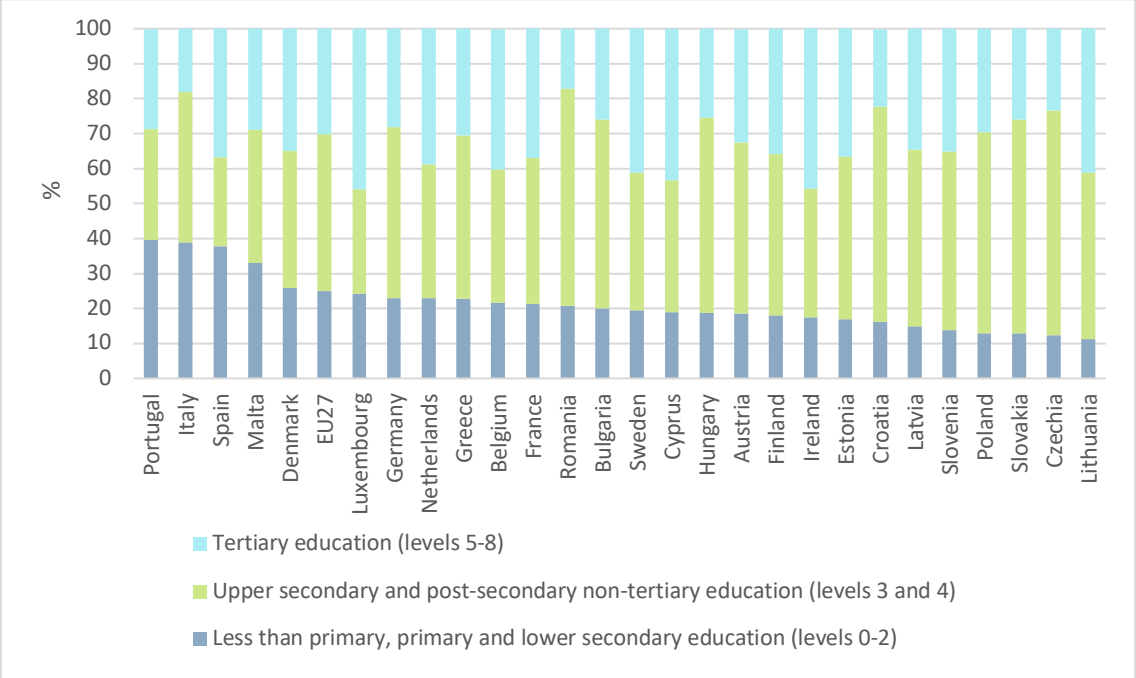

FIGURE 2.1.1 EDUCATIONAL ATTAINMENT LEVELS, 2022 (ISECD 2011) *(SOURCE: EUROSTAT, 2023)*

2.2 Early School Leaving Rate

The share of "early school leavers" which are young people aged 18-24 leaving early from education and training has steadily decreased both in the EU27 and Malta. In the EU27, over the last 10 years, it declined from 12.6% in 2012 to 9.6% in 2022, a 3 percentage points

decline. In Malta, the decline in the early school leavers rate is more rapid, in fact it declined from 18.1% in 2012 to 10.1% in 2022, an 8 percentage points decline. Hence, in 2022, Malta's early school leaving rate converged to the EU average (Figure 2.2.1)

In addition, data show that more young men left education and training early than women in 2012 and the same pattern held in 2022. In fact, for the EU27, in 2012, 14.5% were Males and 10.6% were Females. During the same year, for Malta, 22.6% were Males and 13.4% were females. In 2022, as already explained the early school leavers decreased, however the males rate remained exceeding the female rate for both the EU27 and Malta (See Figure 2.2.2).

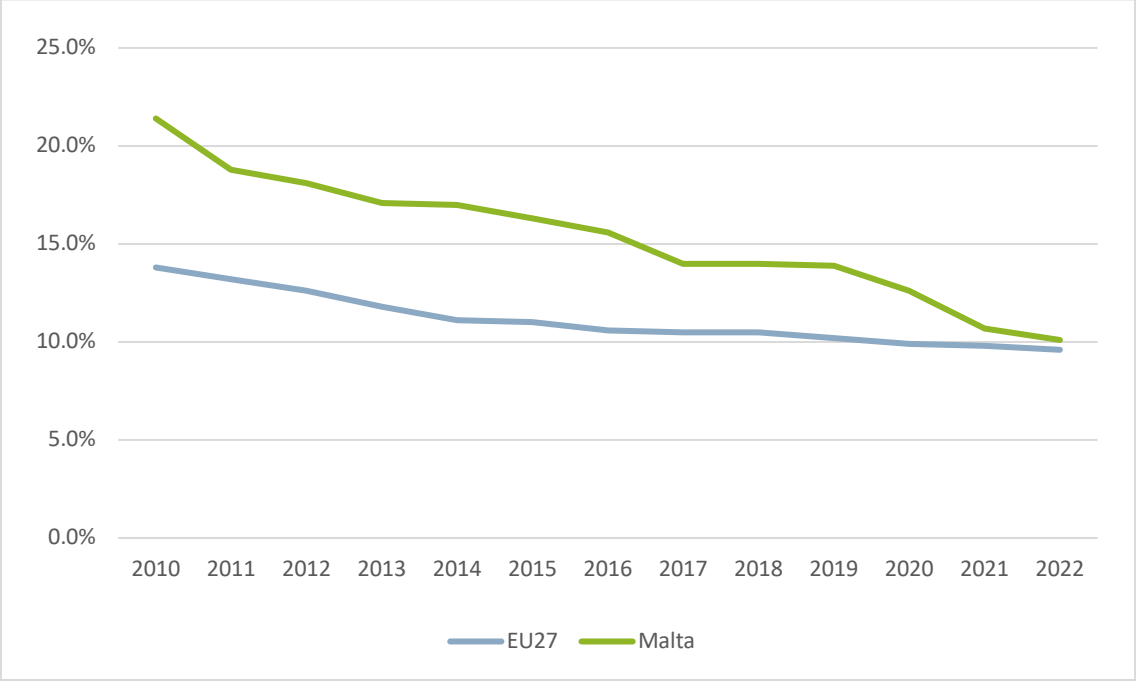

FIGURE 2.2.1 EARLY LEAVERS FROM EDUCATION AND TRAINING *(SOURCE: EUROSTAT, 2023)*

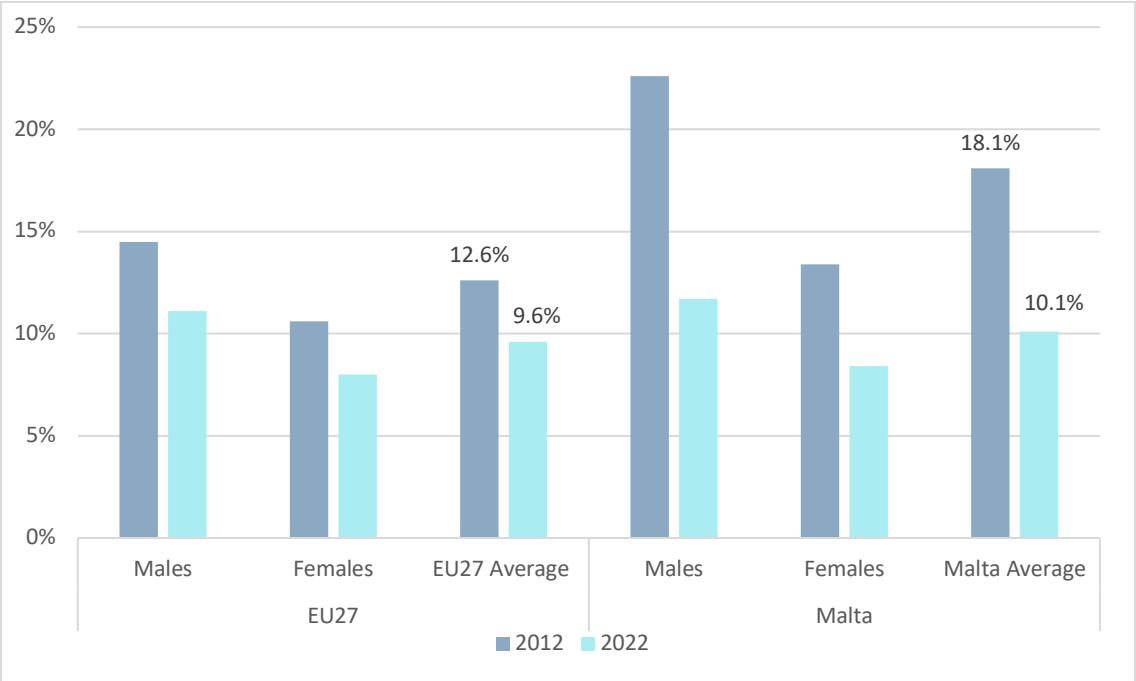

FIGURE 2.2.2 EARLY LEAVERS FROM EDUCATION AND TRAINING BY GENDER (*SOURCE: EUROSTAT, 2023)*

2.3 World Bank Human Capital index

The Human Capital Index (HCI) database provides data at the country level. The HCI measures the knowledge, skills, and health that individuals can accumulate over their lifetimes and, therefore, represents the potential productivity of the current generation of workers. The HCI is typically expressed as a score ranging from 0 to 1, with higher scores indicating higher human capital development.

In 2020, Finland held the highest score at 0.8, which indicates that the country's population, on average, has access to good-quality education and healthcare, and individuals are well-prepared to contribute to the country's economic and social development. Moreover, a high HCI score, is often associated with the potential for higher economic growth and improved living standards. The lowest score of Romania (0.58), indicates a lower level of human capital development. It suggests that there may be room for improvement and that the population may face challenges related to access to quality education and healthcare, which can impact their potential for productivity and well-being. In addition, a low HCI score may indicate

limited capacity to contribute to the economy effectively. The HCI score for Malta is 0.71, slightly below the EU27 average of 0.73, which indicates a moderate to high level of human capital development. A score of 0.71 suggests that the population has relatively good access to education and healthcare, and individuals are likely to be well-prepared for productive work and participation in society. Hence, Malta comparative to its EU country has a potential for refinement and growth (see Figure 2.3.1).

For 2020, the HCI is disaggregated by gender, for each of the HCI components (see Table 2.3.1). It shows that the HCI for girls is higher than for boys, as boys have an average HCI of 0.68 while girls have an average of 0.74. The specific components of the HCI are the survival to age 5, expected years of school, harmonised test scores, learning-adjusted years of school, adult survival rate and the not stunted rate. The results indicate that 99 out of 100 children born in Malta survive to age 5, a child who started school at age 4 can expect to complete 13.4 years of school by their 18th birthday. Furthermore, from a score ranging between 635 (advanced attainment) and 300 (minimum attainment), students in Malta score 474, indicating that there are some room for improvement. The learning-adjusted years of school component factors in what children actually learn the average for Malta is quite low as the expected years of school is 10.2 years. Additionally, on average 95% of 15-year-olds will survive until the age of 60, this statistic is a proxy for the range of health risks that a child born today would experience as an adult under the current conditions. Lastly, comparability data on stunting is not available for Malta.

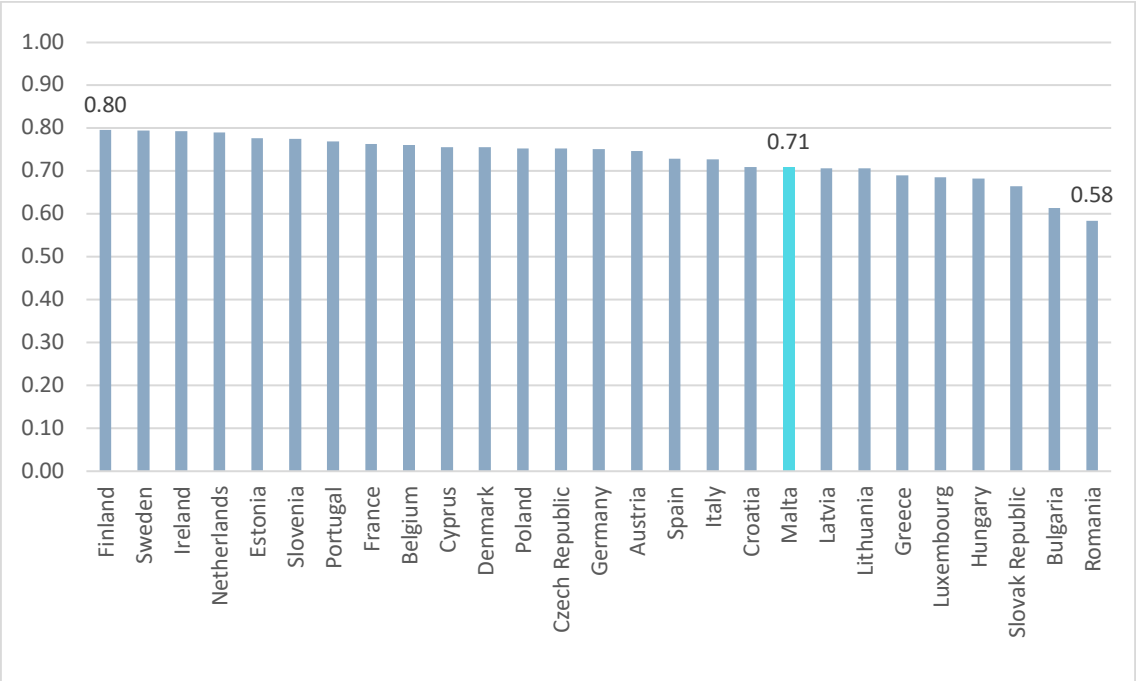

FIGURE 2.3.1 HUMAN CAPITAL INDEX – 2020 *(SOURCE: WORLD BANK, 2020)*

TABLE 2.3.1 HCI AND ITS COMPONENTS – 2020 *(SOURCE: WORLD BANK, 2020)*

HCI and its components (for Malta)	Malta			EU27
	Boys	Girls	Overall	Overall
HCI	0.68	0.74	**0.71**	**0.73**
Survival to Age 5	1.0	1.0	**1.0**	**1.0**
Expected Years of School	13.4	13.5	**13.4**	**13.4**
Harmonized Test Scores	461.0	489.0	**474.0**	**503**
Learning-adjusted Years of school	9.8	10.6	**10.2**	**10.7**
Adult Survival Rate	0.9	1.0	**1.0**	**0.92**
Not Stunted Rate	-	-	**-**	**-**

2.4 Employment rates by International Standard Classification of Education (ISCED)

Malta boasts one of the most impressive employment rates for recent graduates (90.8%) at levels 3 to 8, surpassing the EU27 average of 82.4% (see Figure 2.4.1). This shows that a significant majority of individuals who have recently completed their education and stepped into the job market have indeed secured employment. Several factors contribute to this elevated employment rate, including a thriving job market with substantial demand for skilled professionals and the overall economic situation. A stable and expanding economy typically results in higher employment rates. Furthermore, the thriving industries in Malta, such as the iGaming sector, are continually expanding and require additional workforce to meet their needs.

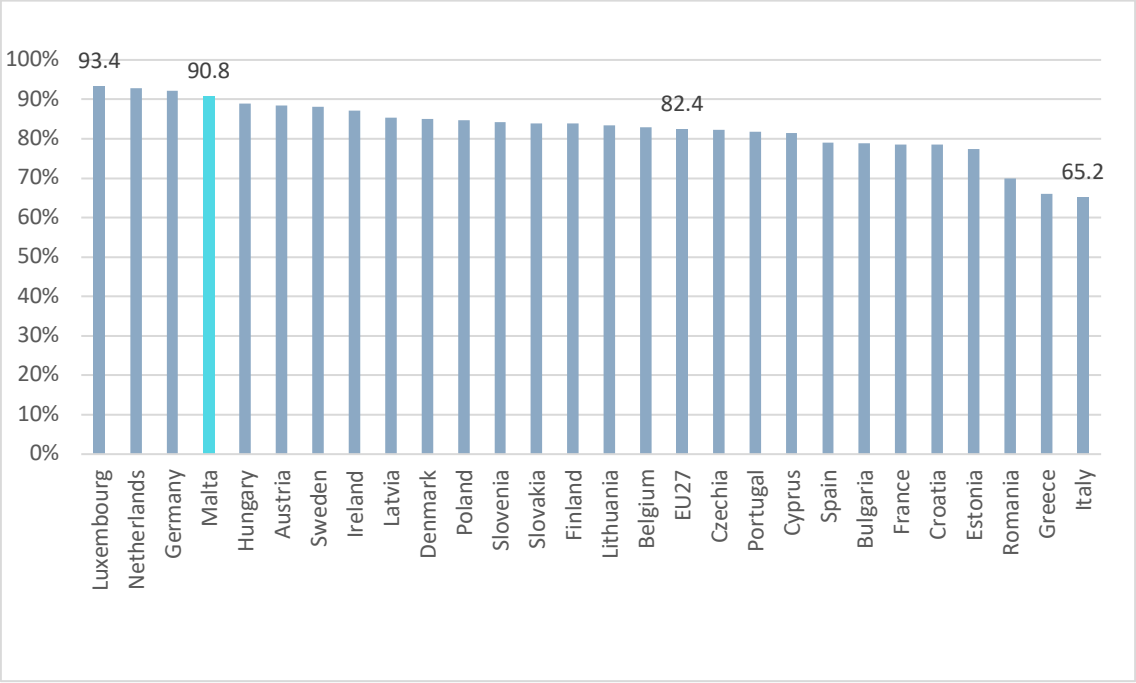

FIGURE 2.4.1 EMPLOYMENT RATES OF RECENT GRADUATES (LEVEL 3-8), 2022 *(SOURCE: EUROSTAT,2023)*

2.5 European Skills Index

The European Skills Index (ESI) measure the performance of EU skills systems. The ESI measures the country's distance from ideal performance[7]. The ideal performance is scaled to be 100 and the score of all countries are computed and compared. The ESI consists of three pillars: skills development, activation, and matching. The scores are then averaged at the various layers and finally the index score is formed. The country with the highest score is Czechia with a score of 70, which suggests that this country has reached 70% of the ideal performance. Thus, there is still 30% room for improvement. Malta overall ESI score is of 58, which suggests that Malta has reached 58% of the ideal performance. (See Figure 2.5.1).

Looking at each pillar separately, starting off with the skills development, Malta scored 35.7, which is one of the lowest scores recorded. This means that when it comes to skills development Malta only achieved 36% of the ideal performance. Skills development represents the training and education activities of the country and the immediate outputs of the educational systems in terms of the skills development and attainment. Thus, it indicates that Malta has low quality, participation, and achievement in compulsory and vocational education and training (VET). Malta scored very poorly in VET students (18%) and reading, maths and science scores (22%). However, despite this poor score in this pillar, Malta scored fair-to-middling when it comes to pupil-to-teacher ratio (64%) and high digital skills (55%).

The second pillar which composes the ESI is the skills activation, Malta scored 67, which is one of top scores attained. This indicates that for this pillar Malta attained 67% of the ideal performance, there is still 33% room for improvement. Skills activation includes indicators of the transition from education to work, together with labour market activity rates. This helps to identify those of which have a greater or lesser representation in the labour market. One of the sub-pillars is the transition to work which consists of two indicators, one measure the transition from education to employment, Malta scored 62 and the other indicator is early leavers from education & training and recent graduates in employment. Malta scored 43 and an impressive score of 91, which shows that it achieved a lot of its potential when it comes to

[7] This ideal performance is chosen as the highest achieved by any country over a period of 7 years.

recent graduates' employability. Another sub-pillar is the labour market participation which consists of two indicators to measure activity rates of different groups of the population. The first indicator is the activity rate of core working population (25-54 years) and the youth activity rate (20-24 years), Malta scored 55 and 88, respectively.

The final pillar which composes the ESI is the skills matching, Malta scored 75, which is the second top score when compared to the other EU countries. This indicates that for this pillar Malta attained 75% of the ideal performance. Skills matching measure the degree of successful utilisation of skills, its sub-pillars are skills under-utilisation and skills mismatch. The skills utilisation comprises of 2 indicators, measuring different aspects of skills utilisation: long-term unemployment and the underemployment of part-time workers (which are those who work part-time because they cannot find suitable full-time job). For this indicators Malta scored as follows: long-term unemployment (87%) and the underemployment of part-time workers (91%) which indicates a low rate of both long-term unemployment and underemployment of part-time workers, as 100% is the ideal performance with all individuals in an economy in employment. The other indicator is the skills mismatch sub-pillar comprises of 3 indicators measuring different aspects of surpluses and underutilisation of skills in the labour market. These indicators are the overqualification rate (those with higher education that have a job that does not require it); low-waged workers (tertiary graduates that are low-waged earners) and the qualification mismatch (the extent to which each employee's education attainment level matches the modal education attainment level for each occupation in each industry)[8]. For these indicators Malta scored 60 and 88, respectively.

[8] The qualification mismatch score was not calculated for Malta.

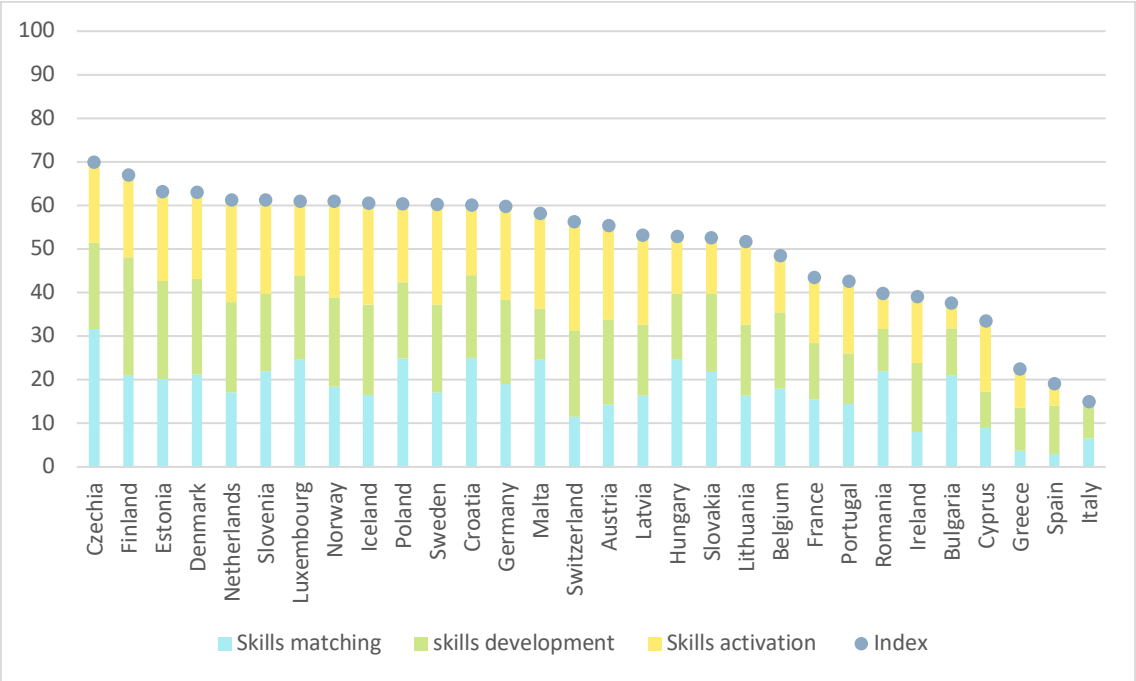

FIGURE 2.5.1 EUROPEAN SKILLS INDEX – 2022 *(SOURCE: CEDEFOP,2023)*

2.6 Skills by Economic Sector

The EUKLEMS – INTANProd database provides detailed data for 27 EU Member States, the US, Japan, and the United Kingdom, across 40 industries (although coverage may vary over time and across countries), 23 industry aggregates, over the period 1995-2020. This section focuses particular on the labour accounts.

The labour accounts include the shares of employment and labour compensation by type of worker cross-classified by gender, age, and educational attainment by industry. It particularly focuses on assessing Malta's share of employment skills by type of economic sector overtime. In this case, education is used as a signal of skills, which often serves as a way for individuals to communicate and demonstrate their skills and abilities to potential employers or others.

Figure 2.6.1 depicts the education-weighted composite scores of various industries within the Maltese economy, comparing the years 2010 and 2020. Skills are categorised into three levels: highly skilled (1), moderately skilled (2), and low skilled (3). The data reveals an overall improvement in the skill levels across all sectors, except the Electricity, gas, steam and air

conditioning supply industry during the period under consideration, as indicated by the upward trends. Furthermore, the analysis highlights that the industries with the highest skill levels in Malta are education and professional, scientific, and technical activities.

Additionally, when considering absolute change in the skill level improvements, the real estate sector, public administration, and defence (including compulsory social security), and the arts, entertainment, and recreation sector experienced the most significant increases (see Figure 2.6.2)

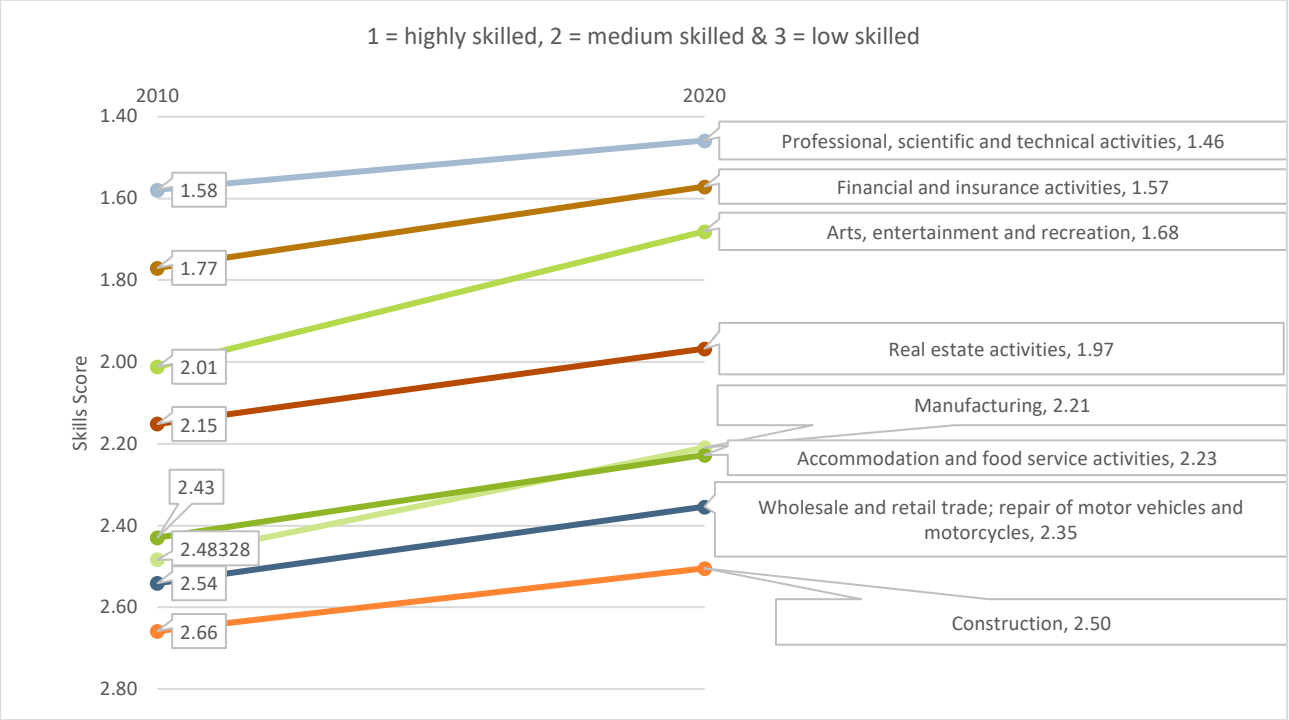

FIGURE 2.6.1 SHARE OF EMPLOYMENT SKILLS, BY TYPE OF ECONOMIC SECTOR OVERTIME *(SOURCE: AUTHOR'S CALCULATIONS & EUKLEMS & INTANPROD DATABASE, 2023)*

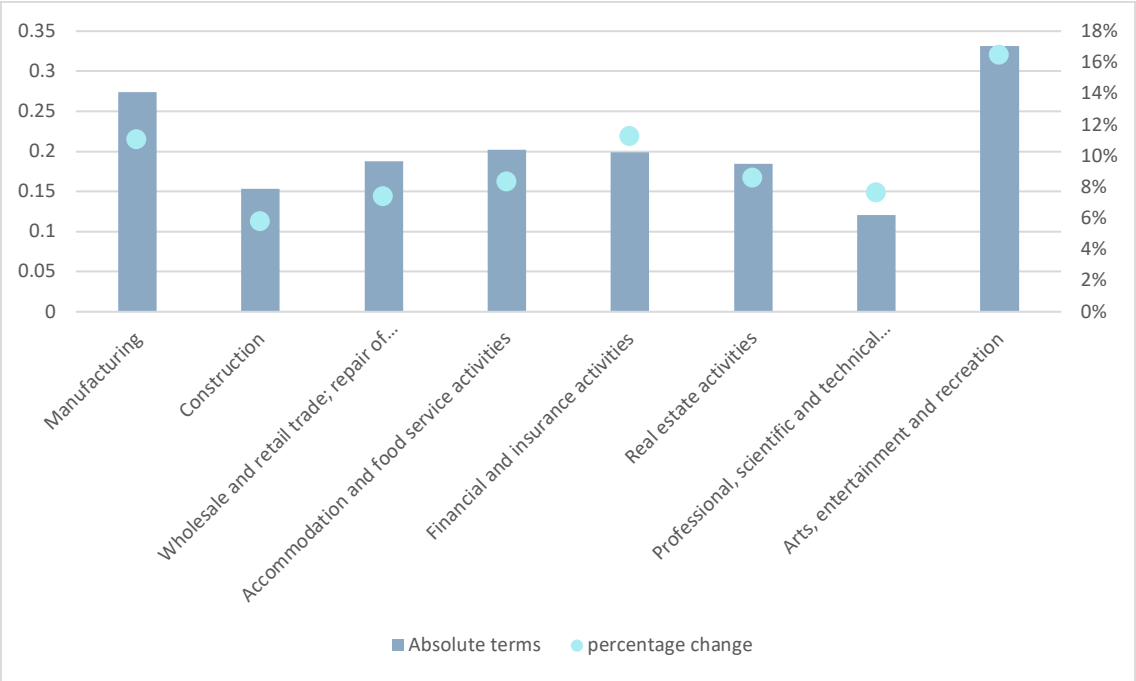

FIGURE 2.6.2 ABSOLUTE AND PERCENTAGE CHANGE IN IN SKILLS, BY INDUSTRY (*(SOURCE: AUTHOR'S CALCULATIONS & EUKLEMS & INTANPROD DATABASE, 2023)*

TABLE 2.6.1 CHANGE IN SKILLS, ALL ECONOMIC SECTOR (*SOURCE: AUTHOR'S CALCULATIONS & EUKLEMS & INTANPROD DATABASE, 2023)*

	Code	2010	2020	Absolute terms	percentage change
Agriculture, forestry and fishing	**A**	2.48	2.42	0.06	3%
Mining and quarrying	**B**	2.14	1.90	0.25	12%
Manufacturing	**C**	2.48	2.21	0.27	11%
Electricity, gas, steam and air conditioning supply	**D**	2.09	2.21	-0.12	-6%
Water supply; sewerage, waste management and remediation activities	**E**	2.48	2.18	0.31	12%
Construction	**F**	2.66	2.50	0.15	6%
Wholesale and retail trade; repair of motor vehicles and motorcycles	**G**	2.54	2.35	0.19	7%
Transportation and storage	**H**	2.39	2.31	0.08	3%
Accommodation and food service activities	**I**	2.43	2.23	0.20	8%
Financial and insurance activities	**K**	1.77	1.57	0.20	11%
Real estate activities	**L**	2.15	1.97	0.18	9%
Professional, scientific and technical activities	**M**	1.58	1.46	0.12	8%

Administrative and support service activities	**N**	2.37	2.19	0.18	8%
Public administration and defence; compulsory social security	**O**	2.20	1.93	0.27	12%
Education	**P**	1.54	1.47	0.07	5%
Human health and social work activities	**Q**	2.07	1.75	0.31	15%
Arts, entertainment and recreation	**R**	2.01	1.68	0.33	16%
Other service activities	**S**	2.21	2.03	0.17	8%
Total - all NACE activities	**TOT**	2.28	1.97	0.31	14%
Total industries (A-S)	**TOT_IND**	2.28	1.97	0.30	13%

2.7 Malta Skills Survey

The Malta skills survey was launched on 5 October 2022 and a nationwide study was held between October and December 2022. The study's aim was to collect a national stock-take of Malta's skills and qualifications among the working age population and shed light on the skills profile of Malta's workforce.

The results attained from Malta's skills survey were analysed together with the Labour Force Survey (LFS) for 2021, and two main dimensions of qualification mismatch were analysed, vertical and horizontal mismatch.

2.7.1 Vertical mismatch

The LFS indicated that more than half of the employed population in Malta (54.3%) experienced a vertical mismatch[9]. The majority of these workers were over-educated for their job (35.1%), while a further 19.3% were underqualified for their respective roles (see Figure 2.7.1)

[9] Vertical mismatch, also known as level of education mismatch, occurs when the level of education of the person in employment does not correspond to the level of education required to perform one's job (International Labour Office, 2018).

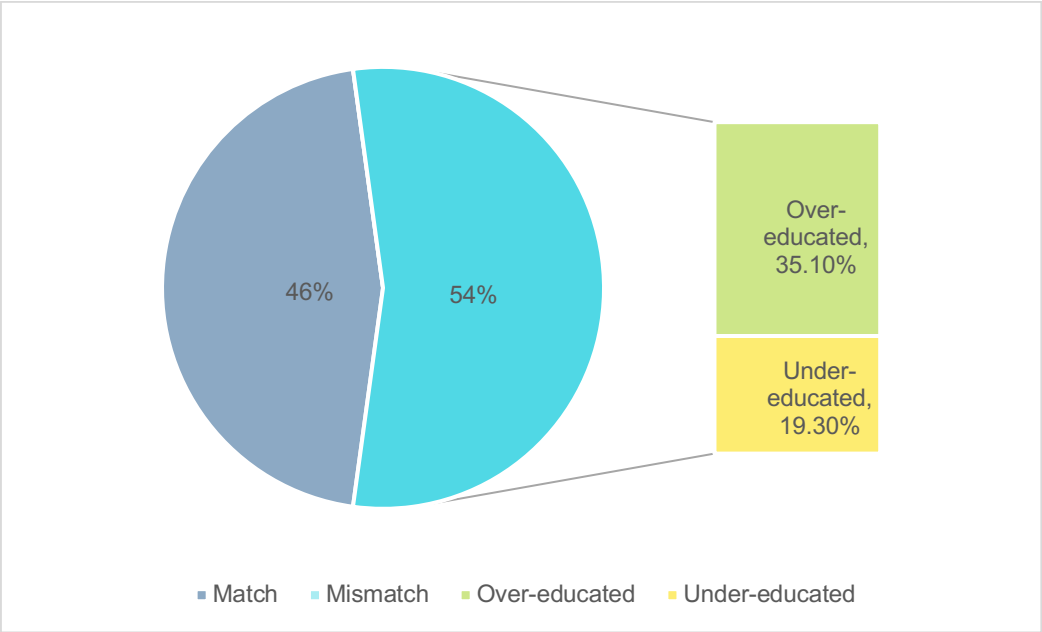

FIGURE 2.7.1 VERTICAL MISMATCH IN MALTA *(SOURCE: NSO,2023)*

Furthermore, the study shows that females (39.9%) were more overqualified when compared to males (31.7%) and the occupation group which recorded the largest share of overqualified workers were in technicians and associated professionals' occupations (39%), followed by clerical support workers (26.2%), Conversely, managers (54.4%) and professionals (27.8%) were more likely to be under-educated for their job. Subsequently, the economic activity which recorded the highest share of persons who were over-educated were employed in public administration, defence, education, human health, and social work activities (41.4%) followed by the other services sector (37.7%).

2.7.2 Over-qualification rate

The overqualification rate in Malta seems to be gradually growing, in fact from 12.4% in 2012, it increased to 20.2% in 2021 (see Figure 2.7.2). The increasing overqualification rate may have several implications for the labour market and the economy. This could indicate potential challenges in aligning education and skills development. Furthermore, overqualified workers may face job dissatisfaction or underutilisation of their skills, potentially affecting overall productivity.

In the midst of labour market tightness in Malta, one would anticipate a more precise match between the skills sought by employers and those available in the workforce. Contrary to this expectation, there is an observable trend of a gradual increase in the overqualification rate in Malta. This suggests a potential misalignment between the skills possessed by workers and the opportunities presented in the job market.

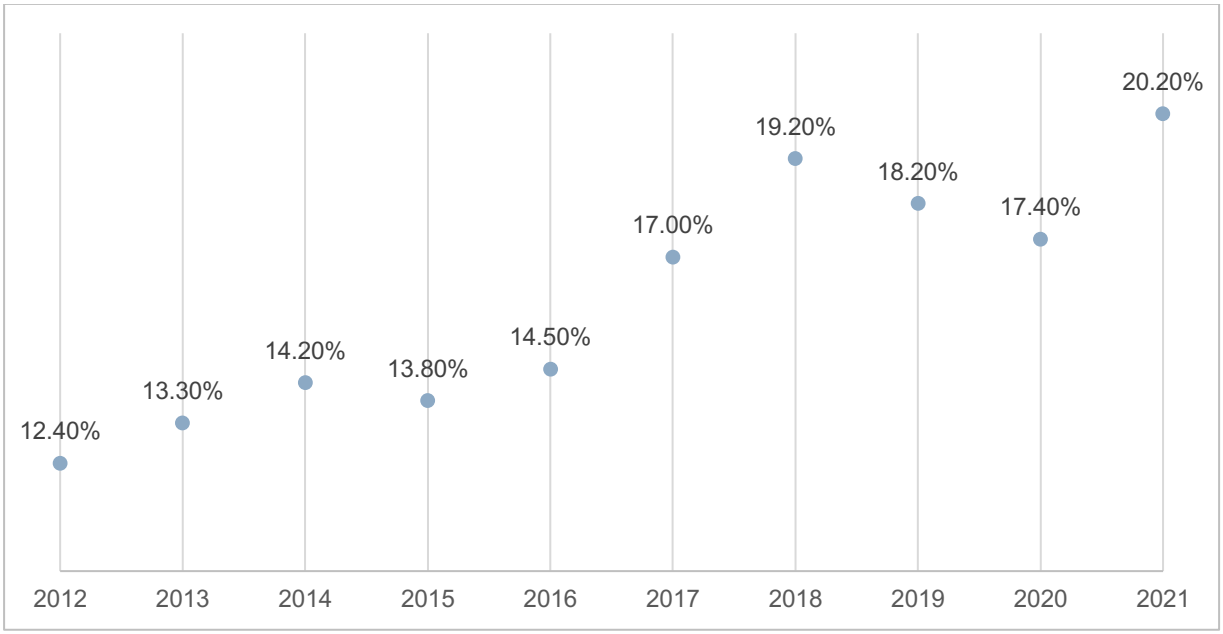

FIGURE 2.7.2 OVER-QUALIFICATION RATE IN MALTA OVERTIME *(SOURCE: NSO,2023)*

2.7.3 Horizontal mismatch

The LFS showed that in 2021, 52.4% of the employed population with an ISCED 4 qualification or higher in Malta were working in the same educational field. While the remaining 47.6% were employed in a different field to what they studied resulting in horizontal mismatch.[10]

Furthermore, discrepancies were evident by level of education. Field of education mismatch was prevalent among person with a tertiary level of education (48.1%). This suggests an underutilisation of skills and potential inefficiencies in the labour market, Subsequently, workforce that is not fully utilising its education and skills may contribute less to economic

[10] Horizontal mismatch, also known as field of education mismatch, occurs when there is a discrepancy between a person's current occupation and their field of education based on the highest level of education that they attained (International Labour Office, 2018; Kriechel & Vetter, 2019).

growth. This underperformance can impact the overall productivity and competitiveness of a country.

In 2021, 63.5% and 51.2% employed in other services sector and wholesale and retail trade, transportation and storage, accommodation, and food service activities respectively, were employed outside the field of their academic study. Conversely, a majority of those working in construction (66.9%) and financial and insurance activities (61.7%) were employed in the same field as their academic study (see Figure 2.7.3)

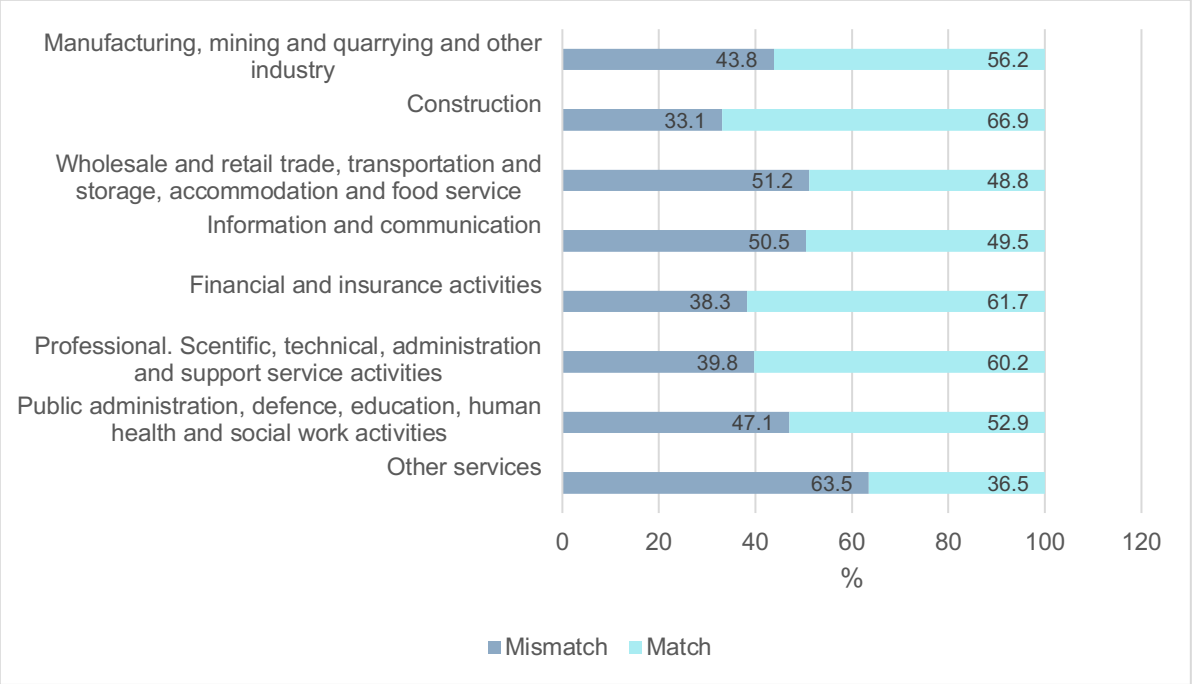

FIGURE 2.7.3 HORIZONTAL MISMATCH BY ECONOMIC ACTIVITY IN MAIN JOB *(SOURCE: NSO,2023)*

2.7.4 Overall qualification mismatch

In general, a substantial majority of individuals possessing a post-secondary education (ISCED 4) or higher experienced either one (education or field mismatch) or both types of qualification mismatch, totalling 83.7%. Consequently, only 16.3% indicated a complete alignment (full match).

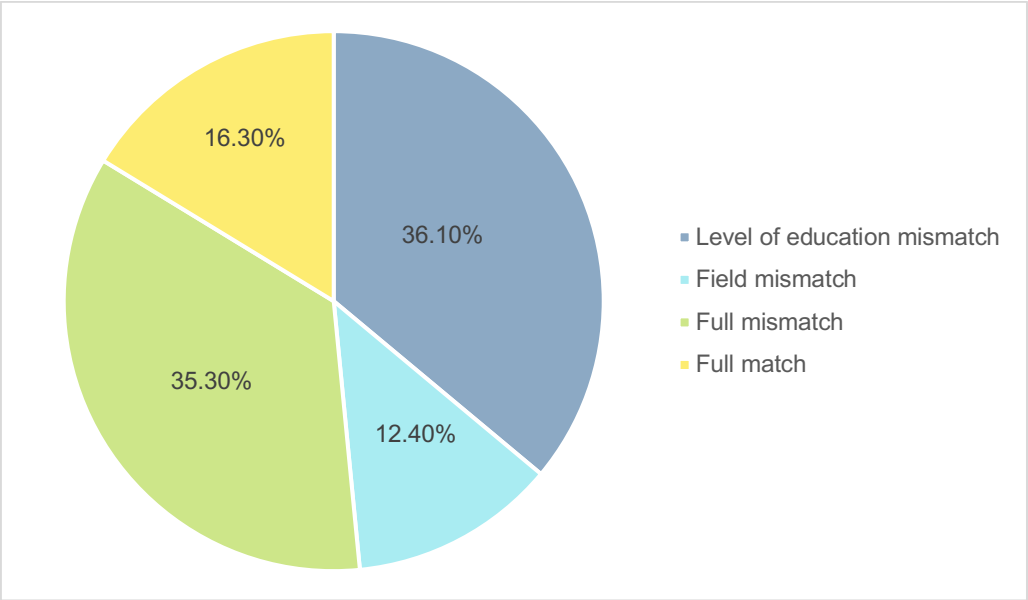

FIGURE 2.7.4 QUALIFICATION MISMATCH BY TYPE OF MISMATCH *(SOURCE: NSO,2023)*

CHAPTER 3: RESEARCH, INNOVATION AND DIGITALISATION

3.1 European innovation scoreboard

The European Commission issues the country profile of the European innovation scoreboard (EIS) for Malta. In 2023 Malta registered the lowest score as Malta's innovation performance stood at 85.8%, which is below the average of the EU moderate innovator (86.1%). Figure 3.1.1 shows the heading of the category contributing to the EIS; however, these categories consist of multiple sub-categories[11]. For example, the digitalisation category consists of two sub-categories: broadband penetration and people with above basic overall digital skills.

Malta's country profile highlights that Malta experienced a relative strength to the other EU countries with respect to foreign doctorate students, trademark application, employment in knowledge-intensive activities, people with above basic overall digital skills and design applications. On the other hand, Malta experienced a relative weakness with respect to Government support for business R&D, venture capital expenditures, R&D expenditure in the public and business sector and doctorate graduates.

It also points out certain structural differences with the EU such as Malta boasts a higher per capita income and a rapidly growing economy. Business services constitute a larger portion of the economy, while small and medium-sized enterprises (SMEs) contribute significantly to overall turnover. In terms of the innovation landscape, enterprise births and net foreign direct investment (FDI) inflows have a positive impact, while high expenditures on research and development (R&D) and buyer sophistication have a somewhat adverse influence. Malta also exhibits higher proportions of in-house business process innovators, non-innovators with potential to innovate, as well as non-innovators without a disposition for innovation. Interestingly, government procurement as a catalyst for research and innovation surpasses the EU average. However, Malta's performance in climate change indicators is mixed, with recycling achievements falling below the European average. Therefore, to enhance Malta's

[11] Full list of the sub-categories attached in Annex: Table 5.2.1.

innovation performance, it is imperative to exert more significant efforts towards transforming Malta's existing weaknesses into strengths.

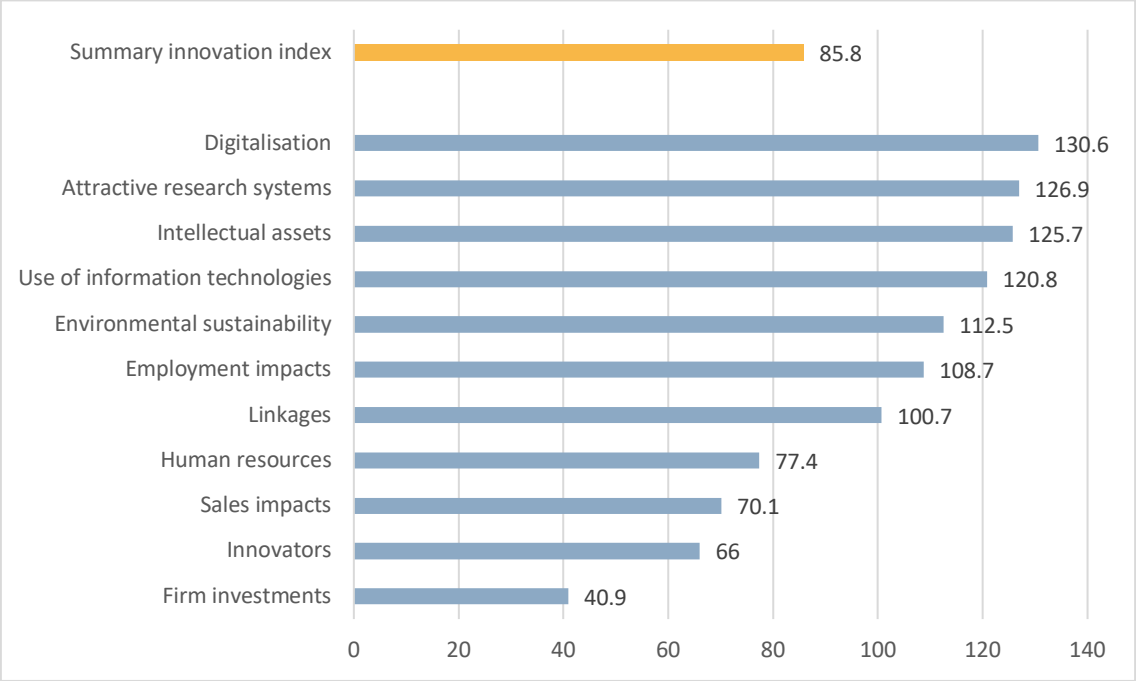

FIGURE 3.1.1, PERFORMANCE RELATIVE TO EU IN 2023 *(SOURCE: EUROPEAN INNOVATION SCOREBOARD, 2023)*

3.2 Research & Development expenditure

Firstly, Malta's Gross Domestic Expenditure on Research and Development (GERD) is analysed overtime. GERD captures total annual spending on R&D within the Maltese economy across all sectors. The GERD per inhabitant, is a measure of total expenditure on research and development activities within a country, divided by the population of that country. This metric is used to assess how much a country invests in research and development relative to its population size.

GERD per inhabitant, is shown in Figure 3.2.1. This figure notably emphasises that Malta's GERD per capita falls significantly below the average figures for both the EU and the Euro Area (EA). Specifically, in the year 2021, Malta's GERD per capita amounted to €184.70. In contrast, the corresponding averages for the EU and EA were €734 and €825.50, respectively. This

shows that Malta spends much less on research and development per person compared to the average spending levels within the EU and the EA. Malta's GERD per capita is notably lower, indicating that there is a significant gap between Malta and the rest of the EU. Nonetheless, it is important to note that in 2021 Malta's GERD per inhabitant increased by 66% relative to 2011.

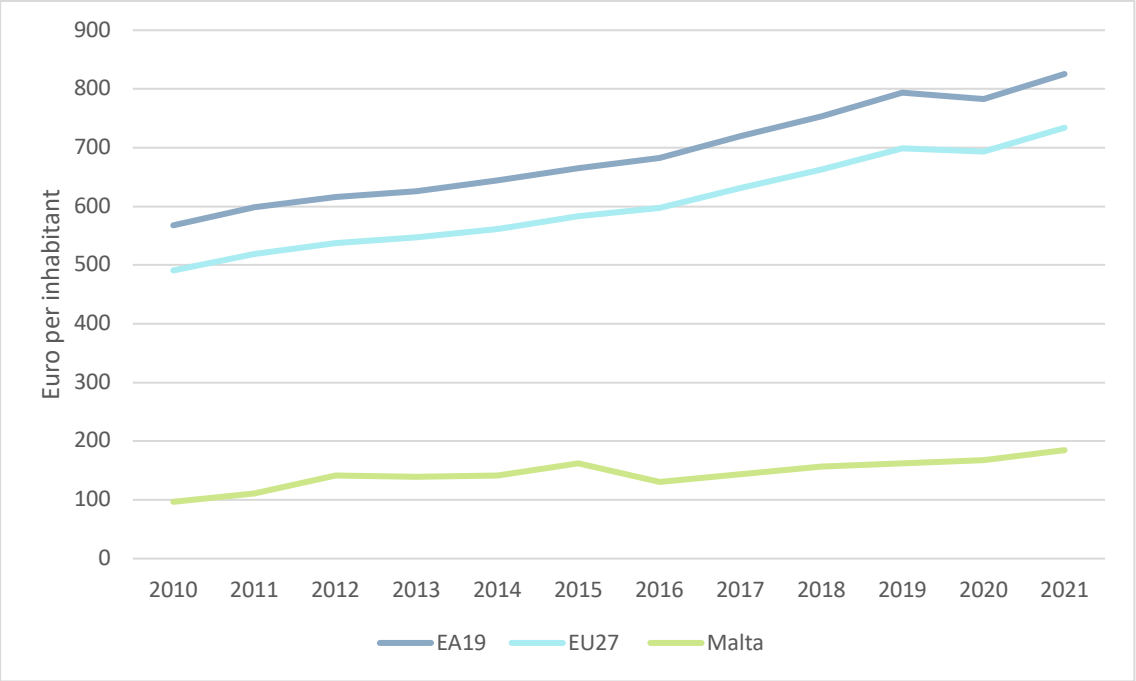

FIGURE 3.2.1 GERD PER INHABITANT, 2010-2021 *(SOURCE: EUROSTAT, 2023)*

Specifically, assessing the GERD by sector between 2010-2021, it shows that the business enterprise sector has been the main driver of R&D in Malta, which has grown by over 101%, relative to 2011, reflecting the country's significantly increased R&D efforts over this period. Higher education institutions in Malta have also contributed heavily to this growth in R&D spending, in fact, it registered a 139% increase between 2011 and 2021. The only sector which is lacking improvement is the Government sector, which shrunk by 45%, however, this percentage may be misleading given that the higher education sector is largely dominated by publicly run institutions like the University of Malta, which is actively engaged in R&D (see Figure 3.2.2). Furthermore, as shown in Figure 3.2.3 although the primary source of R&D funding in Malta is still the business enterprise sector (60.2%), the government is responsible for around 30.3% of the funds, followed by external funds (8.2%) from the rest of the world.

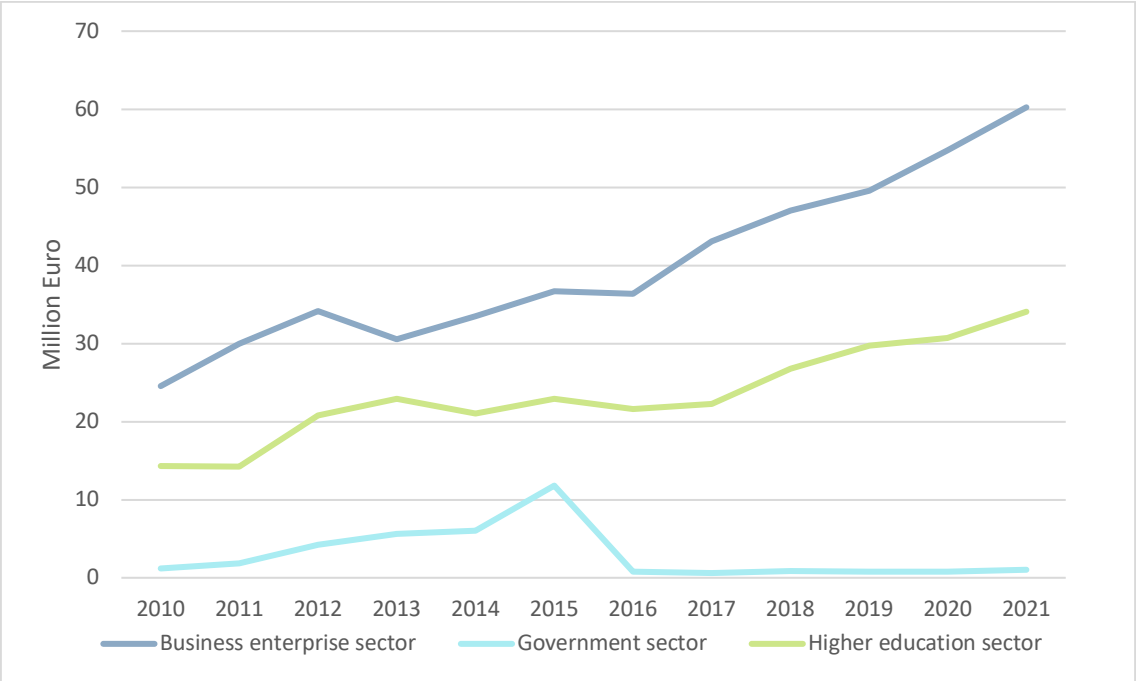

FIGURE 3.2.2 GERD BY SECTOR IN MALTA, 2010-2021 *(SOURCE: EUROSTAT, 2023)*

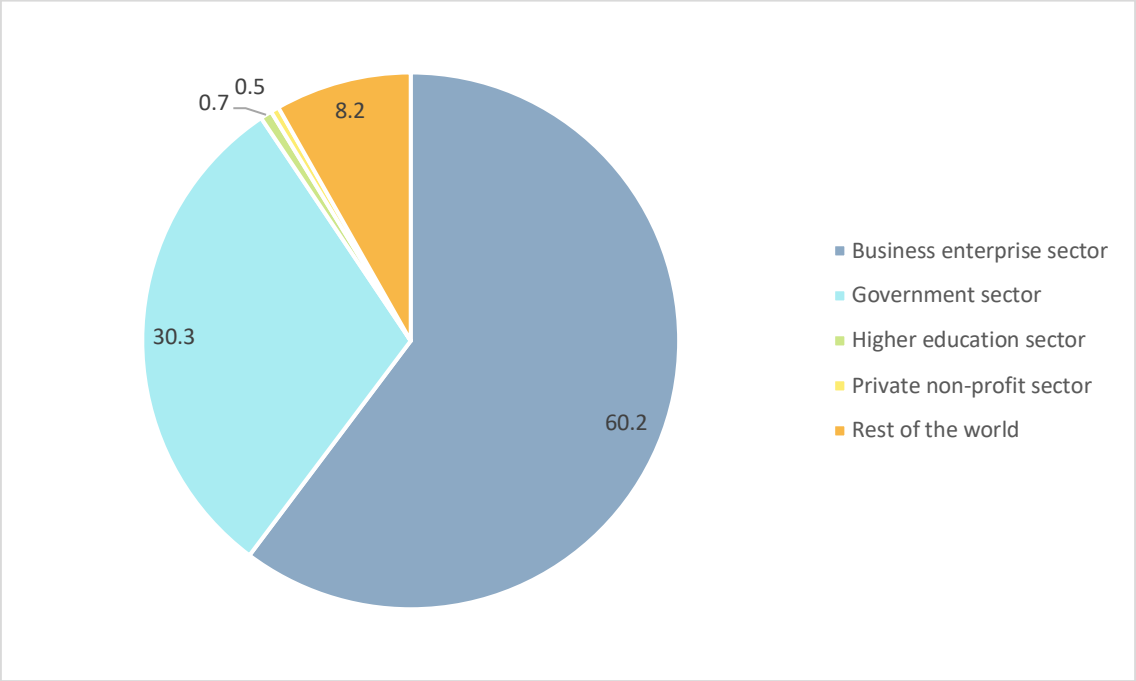

FIGURE 3.2.3 GERD BY SOURCE OF FUNDS IN MALTA, 2020 (*SOURCE: EUROSTAT,2022)*

3.3 Digital Economy and Society Index

The digital economy and society index (DESI) is published by the European Commission (EC) to monitor Member States progress on digital. The DESI overall index is calculated as the weighted average of the four main dimensions. These four dimensions which construct the DESI index are the human capital, connectivity, integration of digital technology and the digital public services. Each of these dimensions consists then of multiple sub-dimensions. The DESI index ranges from 0 to 1, 0 being very low digital development and 1 being very high digital development.

In 2022, the country with the highest digital development is Finland (FI), with an overall DESI index of 0.7 and the country with lowest digital development is Romania (RO), with an overall DESI index of 0.3. Malta (MT) has an overall DESI index of 0.6, thus it can be considered as moderate digital development (see Figure 3.3.1). When compared cross-countries Malta ranked in the top ten countries. If we examine the time-series data for the DESI in Malta, we can observe a gradual evolution. In fact, the index showed a 46% improvement when comparing 2017 to 2022 (see Figure 3.3.2).

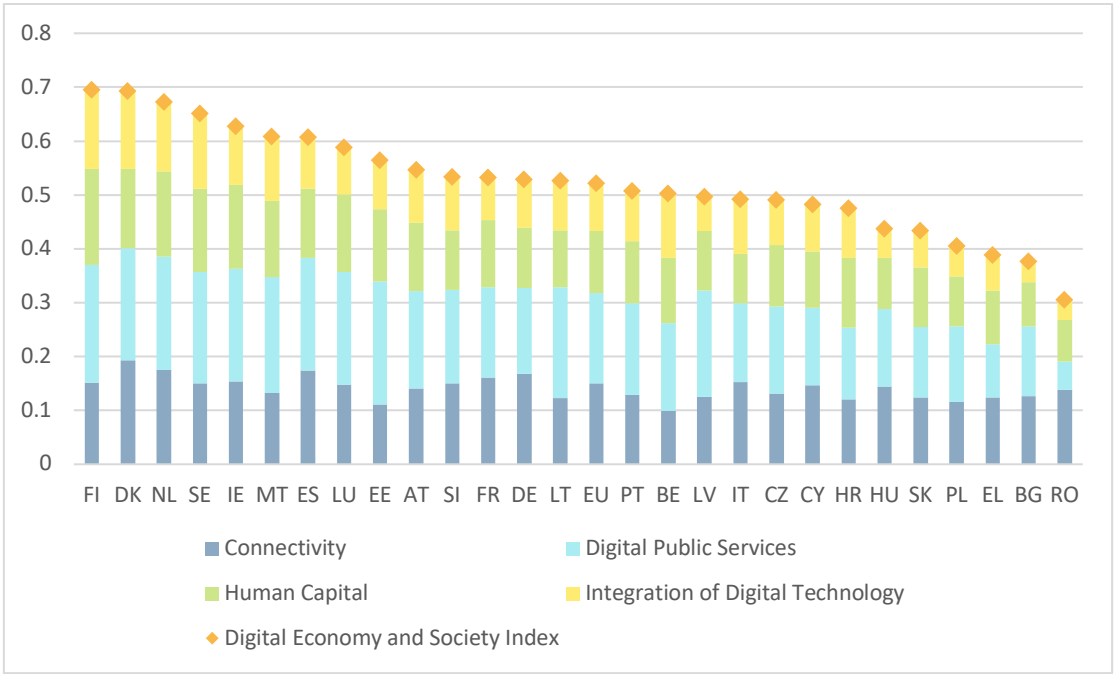

FIGURE 3.3.1 DESI INDEX, 2022 *(SOURCE: EUROPEAN COMMISSION,2023)*

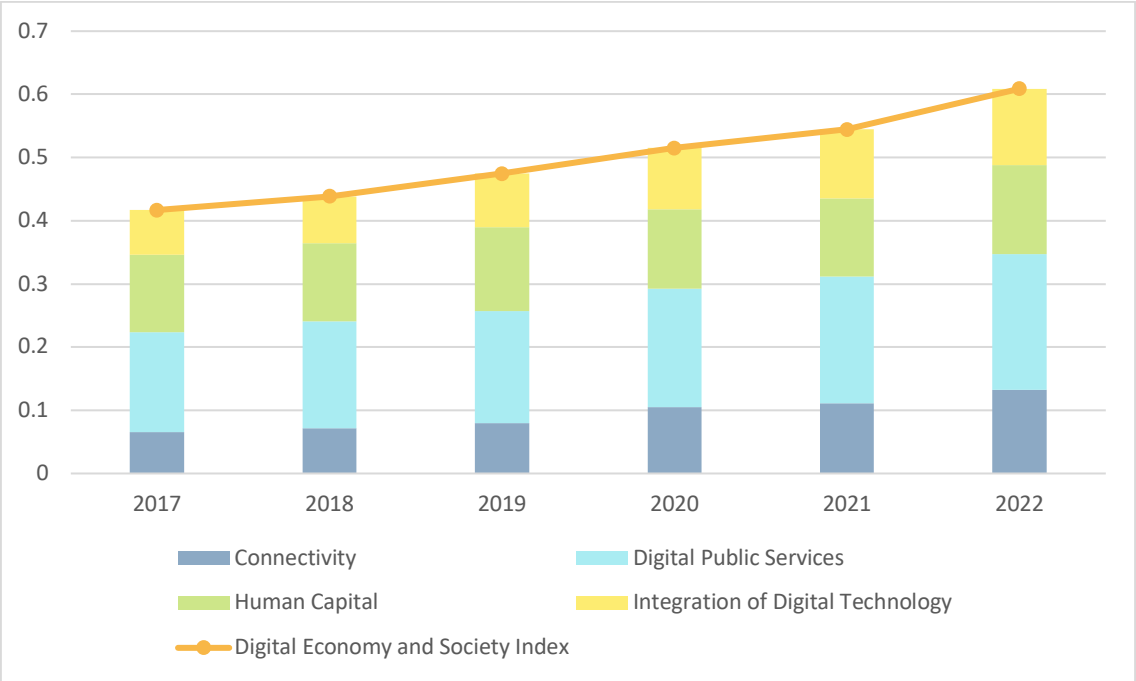

FIGURE 3.3.2 TIME-SERIES ANALYSIS OF DESI FOR MALTA, 2017-2022 *(SOURCE: EUROPEAN COMMISSION,2022)*

The DESI has a three-level structure (Dimension, sub-dimension and indicator), the below are the eleven indicators which were assigned double weighting within their sub-dimension. These particular indicators were highlighted to assess progress towards a large part of the Digital Decade targets at Member State level (see Table 3.3.1). Malta was one of the top performers in the Integration of digital technology and digital public services. On the other hand, in terms of the human capital and connectivity dimensions, Malta is lacking behind the EU average. Nonetheless, within the connectivity dimension, Malta scores higher than the average in 'Fixed Very High-Capacity Network (VHCN) coverage' and 'SMEs with at least a basic level of digital intensity'. The full table is presented in Annex 3.

TABLE 3.3.1 DESI DIMENSION AND RESPECTIVE INDICATORS WITH DOUBLE WEIGHTS

DESI Dimension	Indicators related to the Path to the Digital Decade proposal
Human Capital	At least basic digital skills Female ICT specialists ICT specialist
Connectivity	Gigabit for everyone (Fixed very high-capacity network coverage) 5G coverage
Integration of digital technology	SMEs with a basic level of digital intensity AI Cloud Big data
Digital public services	Digital public services for citizens Digital public services for businesses

TABLE 3.3.2 COMPARABILITY OF SPECIFIC INDICATORS *(SOURCE: EUROPEAN COMMISSION,2022)*

Dimension	Indicator	Malta score	Max	Min	Average
Human Capital	At least basic digital skills	0.4	0.6	0.3	0.4
	ICT specialists	0.1	0.1	0.0	0.1
Connectivity	Fixed Very High-Capacity Network (VHCN) coverage	1.0	1.0	0.2	0.7
	5G Coverage	0.2	1.0	0.0	0.5
	SMEs with at least a basic level of digital intensity	0.8	0.9	0.4	0.7
Integration of digital technology	Big data	0.6	0.6	0.2	0.4
	Cloud	0.8	1.0	0.4	0.7
Digital Public services	Digital public services for citizens	99.6	99.6	44.2	74.6
	Digital public services for businesses	97.2	100.0	42.3	81.7

Chapter 4: An Investigation of the Relationship between Wages and Productivity

4.1 Introduction

In recent years there has been an increased focus on the dynamics surrounding employee wages across the globe, precipitated by rising inflation in the wake of the COVID-19 pandemic, significant geopolitical issues and supply chain shortages. Policy scrutiny of such dynamics is of particular relevance given the need to strike a balance between ensuring that wages are high enough to keep up with rising inflation amidst labour shortages in key sectors, while also preventing a wage-price spiral which would further exacerbate inflationary pressures. Thus, within this context, an alignment of wages with labour productivity assumes even greater importance. An example of the increased focus on the wage-productivity nexus was the recent agreement on the increase in the national minimum wage in Malta, where issues such adequacy of the minimum wage as well as productivity were debated intensively by members of the Low Wage Commission and formed part of deliberations leading up to the final policy proposal which was adopted by government.

This chapter will analyse the extent to which wages and salaries in Malta reflect underlying productivity conditions and factors. The focus is on understanding these wage-productivity dynamics at the sectoral level, since there is significant variation across sectors when it comes to both average wages as well as productivity. This study leans on recent literature to develop a model for the determinants of sectoral wages and salaries in Malta, using a number of important correlates including labour productivity, proportion of workforce with a tertiary level of education, the proportion of foreign workers within the sector, expenditure on R&D, gross fixed capital formation and foreign direct investment. We first proceed to describe the methods and tools that shall be used to analyse this relationship, together with the key variables and data sources, followed by a presentation of the salient findings and a discussion of their implications.

4.2 Wage data and trends overtime in Malta

Wage dynamics commonly exhibit a phenomenon known as "downward stickiness," where they can rise relatively easily but tend to resist falling.

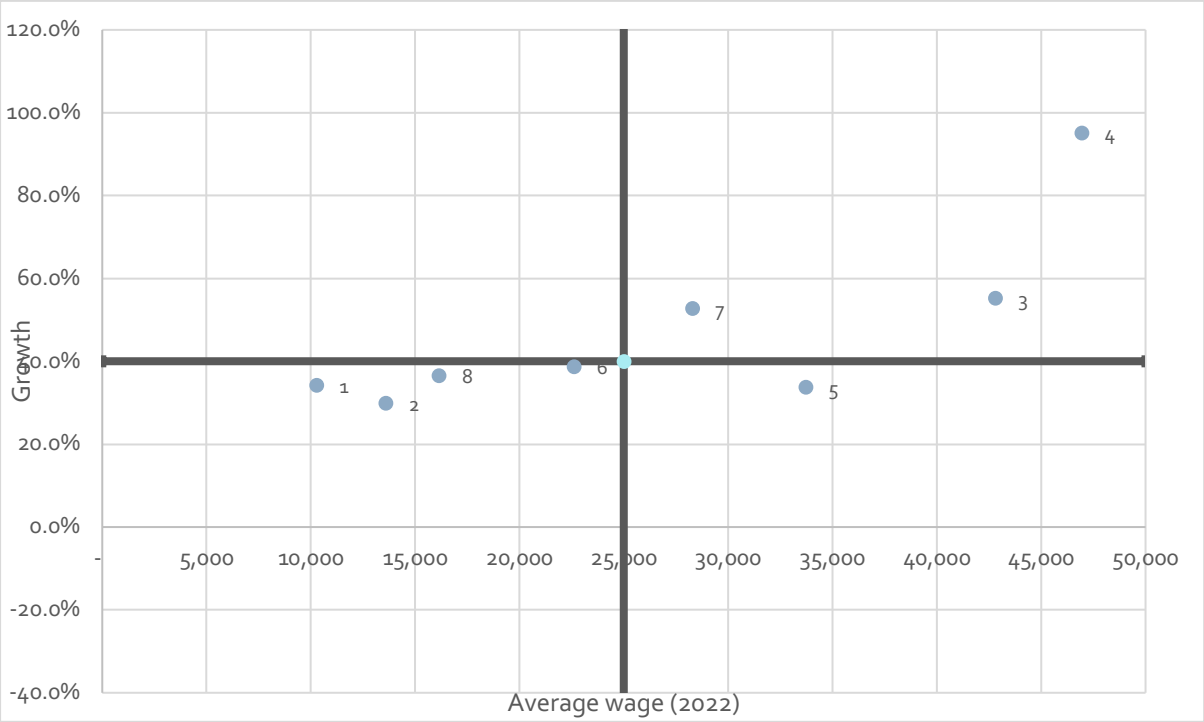

Figure 4.2.1, is based on statistics published by Eurostat and depicts the wage trend between 2012 and 2022 across various economic sectors in Malta. It reveals that most of these sectors align with the concept of 'sticky' downward wages. However, it is crucial to note that the disruptive impact of the COVID-19 pandemic has led to exceptional disturbances in certain economic sectors, exerting an influence on the actual wages within the Maltese economy.

On the onset of COVID-19, the Government of Malta announced several measures to help the Maltese economy. One of these measures was the wage supplement which aimed to provide aid to employees in the sectors most severely impacted by COVID-19. These sectors included wholesale, retail, accommodation, food and beverage service activities, vehicle rentals and leasing, employment activities, tour operators, travel agencies and other related enterprises, security and investigation services, services to buildings, transport companies, creative arts, entertainment activities and personal services. In fact, in 2020 the Accommodation and food service activities had the lowest average wage of €9,465 when compared to the other

economic sectors; this is because most of the employees relied on the wage supplement, which replaced their normal income, on average the wage supplement amounted to €800 monthly or less according to their eligibility criteria.

Over the analysed period, the economic sector with the most substantial compensation was 'Gaming'. Average wages in this sector consistently demonstrated robust wage growth, from 2012 (€24,054) to 2022 (€46,945), wages in this sector increased by an average of 95%. The financial and insurance activities sector also experienced substantial wage growth. Average wages in this sector started at €27,578 in 2012 and steadily increased over the years, reaching €42,815 in 2022. The Information and communication sector and Professional, scientific, and technical activities also showed a generally increasing trend in average wages from 2012 (€25,212 & €18,528) to 2022 (€33,711 & €28,299). The Manufacturing sector also experienced a constant growth in average wages, albeit at a slower rate, with average wages in 2012 equalling €16,305 and 2022 equalling €22,612.

On the other hand, the following economic sectors: Accommodation and food service activities, Wholesale and retail trade; repair of motor vehicles and motorcycles activities and construction experienced low wage compensations. In fact, the average wages between 2012 and 2022 were €13,733, €13,894, and €15,777 respectively. This suggests that there is a significant disparity in wage levels between these different economic sectors, with some sectors offering more competitive or higher salaries, while others provide comparatively lower compensation. However, notwithstanding the above lower average wages in the abovementioned economic sectors the trajectory of such average wages has been different for the above economic sectors. In the case of Accommodation and food service activities we see that the average wage in 2012 stood at €11,755 and in 2022 stood at €15,777. In the case of Wholesale and retail trade; repair of motor vehicles and motorcycles activities, the average wage in 2012 stood at €11,830 and the average wage in 2022 stood at €16,153. Looking at the construction sector, the average wage in 2012 stood at €10,459 and this increased to an average wage of €13,592 by 2022.

To summarise, Figure 4.2.1 plots the growth rate of wages between 2012 and 2022 on the y-axis against the average wage in 2022. The economic sectors which exhibited the greatest growth in wages and have a high absolute wage in 2022 are those in the top-right quadrant (the financial and insurance activities, gaming and professional, scientific and technical activities). Whilst the economic sector in the bottom-left quadrant experienced a lower growth rate resulting in a low absolute wage in 2022. The construction, accommodation and food services, manufacturing and wholesale and retail trade; repair of motor vehicles and motorcycles experienced a comparatively low but positive growth rates in wages. The information and communication sector was the only one which had a comparatively low wage growth rate, while having a high absolute wage. This is shown in the graph as it is located in the bottom right quadrant.

TABLE 4.2.1 AVERAGE WAGE AND GROWTH BETWEEN 2012-2022

Graph code	Economic Sector	Average wage (2022)	Growth
1	Accommodation and food service activities	15,777	34.2%
2	Construction	13,592	30.0%
3	Financial and insurance activities	42,815	55.3%
4	Gaming	46,945	95.2%
5	Information and communication	33,711	33.7%
6	Manufacturing	22,612	38.7%
7	Professional, scientific and technical activities	28,299	52.7%
8	Wholesale and retail trade; repair of motor vehicles and motorcycles	16,153	36.5%

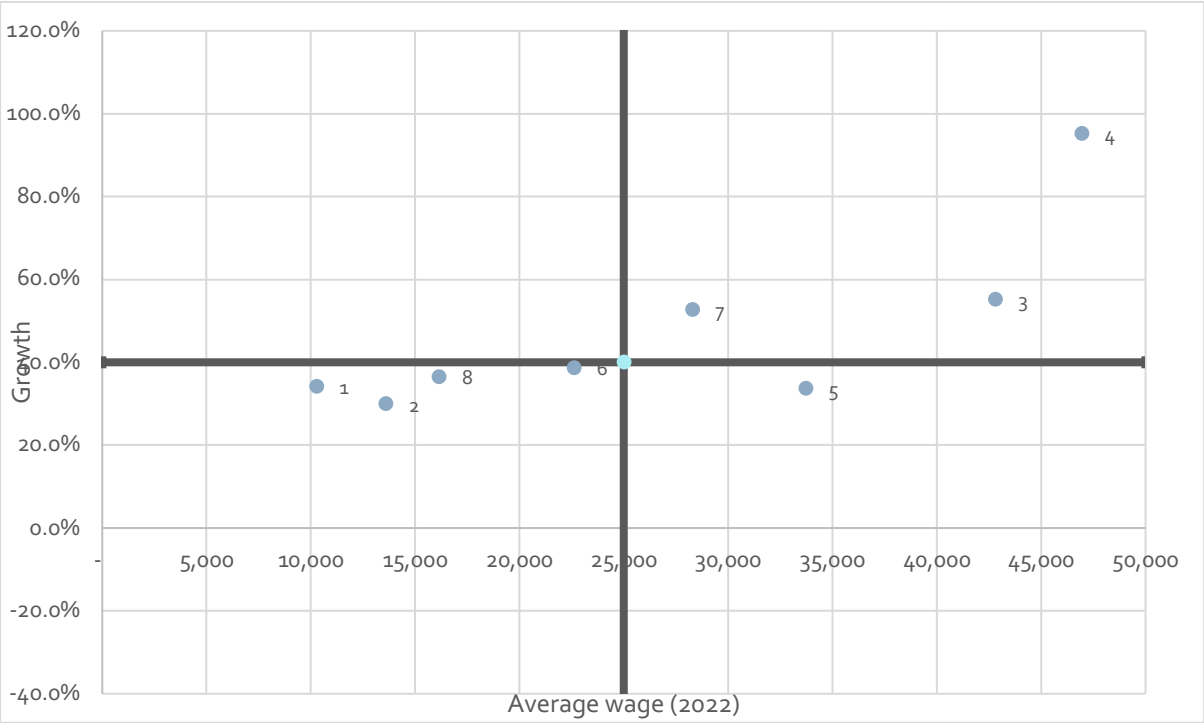

FIGURE 4.2.1 GROWTH BETWEEN 2012-2022 AND ACTUAL WAGES IN 2022 (SOURCE: NSO,2023)

4.3 Methods

For the purposes of this analysis, an econometric model has been designed, building on the work of other international studies within the literature (e.g., Stansbury and Summers, 2017; EPI, 2022). A schematic of the model is presented in Figure 4.3.1 below:

FIGURE 4.3.1 GRAPHICAL REPRESENTATION OF REGRESSION MODEL USED IN THIS CHAPTER

A brief description of each of the key variables used in this model, together with their data sources, is provided in Table 4.3.1. The explanatory variables included in the model have been derived from the literature on the determinants of wages and salaries at the macro level (e.g., Kiss & van Herck, 2018; Caparros Ruiz et al., 2010; Zulfiu Alili et al, 2018; Inewke, 2015). A micro analysis of productivity and wages was not possible due to the lack of representative firm-level data across sectors in Malta. The idea behind having an expanded set of variables to explain movements in wages is to obtain a richer picture of sectoral wage dynamics in Malta based not solely on labour productivity but also additional important factors that are correlated with both productivity and wages. Econometrically, this approach is also preferable since it significantly reduces the likelihood of biased and unreliable model results.

TABLE 4.3.1 DESCRIPTION OF VARIABLES AND DATA SOURCES

Variable Name	Description	Data Source
Wages and salaries	Aggregate wages and salaries expressed as a proportion of the total workforce in each sector	NSO (2023)
Productivity	Nominal Gross Value Added as a proportion of the total workforce (headcount) in each sector	NSO (2023)
R&D	Business expenditure on research and development	NSO (2023)
FDI	Foreign direct investment	Eurostat (2023)
Domestic Investment	Gross fixed capital formation	Eurostat (2023)
Tertiary education	Proportion of workers within each sector with a tertiary level of education (including vocational training)	NSO (2023)
Foreign workers	Proportion of foreign workers within each sector	NSO (2023)

The above model will be estimated on an annual basis, over the period 2012 to 2022, for the following sectors:

- Manufacturing
- Construction
- Financial and Insurance Activities
- Gaming (NACE R90-R92)
- Information and Communication Technology
- Professional, Scientific and Technical Activities
- Accommodation and Food Services
- Wholesale and Retail

These are the same sectors covered in last year's edition of the National Productivity Board Report. The focus on these specific sectors is not only for consistency reasons but also because they are considered as the more important sectors of the economy and the ones upon which Malta's economic growth model is built upon. We anticipate that such sectors will remain the key drivers of the Maltese economy in the coming years. The sole omission is real estate due to data reliability issues in relation to the key variables listed in Table 1.

The regression model has been estimated using two complementary yet separate panel data estimation techniques to ensure both the robustness of the results as well as to address a variety of potential issues inherent in such models, and which may compromise the reliability of the findings. In the first instance, we have estimated a Fixed Effects model that controls for a wide variety of sector-specific factors and impacts which do not vary over time, and which have not been captured by the other explanatory variables specified earlier. In the second instance, we have estimated a Hausman Taylor "mixed effects" model that employs an instrumental variables approach that allows us to account for potential endogeneity issues with our model, including the potential omission of important explanatory variables from the model as well as reverse causality between labour productivity and wages, since both variables may impact each other. In both estimation techniques, we have also included a

cyclical component derived from sectoral Gross Value Added to control for business cycle movements in our variables.

Technical details regarding the methodology, including more detailed representations of the results obtained, are provided separately to this chapter in Annex 4.

4.4 Salient Findings

This section presents the key findings emanating from the quantitative model described earlier. The results shall be described in a qualitative manner in order to improve accessibility, while also facilitating a broader discussion on their implications for the Maltese economy, both on an aggregate and sectoral level.

Labour productivity is positively and significantly correlated with wages and salaries across the key sectors of the Maltese economy under consideration. Indeed, the results indicate that a €1 increase in productivity translates to a €0.2-0.5 increase in average wages and salaries per worker in Malta, indicating that although the relationship is indeed positive, the strength of this association is lukewarm. In fact, this relationship is somewhat weaker than that estimated for the entire EU-28 by Pasimeni (2018) which stood at €0.47-0.66. Hence, this result suggests that over the period under review, wages and salaries in Malta have been weakly linked to labour productivity, potentially reflecting the contrasting trajectories in productivity growth across different sectors of the Maltese economy over the last few years. Another potential reason is the prevalence of collective bargaining across the Maltese economy as a whole, with estimates indicating that the proportion of workers covered by some sort of collective bargaining agreement hovers in the region of 50.1% (OECD & AIAS, 2021). A further point is that measurement of productivity in the public sector where collective bargaining is prevalent is notoriously fraught with difficulties. This raises the question about the accuracy of productivity indicators as applied in public sector collective bargaining, and although this goes slightly beyond the scope of the current report, which is largely focused on the private sector, this nonetheless does spill over into wage setting and

collective bargaining discussions within the private sector, further dampening the wage-productivity relationship, since wage agreements set within the public sector would anchor expectations regarding wage negotiations within the private sector as a whole, irrespective of whether they are covered by collective agreements or not (e.g. Benassi and Vlandas, 2022).

The proportion of workers with a tertiary level of education is also positively and significantly associated with higher average wages and salaries in Malta. The size of this correlation is relatively small; a 1 percentage point increase in the proportion of workers with tertiary education is associated with a 0.53% increase in average wages per worker. It is important to note that these results are not a reflection of individual-level returns from education, since the data is sectoral; rather, these findings indicate that higher levels of education are important but not sufficient to generate higher wages, unless they are combined with other factors like higher productivity. It is also possible that this result reflects the presence of over-qualified workers in some sectors, which would then not translate to higher wages. Indeed, these findings closely mirror those obtained from other labour market studies undertaken in Malta in recent years. For example, the National Employee Skills Survey conducted by JobsPlus, the National Commission for Further and Higher Education and Malta Enterprise details how women in the Maltese labour force often have skills and capabilities that are under-utilised at the workplace, which therefore limits their ability to progress in their careers and earn salaries that are commensurate to such skills. Similarly, the National Statistics Office's seminal Malta Skills Survey for 2022 (NSO, 2022) found that 54.3% of workers in Malta are "vertically-mismatched", which means that the level of education of the person in employment does not correspond to the level of education required to perform their job (ILO, 2018), with the majority of this cohort being over-educated. Indeed, the overqualification rate in Malta, which measures the proportion of tertiary educated workers employed in low or medium skilled jobs, has increased significantly in recent years, from 12.4% in 2012 to 20.2% in 2021 (NSO, 2022).

The proportion of foreign workers within a sector is not correlated with per capita wages and salaries in Malta. Once again, these findings reflect a number of factors, namely that foreign workers are by no means a homogenous group and vary significantly in terms of their skills

and capabilities, and that other factors included in this model are better placed to explain any wage differences (e.g., labour productivity). This is amplified by the fact that while certain sectors may be characterised by a high proportion of low-skilled, low-wage foreign workers (e.g., accommodation and food services), others (e.g., gaming) have in recent years sought to attract higher skilled foreigners with higher wages, with both phenomena effectively cancelling each other out in the analysis since it is being conducted on the macro level. A lot has been said about the increasing presence of foreign workers in Malta. We are not surprised by this as well as the mix of skills ranging from low to high-skilled workers, with similar trends prevalent in other Member States of the EU. In recent times the discussion at the national level has been on attracting and retaining higher-skilled foreign workers to boost productivity and develop new innovative sectors within the economy, as reflected in the Digital Nomads policies and other incentives, although it is important to recognise that lower-skilled jobs especially in social care will continue to exist.

We observe a positive relationship between sectoral business expenditure on research and development and wages and salaries, implying that knowledge intensive sectors on average pay higher levels of compensation to their employees. The results indicate that a €1 increase in R&D spending per worker translates to a €4.40 increase in wages and salaries per worker, which underscores the importance of continuous investment in R&D not simply to boost competitiveness and innovation, but also to raise the living standards of workers. The relationship between R&D and wages is two-pronged. Firstly, in the short-run, increased R&D spending within a business creates the internal need for more researchers and technical skills, who would typically command higher than average salaries, thus increasing average wage expenditure within the enterprise. This tallies with seminal work in the field of innovation economics, which underscores the fact that R&D spending rewards scientists, researchers and other knowledge-intensive workers in terms of yielding higher wages and salaries (Goolsbee, 1998). In addition, a secondary more long-term impact is that as R&D expenditure bears a successful, innovative process/product or service of some kind, this boosts productivity and competitiveness within the business, yielding higher wages and salaries in line with this success. This reflects the conclusions derived from the 2022 vintage of the National Productivity Board Report, wherein the importance of continuous investment in R&D was

discussed at length by various stakeholders from the private and public sectors alike, with the emphasis being on ensuring long-term business survival and competitiveness, which in turn will also benefit workers and potentially lead to the creation of new high-value jobs. In particular, the report also highlighted the potential role of workplace innovation in boosting productivity and competitiveness, especially for SMEs, entailing incremental improvements to existing work practices or processes in order to deliver a higher-quality product or service, often based on informal learning or experience, and thus constituting a relatively lower-cost option than fully-fledged R&D projects.

By contrast, domestic investment in fixed assets is not correlated with wages and salaries across Maltese economic sectors. This result reflects the fact that in recent years, domestic investment has been relatively dispersed across various high- and low-income sectors, including financial services and ICT, but also manufacturing and accommodation and food services. Hence, this finding does not in any way suggest that domestic investment will not lead to improved wages and salaries for workers, but rather that this may depend on the nature of the investment undertaken. For example, over the period 2012 to 2022 the vast majority of gross fixed capital formation in Malta was aimed at physical assets like construction, machinery and transportation equipment, with comparatively-less on ICT systems and intellectual property, although expenditure on these assets is rising. This predominance of investment in physical assets is also reflected in the issue of bonds by locally based companies, with a significant proportion of these bonds intended for real estate, accommodation facilities for tourism or retail investments. In this regard, we stress the need for financial sector growth with bonds issue intended for the environmental sector or to support green technology investment in retail estate, accommodation etc. The first green bonds were issued in 2023; further issuance of such bonds should be encouraged.

Finally, foreign direct investment (FDI) per worker is positively and significantly related with wages and salaries, whereby a €1 increase in FDI per capita is associated with a €0.7 increase in wages and salaries. This captures the fact that in recent years the bulk of inward FDI in Malta has been within sectors with relatively high wages like financial services and insurance activities, although other sectors have also seen an increase including gaming. Thus, this result

further emphasises the importance of attracting FDI to Malta to boost economic activity and wages, and tallies with other European studies focusing on the wage premiums associated with foreign direct investment within sectors (Bircan, 2013).

4.5 Sectoral Decomposition

So far, much of the analysis has been conducted at the aggregate level, reflecting broad trends and correlations within the Maltese economy in recent years. Nonetheless, it is important to recognise the significant diversity of outcomes and realities within each economic sector that forms part of this analysis. Therefore, in this section we ask the question: To what extent do wages and salaries reflect changes in labour productivity across Malta's key economic sectors? Within the current economic context, this question is extremely relevant given the need to ensure that wage increases are matched by comparable growth in productivity in order to prevent a wage-price spiral that would further exacerbate inflation and lead to further price hikes. Therefore, the purpose of this analysis is to identify those sectors where wage increases in recent years have already been matched by productivity growth, and in turn those sectors where productivity has lagged behind wage growth.

We shall therefore use the model developed and estimated in the previous section to break down the wage-productivity relationship at the sectoral level. Specifically, our model allows us to estimate the average wages and salaries in each sector that would exist if they were completely determined by the level of labour productivity within that sector and its various related factors like educational attainment and R&D spending. We shall obtain these estimates of productivity-driven wages and compare them to actual wages and salaries within each sector. For the purposes of this analysis, we shall classify economic sectors under one of three groupings. The first category includes those sectors where average wages and salaries are below the levels of productivity-driven wages, which reflects a situation where productivity growth within these sectors has outpaced wage increases. The second category of sectors includes those where average wages and salaries are broadly equal to productivity-driven wages, signalling that in these sectors, over the period under consideration, wages and

productivity growth have largely been in line with each other. The third and final category includes those sectors where average wages and salaries are lower than productivity-driven wages, which implies that in recent years wage setting within these sectors has not necessarily reflected rising productivity levels.

The results are shown in Table 4.5.1, where each sector has been included under one of the three groupings described above, with the numbers in brackets denoting the extent to which actual wages are below or above productivity-driven wages. As seen below, the results show that three sectors, namely ICT, professional services and financial and insurance activities, have wages and salaries which are below those predicted by our productivity model. The results are perhaps unsurprising considering that over the period under review, these sectors experienced significant growth in terms of their productivity as well as their contribution to economic growth, as attested by the analysis conducted in previous chapters, with ICT in particular emerging as a key driver of Malta's economy even in the wake of the COVID-19 pandemic and subsequent efforts at digitalisation. Professional services include a wide array of business activities and services including legal and accounting services, consultancies, architecture, engineering, scientific, technical and R&D work and advertising. This sector therefore provides various support services to other sectors within the Maltese economy, including ICT, construction, gaming and financial services, and has thus grown in line with the general economic upswing experienced by the country over the period 2012 to 2022, with digitalisation also helping to fuel productivity growth. Financial and insurance activities have long been a mainstay of the Maltese economy, with significant growth experienced since 2012 across most of its activities, with a particular upswing observed with regards to private pensions and insurance activities over the last 4 years.

Therefore, the results indicate that for the three sectors falling under this first category, actual wages and salaries (despite already being above the national average in Malta) are lower than the wages that would exist if they were completely determined by the level of labour productivity and the other productivity-related variables within each sector. This suggests that productivity growth in these sectors has outpaced wage growth over the period under consideration and indicates that there is scope for wages and salaries within these sectors to

increase over the coming years, provided that productivity levels do not stagnate. Such increases would also assist in attracting new talent, both local and foreign, and potentially help to address the noted skills shortages within these sectors.

TABLE 4.5.1 SECTORAL CLASSIFICATION BASED ON PRODUCTIVITY AND WAGES

(1) Actual Wages Below Productivity-Driven Wages
ICT (-33%)
Professional Services (-15%)
Financial and Insurance Activities (-13%)
(2) Actual Wages Equal to Productivity-Driven Wages
Manufacturing
(3) Actual Wages Above Productivity-Driven Wages
Accommodation and Food Services (23%)
Gaming (19%)
Construction (12%)
Wholesale and Retail (11%)

Moving on to category 2, we find that manufacturing is the only sector in the Maltese economy where actual wages and salaries are broadly in line with productivity-driven wages, and thus reflecting the fact that wage increases over the period 2012 to 2022 have largely been in line with productivity growth. This underscores the significant investment in R&D undertaken within this sector over recent years, coupled with notable innovation gains, as reported in the 2022 edition of the National Productivity Board Report (accounting for 24.3% of total business R&D expenditure in Malta in 2022), as well as growing levels of labour productivity, which expanded by 21.2% between 2013 and 2022. In addition, manufacturing is one of the sectors where on average the level of educational attainment by employees working within this sector has increased over time. This shows that over the years the sector has transitioned from low-skilled to higher-skilled jobs, with commensurate levels of productivity growth, in line with greater digitalisation and automation within the sector. Thus,

these results can be interpreted as further justification for continued investment and upskilling within this sector, in line with the various funding and incentive schemes for such innovative and green investments launched by Malta Enterprise in recent years to assist in this regard.

The third category of sectors comprises accommodation and food services, gaming, construction and wholesale and retail. Based on the results obtained, in these sectors actual wages and salaries have on average been above the wages that would be present if they were completely determined by the level of labour productivity within each sector, and therefore reflecting the fact that over the time period under consideration, growth in wages have not been in line with productivity gains. Therefore, the results suggest that productivity levels within these sectors must be boosted further in the coming years, since within the current global economic context, stagnating productivity levels will have an impact on the sector's ability to compete, particularly as operating costs have risen due to inflationary pressures. Therefore, there is an urgent need to ensure that wage levels reflect productivity levels both at enterprise level and at the sectoral level, with significant downside economic risks if this does not occur, in terms of both competitiveness and ultimately long-term business survival.

The inclusion of gaming may at first glance appear somewhat surprising given its rapid growth as a key cog of the Maltese economy. However, as shown in Chapter 2 Table 1.3.1, between 2013 and 2022 labour productivity within the sector shrank by almost 37%, despite the fact that wages and salaries per worker increased by an average of 46% over the same time period. This decline was due to a relative abatement in the sector's growth towards the latter part of the 2013-2022 period, which had previously reached unprecedented heights in 2012-2015, coupled with a sizeable and consistent increase in employment over the entire period, which suggests that the previous levels of labour productivity were not sustainable and merely reflective of a time lag between growth and hiring of new workers. Hence, these results capture the realities of a sector that is maturing and stabilising towards its long-term equilibrium following years of rapid growth, while also continuing to face significant labour skills shortages, with a skills gap survey conducted within the industry in 2018 reporting that 68% of job vacancies remained unfilled (MGA, 2018). Indeed, it is likely that in recent years

wage increases within the sector have not been in line with productivity simply due to these skills shortages, reflecting attempts by enterprises within this sector to attract and retain talent.

As for accommodation and food services, the results reflect a sector that, in 2022, was still recovering from the immense ramifications of the COVID-19 pandemic, coupled with the success of the Maltese government's wage supplement scheme which meant that many firms did not lay off workers despite the decline in output. Nonetheless, the results indicate that these sectors must seek to boost productivity over the coming years in order to ensure competitiveness and boost long-term survival prospects. Indeed, various initiatives have been launched by the government in recent years to improve productivity levels within the tourism industry in Malta, such as the e-learning training scheme for tourism workers launched in the midst of the COVID-19 pandemic in May 2020 to improve digital skills within the sector, as well as the interest rate subsidy scheme launched by Malta Enterprise in January 2023 to assist in the refurbishment and upgrading of hotels, accommodation facilities and restaurants. This also indicates that this sector is one greatly impacted by labour market tightness.

The construction sector is the third sector included under this grouping, mainly as a result of a flat lining in productivity levels between 2012 and 2022 despite an approximately 30% increase in average wages and salaries. The sector is at a critical juncture of its economic development, since although it continues to record year-on-year growth, it is facing a number of important challenges including rising materials costs, growing environmental and social compliance requirements, with potential financing impacts as a result of ESG reporting requirements for banks and insurance entities as from 2025 due to the Corporate Sustainability Reporting Directive (CSRD), as well as increased health and safety scrutiny and skills shortages. The results from this analysis therefore point towards the need for increased investment in both physical and human capital over the coming years to boost productivity, with a particular focus on green investments, as well as an industry-wide drive towards more circular construction practices in an effort to reduce reliance on virgin raw materials, like for example the use of recycled aggregate generated from construction and demolition waste or other activities.

Wholesale and retail is the final sector included under this grouping, reflecting modest productivity gains over the period 2012 to 2022 coupled with a 37% increase in wages and salaries over this timeframe. This development is particularly critical given that in recent years, the sector (particularly retail) has faced significant competition from online retailers and websites from abroad; a trend that is only likely to increase further over the coming years, thus highlighting the need for the sector to improve its external competitiveness. Nonetheless, it is important to note that R&D expenditure within the sector has increased significantly over the last decade, recording the highest increase across all business sectors in Malta between 2010 and 2019, mainly in digital technologies. The results from this analysis suggest that further investment is required to ensure that the sector keeps up with international competition while boosting labour productivity, mainly to have digital technologies generate further efficiencies by delivering a higher output and using less labour inputs.

4.6 Challenges and Opportunities

The following arguments delves deeper into the specific challenges and opportunities that have emerged from the assessed relationship between wages and productivity in Malta as discussed above.

4.6.1 Productivity and wages

The current trajectory of labour productivity and wages in Malta stands in contrast to the prevailing trends observed in other European Union (EU) countries as indicated by a lower relationship between productivity increase and wage increase in Malta when compared to the EU average. This particular observation poses a multifaceted challenge for the Maltese economy, although it is important to note that this weaker relationship may be due to the richness of our estimated model relative to other countries. Nonetheless, at its core, this challenge is rooted in the intricate relationship between labour productivity and wages,

offering valuable insights into the potential for further wage growth, particularly in sectors acknowledged for their high productivity, such as Information and Communication Technology (ICT), Professional Services, Financial, and Insurance Activities.

In these high-productivity sectors, the ongoing innovation and productivity enhancements play a pivotal role in shaping wage levels and, by extension, the broader economic growth trajectory. As these sectors continue to forge ahead with technological advancements and operational efficiency improvements, the cumulative effect is a boost in wages that contributes significantly to overall economic expansion.

Adding another layer to this complex challenge is Malta's strong tradition of collective bargaining. Collective bargaining serves as a potent tool that can be harnessed to enhance the wage-productivity relationship. It is a lever that exerts a notable influence on wage dynamics, intricately interlinked with the trajectory of productivity growth. However, in a comparative context with other EU nations, Malta's high degree of centralised collective bargaining presents certain obstacles, potentially hindering the ideal wage-productivity correlation. Many collective bargaining agreements in Malta may lack the flexibility required to adapt to firm-specific needs and changing economic landscapes.

Nonetheless, the path forward offers promising opportunities for restructuring collective bargaining to align it more harmoniously with productivity objectives. Rather than an impediment, it can be transformed into a facilitative mechanism, contributing to self-regulation and fostering stability in the intricate relationship between workers and employers. This shift towards more flexible and adaptable collective bargaining structures holds the potential to usher in a new era of labour relations characterised by stability, industrial peace, and an efficient allocation of resources. This, in turn, augments motivation among the workforce and, ultimately, productivity.

In essence, the challenge of aligning Malta's labour productivity and wage trends with the rest of the EU countries is not insurmountable. It necessitates a strategic approach, one that recognises the unique strengths of high-productivity sectors while leveraging the power of

collective bargaining to harmonise the wage-productivity dynamic for a more prosperous and stable Maltese economy.[12]

4.6.2 Education and Wages

In the realm of education, the Labor Force Survey (LFS) for the second quarter of 2023 paints a revealing picture. The data from this survey indicates that merely 34.9% of those employed have reached the tertiary level of education, according to the National Statistics Office (NSO, 2023). This statistic alone invites a crucial examination of the dynamics at play within the labour market. One may reasonably argue that this trend could be a direct outcome of the current tight labour market conditions. Indeed, the unemployment rate for the same quarter, standing at a mere 2.5%, reflects a labour market where job seekers are presented with an elevated probability of finding employment, even if their qualifications or skillsets do not perfectly align with job requirements.

However, a deeper analysis of the report's findings uncovers a more intricate challenge. Despite the limited representation of graduates in the workforce, the report reveals that there is a notable scarcity of high-level job opportunities that would allow employees to effectively apply their acquired skills and knowledge. This scarcity of roles that match employees' advanced qualifications has profound implications on both wages and productivity within the labour market.

This situation often gives rise to wage stagnation, as employees may find themselves unable to progress in their roles or earn higher salaries commensurate with their qualifications and expertise. This wage stagnation, in turn, can contribute to a broader hindrance in overall wage growth within the economy.

Moreover, this predicament may prompt a phenomenon commonly referred to as a "brain drain." As individuals possessing advanced skills and qualifications seek more promising opportunities elsewhere, it creates a vacuum of talent in the local labour market, potentially

[12] 12 OECD (2019), Negotiating Our Way Up: Collective Bargaining in a Changing World of Work, OECD Publishing, Paris, https://doi.org/10.1787/1fd2da34-en.

leading to a deficit in highly skilled workers. Such an outcome is detrimental to the long-term health of the economy and its competitiveness.

In addition to the negative impact on wages and the potential brain drain, when employees are not effectively engaged in challenging roles that align with their qualifications, it can significantly diminish their overall productivity levels. A disengaged and underutilised workforce can be detrimental to the productivity and efficiency of businesses and the economy as a whole. All this also indicates that the incentive to invest in the enhancing of one skills is being eroded in present labour market conditions.

To address these pressing issues and chart a more promising course for the labour market, it is imperative to diversify high-productivity sectors and niches. A diversification strategy fosters economic resilience and innovation while addressing critical social and environmental challenges. One critical avenue to explore is the transition into greener industries and sustainable practices. This shift not only promotes environmental responsibility but also enhances the overall quality of life.

In conclusion, the intersection of education, employment, and the labour market presents a multifaceted challenge. It necessitates a strategic response that includes diversification into emerging sectors, the promotion of innovation, and the prioritisation of green and sustainable practices to ensure a vibrant and resilient economy that can meet the evolving socio-economic needs of the future.

4.6.3 Foreign workers and wages

The influx of foreign workers into Malta introduces a dynamic interplay of challenges and opportunities that significantly impact both productivity and wages within the local labour market. This complex scenario necessitates a wide examination to better understand the implications.

One of the foremost opportunities presented by the presence of foreign workers is the potential to attract highly skilled individuals. Often, these foreign workers come equipped with specialised skills and expertise that are in high demand, particularly in certain highly productive sectors. Their arrival injects fresh talent into the workforce, enabling the adoption of new knowledge, techniques, and best practices that can lead to increased operational efficiency and productivity. As a result, these highly skilled foreign workers act as catalysts for innovation within their respective fields. Their diverse backgrounds, international experiences, and unique approaches to problem-solving contribute to a culture of innovation in the workplace, thereby enhancing overall productivity.

Moreover, skilled foreign workers offer a mentoring opportunity for local employees. Through knowledge transfer, these foreign experts can impart valuable skills and insights to the domestic workforce, which not only broadens the capabilities of local employees but also bolsters their productivity. This mentorship dynamic can be instrumental in upskilling the domestic workforce and equipping them with the competencies required to excel in their roles, ultimately contributing to heightened productivity levels.

However, amidst these opportunities, certain challenges arise with the current approach to attracting and retaining foreign workers. Notably, a substantial proportion of these foreign workers appears to stay in Malta for relatively short durations. This short-term tenure often does not allow sufficient time for these individuals to fully integrate into the local labour market or adapt to the specific needs of their jobs. Consequently, their productivity and efficiency may not reach their full potential.

This challenge is multifaceted. Firstly, the initial period of adaptation and acclimatisation for foreign workers can consume valuable time, during which they may not operate at peak productivity. Secondly, the frequent turnover of foreign workers can disrupt workplace continuity and impede the establishment of long-term collaborative relationships. Furthermore, the short-term nature of their stay may discourage some organisations from making significant investments in their training and development.

To maximise the benefits while mitigating the challenges associated with foreign workers, it is essential to devise strategies that encourage longer-term commitments and a more seamless integration into the local labour market. This could involve implementing initiatives to foster a sense of belonging, investing in onboarding and integration programs, and ensuring that foreign workers are given opportunities for career growth and development in Malta.

In conclusion, the presence of foreign workers in Malta introduces a complex and dynamic of opportunities and challenges. Leveraging the specialised skills, knowledge, and innovative potential of these skilled individuals can significantly enhance productivity and wage growth. However, to fully realise these benefits, it is vital to address the issue of short-term stays and facilitate their integration into the local labour market. This will ensure that foreign workers can contribute to their fullest potential and create a win-win scenario for both the local workforce and the overall economy.

4.6.4 FDI, R&D and wages

Foreign Direct Investment (FDI) introduces a range of challenges and opportunities to the Maltese economy, significantly shaping the dynamics of productivity and wages. The role of FDI in Malta is pivotal, and understanding its implications is crucial for a comprehensive economic analysis.

In terms of opportunities, FDI brings several significant benefits to Malta. One of the foremost advantages is the transfer of advanced technologies. FDI companies are often at the forefront of innovation, and their presence in Malta leads to the diffusion of these technologies within the local market. This technology transfer equips domestic businesses with the tools and knowledge required to enhance their operations and increase productivity. It fosters innovation, efficiency, and competitiveness.

Additionally, FDI typically involves substantial capital infusion into Malta's economy. This capital injection provides much-needed financial resources that can be directed towards research and development, infrastructure improvements, and business expansion. These funds have the potential to drive productivity and economic growth.

Another notable opportunity is the enhancement of skills within the local workforce. The demand for skilled labour by FDI companies encourages local workers to upgrade their skills and qualifications. This need, to meet high standards incentivises individuals to invest in their own professional development, ultimately raising the overall skill level of the local workforce. This, in turn, enhances the workforce's adaptability and contributes to increased productivity.

Furthermore, the presence of FDI companies offers local businesses the opportunity to access global markets. FDI companies are often well-connected internationally. Their networks and experience provide local companies with a platform to expand their operations and reach a broader international customer base. This access to global markets not only stimulates business growth but also encourages local companies to adopt international standards and practices, further enhancing productivity.

FDI also has a significant impact on wages, particularly for skilled workers. As FDI companies often operate in high-value sectors, they demand highly specialised and qualified employees. This demand can lead to higher wages, especially for those with specific expertise. These higher wages not only improve the living standards of the local workforce but also contribute to economic growth.

In addition to raising wages, FDI leads to job creation. The establishment of foreign companies in Malta results in the creation of employment opportunities for the local workforce. This not only reduces unemployment but also contributes to the economic growth and well-being of the population. Job creation is a fundamental driver of productivity and economic development.

However, there are challenges associated with attracting and maintaining FDI in Malta. One significant challenge is the perceived lack of diversified local skills. FDI companies often seek a workforce that is adaptable and versatile, capable of meeting their specific needs. If the local labour force is perceived to be too specialised or limited in its skill set, it may discourage potential FDI investments. To address this challenge, Malta needs to implement bold initiatives to diversify and enhance the local skills base, making it more appealing to a broader range of industries.

In conclusion, FDI plays a crucial role in shaping productivity and wages in Malta. The opportunities it offers, such as technology transfer, capital infusion, skills enhancement, access to global markets, higher wages, and job creation, are instrumental in driving economic growth. However, addressing the challenge of a potentially limited local skills pool is paramount to fully capitalise on the benefits of FDI and attract more investments to Malta. By fostering a diverse and adaptable workforce, Malta can position itself as an attractive destination for foreign investors, strengthening its economic development and resilience.

Chapter 5: Policy recommendations

5.1 Assessment of progress on past NPB recommendations associated with the area of Wages and Productivity

This section presents an assessment, based on expert judgement, of the recommendations put forward over the past NPB annual reports linked to the thematic area, which this year relates to the wages-productivity nexus.

5.1.1 2019 NPB Recommendations

> **Set up educational programmes to address the demand for new skills in highly productive sectors.**
>
> **Support human capital creation and improvement in low productivity services sectors exposed to international competition.**

These recommendations have important implications for both labour productivity and wages, particularly in those sectors that are currently experiencing significant labour shortages like financial and insurance activities, ICT, gaming, tourism and professional services. Since 2019, a number of important initiatives have been launched in this regard. As mentioned earlier, several schemes have been launched by government entities including Malta Enterprise to provide additional training and upskilling of employees, especially in relation to digital skills, which are now considered a must across all sectors of the Maltese economy. The NSO' National Skills Survey launched in 2022 also assisted in providing tangible information to feed into any current and future endeavours when it comes to the setting up of relevant educational and training programmes. In addition, in March 2023 the National Skills council was launched, with the aim to advance skill development, recognition and validation to foster a prosperous and resilient workforce in Malta. Inter alia, the University of Malta has sought to expand its educational remit by launching various awards and certificate programmes

targeting the needs and exigencies of the Maltese economy, including the launch of a postgraduate certificate in Environment, Social and Governance (ESG) catering specifically for the financial services sector.

> **Further encourage apprenticeships to ensure that young people especially low achievers have the opportunity to obtain the necessary qualifications, while applying the skills acquired in practice with the assistance of experts.**

This recommendation is aimed at improving the skills pool of the Maltese workforce, which is particularly important within the current context of skills shortages across multiple sectors. Various apprenticeship schemes have been launched in Malta via MCAST, as well as other initiatives like MITA's *Student* Placement Programme dealing specifically with ICT skills. Although progress has been registered more on the job training and apprenticeship on a larger scale need to be incentivised and implemented.

> **Introduce mechanisms which favour higher procyclicality of wages and salaries.**

This recommendation is very much in line with existing debate surrounding potential wage-price spirals, both in Malta and abroad, thus emphasising the importance of linking wage increases to productivity gains. Formal mechanisms as recommended in the 2019 report have, as yet, not been introduced locally.

5.1.2 2020 NPB Recommendations

> **Flexibility at work and availability of skilled labour must be improved so that the benefits of new technology, innovation and research and development can be more readily exploited.**

This recommendation is very much in line with the previous recommendations from the 2019 report, since it deals with the availability of labour and the need for flexibility to enhance workplace attractiveness. The COVID-19 pandemic has necessitated a more flexible approach to work, with remote working practices now commonplace across several private sector industries and businesses. The availability of workers continues to be a persistent issue for most sectors, with various initiatives related to training and upskilling of workers as well as the recently announced increase in stipends for STEM tertiary students aimed at boosting skill availability in critical sectors.

> **There needs to be an emphasis on sustainable productivity implying that businesses prepare for future risks by anticipating changes and adapting quickly and flexibly to these changes.**

This recommendation is rather a plea to businesses to incorporate forward-thinking and a risk management approach to their strategic business planning to anticipate risks/opportunities and allow for a clearer path towards adaptation or indeed exploitation of such opportunities. It is somewhat difficult to assess the extent to which this recommendation has been formally incorporated into business strategy. However, in certain sectors (e.g., financial and insurance activities) as well as in large publicly listed companies, EU Directives like the Corporate Sustainability Reporting Directive (CSRD) will, by their very nature, force a strategic, risk-based assessment of future risks since these businesses will be mandated to report on such risks.

The public sector should further recognise the strategic importance of research, development and innovation (RDI) and increase as well as intensify its expenditure in this area.

This recommendation recognises the critical role played by R&D in boosting productivity and ultimately wages and salaries. In the 2023 Budget, Government announced a €5 million programme titled Technology Extension Support with the participation of the private sector to fund projects with an emphasis on innovation. Similarly, new R&D funding opportunities have been launched by both Malta Enterprise and MCST in line with the National Research and Innovation Strategic Plan 2023-2027 which was published in December 2022.

5.1.3 2021 NPB Recommendations

Provide support to firms that upskill their existing employees through digital transformation courses, at all levels, including managerial-level capacity.

This recommendation represents one of several similar proposals related to digital skills, which are acknowledged to be essential across the Maltese economy both presently and in the future. As already stated earlier, various schemes have been launched to boost digital training and upskilling across several industries, including tourism, although specific assistance for managerial-level grades has not formally been launched, but would rather form part of existing broad schemes. However, beyond the present schemes higher incentives need to be provided as various employers get caught between the need of having its staff in productive activities and having them trained and upskilled.

Provide support to firms to develop technology-driven pilot projects such as automation processes, robotics, and artificial intelligence in collaboration with educational institutes that would also act as exemplars to other firms.

This recommendation touches on the importance of innovation as a driver of economic growth by boosting job creation and productivity. Several collaborative agreements exist between tertiary educational institutions in Malta and industry, including Postdoctoral Research schemes for industry and the Research Innovation and Development Trust at the University of Malta. Significant support is also being provided by Malta Enterprise and MCST in terms of funding and mentoring, while the Malta Digital Innovation Authority also seeks to provide support to the development of innovative technologies in Malta via direct assistance and sandboxes. One of the limitations we have not yet overcome is that various innovative ideas and projects which would have been analysed from a cost and economic benefit perspective, than fail to go the full distance to become commercially available.

> **Enhance the awareness surrounding digital transformation opportunities for specific sectors that are encountering challenges such as agricultural and construction.**

This recommendation aims at boosting digital investment in sectors where uptake has been low, and which may jeopardise current and future productivity levels. Once again, it is somewhat difficult to ascertain progress in this regard, although R&D levels in sectors like construction continues to be low relative to others.

5.1.4 2022 NPB Recommendations

> **More focus to be assigned to the role of workplace innovation.**

Workplace innovation was identified in the previous NPB report as a key potential driver of innovation and thus productivity improvements across various businesses, particularly SMEs who often lack the resources to partake in large-scale R&D. Thus far, no formal initiatives in this area have been undertaken by government, although since the publication of the 2022 report the role of workplace innovation in Malta has garnered considerable attention and is

likely to be investigated further in order to ascertain the extent of workplace innovation in Malta and the measures that can be developed to encourage its diffusion.

Shift from funding RDI projects to activities

This recommendation envisaged alternative forms of RDI funding via tax credit schemes for eligible pre-defined RDI expenditures, modelled on the system currently in place in the UK. So far, this proposal has not been taken up by the relevant authorities, with focus currently on increasing funding for RDI projects.

The public sector could act as an equity investor to promising start-ups.

This recommendation was primarily aimed at boosting both RDI expenditure in Malta via direct support of innovative businesses, as well as to promote FDI and domestic investment, all of which have positive spillover effects on productivity and wages. In September 2023, the Maltese government announced the creation of a €10 million venture capital scheme which will provide equity investment to promising technology start-ups in Malta across a variety of innovative sectors like ICT, video-gaming, pharmaceuticals, medical devices and FinTech.

5.2 2023 NPB Recommendations

This chapter section presents a detailed set of 10 recommendations pertinent to productivity and competitiveness in Malta, based on the analysis conducted in the previous chapter.

Recommendation 1: Prioritise Consolidation and Specialisation in High-Productivity Sectors

The primary recommendation emphasises the importance of consolidating and further developing Malta's key productivity sectors, particularly in light of the nation's economic dependency on foreign workers. These sectors include ICT, financial services, and professional services, as they have demonstrated their crucial role in driving economic growth. The skills content of the workforce in these sectors is superior to any other, making them a strong foundation for sustainable growth. Policymakers should prioritise measures that support the consolidation of these sectors, such as offering tax incentives and regulatory support to foster a thriving business environment. Collaboration among companies within these sectors should be encouraged to enhance global competitiveness and innovative capabilities. Moreover, it is essential to identify niche areas within these sectors for specialisation, enabling Malta to extract even higher long-term value and foster a workforce with superior skills, ultimately leading to sectors that provide a higher value added to the economy.

Recommendation 2: Strategically Attract and Develop New Economic Sectors

While recognising the importance of strengthening existing high-productivity sectors, there is also a need to strategically continue diversifying Malta's economy. This recommendation acknowledges the nation's reliance on foreign workers and the irreversible nature of this dependency. In this context, advocating for further investment in niche sectors within ICT and financial services is vital. These sectors not only provide superior skills content but also contribute to higher value-added to the economy. Therefore, policymakers should develop a

strategic plan for identifying and attracting industries that align with Malta's strengths and capabilities, ensuring the long-term economic benefits of diversification. Incentives and support programs should be tailored to facilitate the establishment and growth of these new sectors, expanding Malta's economic landscape while maintaining a focus on achieving higher productivity and innovation in these emerging areas. This approach aligns with the goal of focusing on sectors that offer a higher value added to the economy, supporting Malta's economic sustainability and future growth.

Recommendation 3: Enhance Manufacturing Productivity through Investment and Incentives

The third recommendation is centred around the manufacturing sector, which holds significant potential for increased productivity. To achieve this, it is crucial to encourage further investment in the sector, including Research and Development (R&D) and Foreign Direct Investment (FDI). These investments can drive technological advancements, process efficiencies, and product innovation, ultimately boosting the sector's productivity. Additionally, existing incentive schemes provided by Malta Enterprise, designed to improve efficiency and productivity within the manufacturing sector, have proven to be valuable tools. To maximise the sector's potential, these incentives should be strengthened further, creating a more supportive environment for manufacturing enterprises to thrive.

Recommendation 4: Promote Best Practices and Knowledge Sharing in Manufacturing

Building on the potential of the manufacturing sector, it is essential to recognise the success stories that already exist within this domain. This recommendation emphasises the need to replicate the achievements of successful enterprises, particularly focusing on how the integration of technology and human resources has resulted in increased productivity. To foster this, knowledge sharing and the adoption of best practices among manufacturing

companies should be promoted. By facilitating collaboration, information exchange, and mentorship programs, the sector can harness the collective expertise of successful enterprises to further enhance productivity and drive growth. This collaborative approach ensures that the manufacturing sector continues to thrive by leveraging the successful strategies that have already been demonstrated.

Recommendation 5: Elevate Skills and Working Conditions in Labor-Intensive Sectors

This recommendation is primarily focused on labour-intensive sectors, such as accommodation and food services, construction, and wholesale and retail, which heavily rely on foreign workers. These sectors are often characterised by subpar working conditions due to the nature of the work and its typically low skill content. To address these issues and enhance productivity, a twofold approach is suggested. First, the recent policy initiative to ensure that third-country nationals (TCNs) are adequately trained in the accommodation and food services sector should be extended to the other sectors within this category where such training is not already provided. This training initiative can significantly improve skill levels, boost productivity, and enhance the quality of work in these sectors. Second, raising living standards is essential. The positive correlation observed between educational outcomes and wages and salaries underscores the need for increased investment in education and skills development, ultimately leading to improved living standards for workers in these sectors.

Recommendation 6: Improve Productivity and Wages in Low-Skilled Jobs

Building upon the necessity to enhance productivity in low-skilled jobs, particularly in labour-intensive sectors, it is essential to acknowledge that measures to boost productivity are as vital as they are in sectors like manufacturing. Given the expected boost in incomes from the latest minimum wage agreement, it's imperative to ensure that this increase does not lead to an unsustainable wage spiral in the economy. Therefore, measures that aim to increase

productivity in low-skilled jobs are equally crucial. This recommendation underscores the importance of adopting strategies, such as vocational training, skill development, on the job training and workplace improvements, specifically designed for low-skilled roles. By focusing on the enhancement of productivity in these sectors, Malta can simultaneously elevate wages and living standards for workers in low-skilled jobs, ensuring sustainable economic growth.

Recommendation 7: Promote Widespread Investment in Research and Development (R&D)

This recommendation emphasises the significance of investment in research and development (R&D) across various sectors of the Maltese economy. R&D spending not only contributes to increased productivity and competitiveness, as previously highlighted in the National Productivity Board report, but also has a positive impact on wages and salaries, as corroborated by the findings presented in the previous chapter. To implement this recommendation effectively, it is imperative to ensure that R&D expenditure extends to all sectors of the Maltese economy. This widespread approach acknowledges the constant need for innovation and productivity improvement in diverse fields. Encouraging current schemes aimed at promoting and funding R&D spending in Malta is essential to further this goal. Furthermore, incentives should be designed to attract innovative start-ups to Malta, aligning with the recently announced government-backed venture capital scheme. By doing so, Malta can foster a culture of innovation, enhance productivity, and elevate living standards while addressing labour shortages.

Recommendation 8: Learn from Past Successes and Foster Innovation

Building upon the R&D investment recommendation, it is vital to recognise that the proposal aligns with the successful recommendations from the previous Productivity Report. This emphasises the importance of taking relevant recommendations on board. To expand on this, a distinct recommendation can be made to learn from past successes in the field of

productivity enhancement. By acknowledging and replicating successful strategies and practices that have proven effective in previous reports, Malta can foster a culture of continuous improvement and innovation. Such an approach ensures that the lessons learned and the accomplishments from previous reports are integrated into current and future strategies. This not only serves to strengthen productivity but also reinforces Malta's commitment to implementing actionable recommendations for economic growth and prosperity.

Recommendation 9: Fine tuning Malta's economic growth model

This recommendation is centred around the ongoing debate on Malta's economic growth model. It acknowledges that the country's economic growth heavily relies on the sectors covered in the study, particularly those with high productivity levels. When advocating for a change in Malta's economic growth model, the focus should be on consolidating and further strengthening the existing highly productive sectors. This entails implementing strategies and policies to encourage the growth and competitiveness of these sectors, which include ICT, financial services, and professional services. To achieve this, Malta should continue to attract Foreign Direct Investment (FDI) in sectors such as manufacturing, which can complement the existing strengths of the economy. Furthermore, substantial investment in human resource development is crucial, particularly in low-productivity sectors identified in the study. This approach ensures that Malta maintains its economic strengths while addressing key overarching issues related to sustainability and Environmental, Social, and Governance (ESG) principles.

Recommendation 10: Embrace Social Partner Involvement and Collective Bargaining

Recognising the importance of actively involving social partners in decisions impacting the economic growth model, this recommendation underscores the need for collaboration and

collective action. Social partners, including labour unions and employer associations, should play a critical role in shaping policies that promote productivity and align with the recommendations outlined in this report. Their involvement can help drive positive change in the economic growth model by supporting initiatives aimed at enhancing productivity and fostering economic development. In addition, the instrument of collective bargaining should be utilised to facilitate and support these changes. It is essential to leverage collective bargaining to create stability in labour relations, align with the recommendations presented in this report, and promote efficient resource allocation. The active engagement of social partners and the use of collective bargaining as an instrument for change can significantly contribute to Malta's economic growth and productivity enhancement while ensuring a fair and inclusive approach to economic development.

5.2.1 Recommendations by Implementation Priority and Key Stakeholders

This section categorises the recommendations put forward in this document by implementation priority on the basis of the authors' expert judgement, while also specifying the key stakeholders which are mostly associated with the implementation of each recommendation. High priority recommendations are those which, according to the authors, require immediate attention especially when taking into consideration the need to enhance productivity and competitiveness. Therefore, their implementation should ideally take place within a year. Medium priority recommendations might not require the same degree of immediate attention as those identified as high priority or may require longer than 1 year for implementation to commence in a practical manner since they may require further analysis or studies or may involve various administrative and financial challenges. It should be noted that they are still deemed to be of significant importance to the overall expansion of productivity and economic prosperity, and that such recommendations should ideally be implemented within the next two to three years. Low priority refers to the fact that while the recommendation is considered relevant, in contrast to the other recommendations, the authors are of the opinion that other initiatives might be considered more important, within the context of the current challenges faced by the Maltese economy to drive productivity forward and thus may be seen as having an implementation timeframe of between three to

five years. Table X presents the ratings provided based on high (red), medium (blue), and low (green) priority, and lists the key stakeholders who should be heavily involved with the implementation of each of the 10 recommendations presented in this report.

TABLE 5.2.1 CATEGORISATION OF RECOMMENDATIONS

Recommendation	**Implementation Priority**	**Key Stakeholder(s)**
1: Prioritise Consolidation and Specialisation in High-Productivity Sectors		Malta Enterprise; Ministry for Economy, EU Funds and Lands; Ministry for Environment, Energy and Enterprise
2: Strategically Attract and Develop New Economic Sectors		Malta Enterprise; Ministry for Economy, EU Funds and Lands; Ministry for Environment, Energy and Enterprise
3: Enhance Manufacturing Productivity through Investment and Incentives		Malta Enterprise; Ministry for Economy, EU Funds and Lands; Ministry for Environment, Energy and Enterprise
4: Promote Best Practices and Knowledge Sharing in Manufacturing		Malta Enterprise; University of Malta; MCAST; Trade Unions; Malta Chamber of Commerce; Chamber of SMEs
5: Elevate Skills and Working Conditions in Labour-Intensive Sectors		Skills Council Malta; MCAST; University of Malta; Trade Unions
6: Improve Productivity and Wages in Low-Skilled Jobs		Trade Unions; Malta Chamber of Commerce
7: Promote Widespread Investment in Research and Development (R&D)		MCST; Malta Enterprise; University of Malta; MCAST; Parliamentary Secretariat for Youth, Research and Innovation

8: Learn from Past Successes and Foster Innovation		MCST; Malta Enterprise; University of Malta; MCAST; Parliamentary Secretariat for Youth, Research and Innovation; Chamber of Commerce; Chamber of SMEs
9: Fine tuning Malta's economic growth model		OPM; Ministry of Finance and Employment, Ministry for Economy, EU Funds and Lands; MCESD
10: Embrace Social Partner Involvement and Collective Bargaining		MCESD; Trade Unions; Parliamentary Secretariat for Social Dialogue

Implementation Priority Rating	
High	
Medium	
Low	

Source: Authors' Own Contribution

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ANNEX 1

TABLE 5.2.1 EUROPEAN INNOVATION SCOREBOARD CATEGORIES AND SUBCATEGORIES

Category	Sub-categories		
Human resources	Doctorate graduates	Population with tertiary education	Lifelong learning
Attractive research systems	International scientific co-publications	Most cited publications	Foreign doctorate students
Digitalisation	Broadband penetration	People with above basic overall digital skills	
Finance and support	R&D expenditures in the public sector	Venture capital expenditures	Government support for business R&D
Firm investments	R&D expenditure in the business sector	Non-R&D Innovation expenditures	Innovation expenditures per employee
Use of information technologies	Enterprises providing ICT training	Employed ICT specialists	
Innovators	Product innovators (SMEs)	Business process innovators (SMEs)	
Linkages	Innovative SMEs collaborating with others	Public-private co-publications	Job-to-job mobility of HRST
Intellectual assets	PCT patent applications	Trademark applications	Design applications
Employment impacts	Employment in knowledge-intensive activities	Employment in innovative enterprises	
Sales impacts	Medium and high-tech goods exports	Knowledge-intensive services exports	Sales of innovative products
Environmental sustainability	Resource productivity	Air emissions by fine particulate matter	Environment-related technologies

ANNEX 2

TABLE 5.2.2 COUNTRY CODES

Country code	Country Name
AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	Czechia
DE	Germany
DK	Denmark
EE	Estonia
EL	Greece
ES	Spain
EU	European Union
FI	Finland
FR	France
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	Netherlands
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia

ANNEX 3

TABLE 5.2.3 DIGITAL ECONOMY AND SOCIETY INDEX

Dimension	Sub-dimension	Indicator
Human capital	Internet user skills	At least basic digital skills
		Above basic digital skills
	Advanced skills and development	At least basic digital content creation skills
		ICT specialists
		Female ICT specialists
		Enterprises providing ICT training
		ICT graduates
Connectivity	Fixed broadband take-up	At least 100 Mbps fixed take-up
		At least 1 Gbps take-up
	Fixed broadband coverage	Fast broadband (NGA) coverage
		Fixed Very High capacity Network (VHCN) coverage
	Mobile broadband	5g Spectrum
		5G coverage
		Mobile broadband take-up
		Broadband take-up
	Broadband prices	Broadband price index
	Digital intensity	SMEs with at least a basic level of digital intensity
Integration of digital technology	Digital technologies for businesses	Electronic information sharing
		Social media
		Big data
		Cloud
		AI
		ICT for environmental sustainability
		e-invoices
	e-Commerce	SMEs selling online
		e-Commerce turnover
		Selling online cross-border
Digital public services	e-Government	e-Government users
		Pre-filled forms
		Digital public services for citizens
		Digital public services for businesses
		Open data

ANNEX 4 – Econometric Model

In this annex, we provide further technical details regarding the econometric model developed and estimated in Chapter 4 of this report.

The general form of the panel data regression model estimated in this report can be specified as follows:

$$Wages_{it} = \beta_0 + \beta_1 Productivity_{it} + \beta_2 R\&D_{it} + \beta_3 FDI_{it} + \beta_4 Inv_{it} + \beta_5 Tertiary_{it} + \beta_6 Foreign_{it} + \beta_7 Cyclical_{it} + \alpha_i + \varepsilon_{it} \quad (1)$$

Where:

$Wages_{it}$ = Wages and salaries per worker in sector *i* at time *t*;

$Productivity_{it}$ = Gross value added per worker, in sector *i* at time *t*;

$R\&D_{it}$ = Research and development expenditure per worker in sector *i* at time *t*;

FDI_{it} = Foreign Direct Investment per worker, in sector *i* at time *t*;

Inv_{it} = Gross capital formation per worker, in sector *i* at time *t*;

$Tertiary_{it}$ = Proportion of workforce with a tertiary level of education, in sector *i* at time *t*;

$Foreign_{it}$ = Proportion of foreign workers in sector *i* at time *t*;

$Cyclical_{it}$ = Cyclical component[13] for sector *i* at time *t*;

α_i = Industry-specific fixed effects;

ε_{it} = Residual term.

Equation (1) was estimated using macro-level data for each of the aforementioned variables over the period 2012 to 2022, covering the sectors specified in Chapter 4. The somewhat exhaustive list of explanatory variables was included in the model to reduce the likelihood of endogeneity issues which may in turn result in biased results, particularly those related to the productivity-wages relationship, whose reliability is crucial for our analysis. Unquestionably,

[13] This was derived via the application of a Hodrick-Prescott filter to sectoral Gross Value Added, with the cyclical component retained as an additional explanatory variable in our panel data regression model.

the inclusion of these variables raises the potential spectre of multicollinearity but given that our goal is to conduct a sectoral-level analysis of predicted vs. actual wages, this was deemed to be acceptable given that our primary concern is reliability and given that multicollinearity does not in any way bias the regression results. For example, educational attainment is likely correlated with both labour productivity and wages, meaning that although its inclusion could potentially create multicollinearity issues, its omission would lead to even greater problems since it would effectively bias our results and render them unreliable. Furthermore, few of the regression coefficients obtained yielded functional signs that contradicted a priori expectations, thus limiting the potentially pernicious impacts of multicollinearity.

To ensure greater robustness, two complementary yet independent panel data estimation techniques were employed. The first technique is a Fixed Effects Model (FEM), which was selected on the basis of an adjusted Hausman test over a Random Effects Model. The FEM allows us to account for sector-specific, time-invariant factors which may have a significant impact on both the explanatory variables as well as our dependent variable of choice, namely wages and salaries. By explicitly controlling for such factors, we can improve the consistency of our regression estimates while reducing the likelihood of endogeneity, notably omitted variables bias.

The second estimation technique is a Hausman-Taylor Model (HTM), also known as a mixed effects model, since it seeks to combine the efficiency of a Random Effects Model while still accounting for unobserved individual heterogeneity across sectors. More importantly, the HTM can also be used to explicitly deal with specific endogeneity issues which may be present between labour productivity and wages and salaries, largely in terms of potential reverse causality. Although such reverse causality is largely a micro-level issue pertinent at the worker level, rather than at the macro sectoral level, it is still worth exploring this issue further and at attempting to mitigate its potential biases to ensure that our regression estimates are as reliable and consistent as possible. To this end, we employ time-invariant, sector-specific factors as an instrument within the HTM framework to deal with the endogeneity issue.

In both cases, cluster-robust standard errors are employed to correct for cross-sectoral heteroskedasticity and serial correlation over time. In addition, we find no evidence of structural breaks or unit roots in any of our variables. The regression results are shown below in Table 5.2.4.

TABLE 5.2.4 REGRESSION RESULTS

Variables	**Coefficients – Fixed Effects Model**	**Coefficients – Hausman Taylor Model**
Labour Productivity	0.491***	0.100***
	(0.057)	(0.019)
R&D	4.005**	9.086***
	(1.522)	(2.539)
FDI	0.619***	1.243***
	(0.063)	(0.295)
Investment	-0.052	0.035
	(0.052)	(0.067)
Tertiary Education	118.117**	318.940***
	(31.572)	(70.554)
Foreign Workers	17.537	8.409
	(10.430)	(32.605)
Cyclical Component	-2.756*	-1.237
	(1.201)	(4.723)
R-Squared	0.962	-
Wald Statistic		89.11

Notes: Standard Errors are displayed in parentheses. ***denotes that the coefficient is statistically significant at the 1% level; **denotes that the coefficient is statistically significant at the 5% level; *denotes that the coefficient is statistically significant at the 10% level.